Project funded by the EUROPEAN UNION

REGIONE AUTÒNOMA DE SARDIGNA
REGIONE AUTONOMA DELLA SARDEGNA

Sustainable MED Cities

Integrated tools and methodologies for sustainable Mediterranean cities

D.5.3.2 Sustainable MED Cities Guide

This project has received funding from the European Union's ENI CBC Med Programme under Grant Contract C_B.4.3_0063

Project number:	C_B.4.3_0063
Project acronym:	Sustainable MED Cities
Project title:	Integrated tools and methodologies for sustainable Mediterranean cities
Call:	Capitalization project
Start date of project	1 October 2021
Duration	27 months

Deliverable ID	D5.3.2
Due date of deliverable	31/12/2023
Organisation leader for this deliverable	Government of Catalonia
Dissemination level	Public

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Document history

Version	Date	Revision Reason	Reviewer
01	16/10/2023	Draft	Partners
02	6/11/2023	Draft	Partners
03	27/11/2023	Draft	Partners
04	11/12/2023	Draft	Partners
05	15/12/2023	Final	Societat Orgànica

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1. Introduction and overview

1.1 Foreword

Making sustainability a norm in city environments is vital for aiding the necessary shift towards ecological and low-carbon practices. This shift aligns with the objectives outlined in the Objective 3 of the Mediterranean Strategy for Sustainable Development 2016-2025, the 2030 agenda and the Paris Agreement Paris Agreement. In 2023, the third Union for the Mediterranean Ministerial Conference on Sustainable Urban Development "Implementing the UfM Strategic Urban Action Plan" final declaration considered that the Mediterranean Assessment Report declared the Mediterranean region as one of the most severely hit by the effects of climate change, with urgent need for action, promoting an agenda to sustainable urban planning and regeneration. The primary focus of the Sustainable MED Cities project was to increase the capacity of municipalities to bolster sustainability, a crucial sector due to its significant impact on energy and resource efficiency policies. However, this domain is intricate, involving economic, technical, environmental, and social aspects and interconnected with other challenges like urban planning, mobility, energy autonomy, potable water availability, and waste collection. For that reason, Sustainable MED Cities capitalized the CESBA MED Method and Tools to the needs and priorities of South-East Mediterranean countries in a similar vein as the MedUrbanTools initiative.

Improving the Mediterranean's current building inventory for sustainability lacks a widespread framework for assessing environmental performance. Initiatives have emerged to bridge this gap, proposing diverse methods, tools, and indicators. However, these initiatives predominantly focus on individual buildings, overlooking substantial and cost-effective improvements achievable through groups of buildings and synergies at the city scale. The success seen in implementing energy and sustainability measures at a larger scale, like photovoltaic microgrids and water management communities, points to the effectiveness of approaching improvements at the neighbourhood and city levels to meet human needs on urban sustainability in both the social and environmental fronts.

In response to these challenges, Sustainable MED Cities adapted the CESBA MED deliverables for a standardized assessment framework and process for buildings, urban areas and extended to the city scale. This initiative was implemented across three South-East Mediterranean countries and entails nine technical outputs. Additionally, Sustainable MED Cities has refined the decision-making model and standardized metrics to enable a contextualised comparison of sustainability

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performance among Mediterranean buildings, neighbourhoods, and cities. This multifaceted approach aims to foster a holistic and integrated understanding of sustainability in the built environment, paving the way for transformative changes in the Mediterranean region.

1.2 Context and background

In the Mediterranean region, approximately two-thirds of the population resides in urban areas. Looking ahead to 2050, the United Nations Human Settlements Program anticipates a significant surge in urban populations, projecting around 170 million in countries along the northern shore and exceeding 300 million in the south and east. This projection gives rise to critical challenges, including the proliferation of slums and deficiencies in infrastructure and services such as waste collection, potable water, mobility, and health threats.

Addressing these challenges requires a pivotal role from cities. Consequently, there is a pressing need for a fresh, sustainable approach to spatial planning and management in Mediterranean urban centres, one that offers enduring solutions. The Sustainable MED Cities initiative seeks to meet this need by leveraging the insights gained from the Interreg MED project CESBA MED Sustainable MED Cities and the ENI CBC MED project Green Building. Through this collaboration, Mediterranean municipalities will gain access to numerous innovative tools and methodologies, enabling them to formulate effective policies, strategies, and action plans aligned with the Mediterranean Strategy for Sustainable Development 2016-2025. The initiative also includes the implementation of forward-thinking capacity-building programs to empower Mediterranean cities in driving urban regeneration.

A key aspect of curbing energy demand and CO_2 emissions in the Mediterranean is the acquisition of quantified data. Thus, the Sustainable MED Cities project delivered common tools and methodologies to define shared targets and measure overall progress in terms of sustainability in urban areas. This concerted effort is expected to enhance the capacity of local authorities to act towards a sustainable built environment. Furthermore, the initiative promotes the adoption of participatory and multi-level governance approaches, thereby bolstering the impact of policy instruments used by municipalities, such as urban plans, strategic plans, and building regulations. In essence, Sustainable MED Cities endeavours to usher in a transformative era for Mediterranean urban development, promoting sustainability and resilience in the face of growing urbanization.

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1.3 Who is it for and how to use this guide?

The SMC Guide plays a pivotal role within the SMC project, striving to ensure the accurate utilization of its tools and methodology by the primary target groups of sector agents, while also advocating for broader dissemination throughout the Mediterranean Area. This document serves as a methodological blueprint, streamlining the implementation of the SMC project's outcomes, thereby ensuring their long-term sustainability within policies, plans, and regulations aimed at enhancing sustainability in the built environment. Its overarching goal is to assist public administrations and other stakeholders in delineating the optimal sustainability retrofit concept scenario for small urban areas and buildings within the Mediterranean context.

The SMC Guide is designed for professionals and managers engaged in urban environmental issues (such as SME technicians, urban planners, public officials, etc.), as well as other stakeholders involved in urban studies and development (including academics, researchers, decision-makers, urban developers, etc.) who are interested in enhancing the sustainability of the built environment. This comprehensive document serves as a guide for readers to understand and utilize the SMC methodology and tools effectively, covering both technical and functional aspects.

The SMC guide serves as a valuable resource for the sustainable management of building stocks, aiding in the formulation, review, and assessment of public policies pertaining to the urban environment, and facilitating the integration of sustainability principles into urban design and planning processes. The SMC methodology and tools are versatile and applicable to both existing and new urban areas, covering all phases of the lifecycle and facilitating the planning of activities across the urban spectrum, from goal setting to outcome verification. As a comprehensive methodology, it presents an evaluation framework specifically tailored for assessing buildings within the context of their environment, at the neighbourhood and city scales. Nonetheless, when appropriately contextualized and supported by relevant information and data, it enables the measurement of sustainability performance at both the district and broader urban area levels.

1.4 Executive summary

Several projects and other public or commercial programs and initiatives have emerged in recent years, proposing different methods, tools, and indicators for building sustainability. However, these are mainly aimed at the building scale, which is not optimal for achieving significant and

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cost-effective improvements and, furthermore, does not fully exploit the potential synergies that building clusters could offer.

The implementation of energy and sustainability measures on a broader scale clearly demonstrates that the neighbourhood level is a more effective approach to scale results and ensure compliance with commitments on urban sustainability, energy, and climate change. Therefore, sustainability measures and their implementation at the district level allow for significant and cost-effective improvements compared to an approach based solely on the building scale.

The urban-scale approach allows addressing:

- Synergies between buildings and communities.
- Optimization of the use of energy, water, and other resources.
- Efficient use of renewable energy sources and cogeneration systems.
- Mobility and waste management.
- Economies of scale.

However, decision-making at the urban scale is often a challenge, given its high level of complexity, the large number of involved actors, the complexity of the value chain, and the number of variables at play (mobility and transportation, energy generation and consumption, water supply and consumption, waste generation, air quality, etc.).

SMC works on contextualization, meaning the adaptation of the assessment methodology and performance indicators to the specific conditions of each local context.

1.4.1 What is SMC?

The SMC project is the result of collaboration among 6 partners from 6 countries in the Mediterranean Region. In this region, two-thirds of the population live in urban areas, with further predictions of population growth. This phenomenon poses serious challenges: a growing number of informal settlements, inadequate infrastructure, and services (waste collection, drinking water, mobility, health threats).

Cities play a crucial role in addressing these challenges. That's why a new sustainable approach to planning and managing space in Mediterranean cities is needed, providing a long-term sustainable solution. Building on the Interreg MED CESBA MED: Sustainable Cities project and the ENI CBC MED Green Building project, Sustainable MED Cities equips Mediterranean municipalities with a system of innovative tools and methodologies to develop effective policies,

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strategies, and action plans in line with the Mediterranean Strategy for Sustainable Development 2016-2025.

1.4.2 Sustainable MED Cities Objective

Improving the capacity of public administration in the development, implementation, and monitoring of efficient measures, plans, and strategies to enhance the sustainability of cities, neighbourhoods, and buildings with a focus on energy efficiency and the promotion of participatory processes. To achieve this main objective, SMC achieved the following specific goals:

- **Strengthen the capacities of public administrations** by providing a transnational SMC methodology and a set of tools, stemming from the capitalization of various EU projects, capable of optimizing sustainability planning measures by combining building and urban scales.
- **Develop an innovative decision-making methodology** to support the definition and implementation of actions aimed at improving the sustainability of buildings in the context of their urban areas.
- **Transfer the SMC methodology and tools** through training courses, seminars, workshops, and publications.

The mission of SMC is to facilitate the dissemination and adoption of sustainable built environment principles among all stakeholders in the construction sector by employing harmonized assessment systems throughout the life cycle of the built environment. SMC serves as a meeting point between top-down and bottom-up methodological approaches. Beyond the mere assessment of sustainability in buildings and urban areas, it represents a journey towards establishing new standards for Mediterranean cities.

1.4.3 Contributions of SMC to build a sustainable urban environment

SMC helps public administrations strengthen their capacities through the development of an innovative decision-making model and affordable, operational solutions. The main contributions of the Sustainable MED Cities initiative are:

- Capitalization of existing knowledge: SMC leverages the results of previous projects, supporting the development of sustainability plans. It determines the criteria and evaluation methodology most suitable for the Mediterranean Region, especially focused on the built environment.

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- Decision-making process: SMC includes the necessary methodological development to determine, initiate, develop, evaluate, and make necessary corrections for processes of planning and urban renewal, new construction, or rehabilitation designed with ambitious and rigorous sustainability goals.

- Development of SMC Tools: Based on the evaluation of pilot project results, a general framework and various contextualized assessment SMC tools for sustainable buildings (SBTool), sustainable neighbourhoods (SNTool), and sustainable cities (SCTool), along with an application methodology, have been delivered. The tools are intended to support decision-makers in processes that combine building and urban scales.

- Development of the SMC Passport: A set of common criteria, indicators, and metrics have been identified to enable the comparison of performance achieved by buildings, urban areas, and cities in different Mediterranean regions with a unified way of presenting results.

- Development of a Training System: A training system has been developed, tested, and validated for the transfer of SMC tools and methodology to the main target groups. The training system is primarily aimed at tool users (technical profile) and decision-makers (political, management profile). The system includes programs, training materials, and an e-learning platform. The training material is developed in three languages: English, French and Arabic.

1.4.4 Learnings and Conclusions from the SMC

The SMC methodology and tools have been piloted and implemented in three pilot cases summarized in the previous introductory section. After reviewing the results of the application, several learnings and conclusions can be drawn:

- **Using harmonised assessment systems** fosters the reach of greater sustainability standards in the built environment. These systems facilitate the adequate measurement of sustainability performance, allowing regular monitoring and proper comparability of results against other scenarios and/or urban areas.

- **Having access to reliable data and information** is essential to adequately assess the sustainability performance of the urban environment. Ensuring regular access to data and information allows the adaption of good monitoring practices, resulting in better policy formulation and implementation.

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- **Using the neighbourhood scale is optimal** to reach significant and cost-effective sustainability improvements. Between the building and the district scales, neighbourhoods allow the full exploitation of the existing potential synergies between the different urban scales.

- **Each urban area has its own unique characteristics**. For this reason, it is important to use disaggregated data and information and assessment systems that can be well adapted to the specific contexts, needs and priorities of the areas to be assessed.

- **Consulting, discussing, and involving citizens in the assessment** of the built environment is key to ensure that local knowledge and priorities are adequately considered and integrated. This ensures an adequate adaptation of the assessment process to the local conditions.

- **Training processes are essential**, both for technical and political agents, to be able to develop urban-scale sustainability policies, plans, and actions that are effective and enduring over time.

2. Methods, tools, and resources

2.1 Three tools

The SBTool MED, SNTool MED and SCTool MED can be contextualized and adapted to any Mediterranean region and city. All of them are freely available to any public authority in the Mediterranean willing to develop its own sustainability assessment tool at the building and urban scale. The use of these tools contributes to the achievement of the objectives of the Mediterranean Strategy for Sustainable Development.

2.1.1 SBTool

SBTool MED is an assessment system for measuring the sustainability of Mediterranean buildings. It can be used by designers to support integrative design processes and by public authorities to establish verifiable performance targets in policies, programs, and action plans.

2.1.2 SNTool

SNTool MED is an assessment system for measuring the sustainability of neighbourhoods and small urban areas. It is a tool useful to support decision making processes for the development, implementation and monitoring of urban plans and action plans.

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2.1.3 SCTool

SCTool MED is an assessment system for measuring the sustainability of Mediterranean cities. It can be used by urban planners to support integrative planning processes and by public authorities to establish performance targets in policies, programs, and action plans. Any public authority can develop its own SCTool MED that will provide sustainability assessment results comparable and aggregable with the results of any other local version of the tool.

2.2 SMC Passport and KPIs

The Sustainable MED Cities provided an easy to use, harmonized methodology and open-source tools to support Mediterranean municipalities in the assessment, planning, and overall decision-making process for selecting the best sustainable renovation strategies that increase the quality of the built environment. The assessment method focuses on energy and GHGs emissions, and other environmental vectors like economic and social indicators. The tools are used to set common targets and to measure the overall progress in terms of key sustainability issues and decarbonization efforts at different scales. The common method and tools are available in different languages, with their assessment and rating approach contextualized to local needs and priorities.

The approach taken utilizes the CESBA MED system (CESBA MED Project – assessment systems) that was developed as a generic framework. It includes a list of sustainability indicators that cover all relevant themes, given that there is still no consensus on a specific number or types of indicators. In addition, some new indicators are included in the SMC versions of the tools to address the priorities of the new partner cities in the MENA region. The resulting comprehensive database includes different performance indicators from which to select the ones that meet local priorities and needs, or best fit the project intent.

2.2.1 SMC Passport

The sustainability score produced by SMC rating system is valid only for the specific geographical area, as it reflects the local priorities and construction practice. To be able to compare the sustainability performance between buildings, neighbourhoods, or cities in the different Mediterranean regions, it is necessary to use indicators expressed in absolute values instead of scores.

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This is the key principle of the SMC Passport, which provides the absolute values of the SMC Key Performance Indicators (KPIs). The Passport is available for: Buildings, Neighbourhoods, and Cities.

The Passport template is a graphical visualisation of the main information concerning the assessment and it includes two different pages. The first one contains general information as well as maps and significant images, to better represent the features of the analysis. The second page of the Passport contains the list of the Key Performance Indicators, together with their code, criterion, unit of measure and value.

SMC Certificate

In addition to the Passport, the testing activity also produces a Certificate. The document summarizes the scores achieved in each area of the assessment system, giving the final score of the sustainability. Scores are then illustrated using a tachometer with a graduated scale which goes from the -1 (negative performance) to the 5 points (best performance).

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

2.2.2 Key Performance Indicators (KPIs)

A minimum number of key performance indicators are defined and used to ensure that the core sustainability issues can be addressed in a satisfactory manner. The KPIs are defined and calculated following common standardized procedures. The results from the normative KPI calculations can then be used as a passport for comparing different buildings, neighbourhoods, and cities, on a common basis.

For more detailed information, see *Annex A: Key Performance Indicators*.

2.3 The SMC method

The main goal of the SMC Method is to provide a final concise score, which summarizes the overall performance of the selected area with respect to all criteria.

2.3.1 Step 1: Characterization

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

For each criterion, SBTool, SNTool and SCTool provides the description of an “Assessment Method” that specifies the calculation procedure.

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

2.3.2 Step 2: Normalization

In the second stage of the assessment process, a performance score is associated to the value or scenario of each indicator. This process is named “normalisation”. The indicators are normalised in the interval (-1, +5), where -1 corresponds to a negative performance and +5 to an excellent performance. The better the performance, the higher the normalised score.

The values of quantitative indicators are normalised through linear functions of two kinds: H.I.B. (High Is Better) and L.I.B. (Low is Better). Qualitative indicators are normalised using discrete values corresponding to the reference scenarios.

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

2.3.3 Step 3: Aggregation

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

The aggregation takes place in 3 phases:

1. **Aggregation through criteria**: the scores of the criteria in the same category are aggregated to calculate the score of each category.
2. **Aggregation though categories**: the scores of the categories in the same issue are aggregated to calculate the score of each issue.
3. **Aggregation through issues**: the scores of the issues are aggregated to calculate the overall sustainability score.

Through criteria

The main goal of aggregation through criteria is to provide a single normalised score for each category. This is computed for each category aggregating the normalised score of all criteria included in that category. Aggregation is performed by linear aggregation of scores through weights. These quantify the relative weight of each criterion in percentage with respect to all criteria in the same category.

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Through categories

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

Through issues

The scores of issues are aggregated to calculate the overall sustainability score of the building, neighbourhood, or city. The calculation consists in a linear aggregation of the scores of the issues included in the SBTool, SNTool, and SCTool.

2.4 Contextualisation

SBTool, SNTool and SCTool are a generic multicriteria sustainability assessment. Users need to adapt the corresponding tools to local conditions.

The result of the contextualisation process is a local version of SBTool, SNTool and SCTool, ready to be used for assessing the sustainability at building, neighbourhood, and city scale.

Objectives:

Develop a contextualised version of SBTool, SNTool and SCTool takes in account local priorities, history, climatic conditions, socio-economic conditions, and advancement state in relation to sustainability issues. The contextualisation process takes place in 3 steps:

1. Selection of criteria
2. Benchmarking
3. Weighting

2.4.1 Selection of the active criteria

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

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

Objectives:

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

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2.4.2 Benchmarking

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

Objectives:

Set the benchmarks for each criteria following the priority order:

1. National, regional laws.
2. National, regional, municipal regulations.
3. Technical standards (national or international).
4. Statistical data.
5. Scientific literature.
6. Local reference values.
7. Simulations.

The selection of benchmarks can be documented and justified.

2.4.3 Weighting

Consists in setting the weights at criterion, category, and issue level through the assignment of priorities. Priorities are set in relation to local policies and sustainability goals. The priority of criteria, categories and issues are context dependent.

The weighting process takes place in 3 steps:

1. Assignment of priority values to issues and weights calculation.
2. Assignment of priority values to categories and weights calculation.
3. Assignment of impact factors to criteria and weights calculation.

Weighing of issues

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

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Weighting of categories

To set the weight for category level, it is necessary to define a priority factor for each of them. The priority factor indicates the relevance of the category in relation to the context.

Weighting of criteria

To weight the criteria is necessary to assign an impact level to each assessment criterion. The weighting of criteria takes place in 2 steps. Firstly, users assign an impact level to each criterion. Step two consists of weighting each criterion in its category.

2.5 Decision-making methodology

This section describes a decision-making methodology, based on the use of the Sustainable MED Cities assessment system, to guide in finding the most effective sustainable retrofitting concept in urban projects regarding cost efficiency and the overall sustainability performance.

The decision-making methodology is intended to support the municipality from the early initiation of the project to the preparation of the retrofitting concept that will identify the optimal package of retrofit interventions to improve the sustainability of buildings and urban areas.

The decision-making methodology foresees the possibility to combine the study of a retrofitting for an urban area with the study of retrofitting concepts for single buildings located in the same urban area. This multi-scale approach makes possible to take the surrounding urban area into consideration when engaging a building retrofitting project opening the doors for new cost effective and efficient retrofitting options, as at the urban level the synergies effect between the buildings can be exploited resulting into a win-win situation for the urban area as whole and for its single buildings.

The decision-making methodology is articulated in 7 phases that are elaborated in the following sections:

1. Initiation.
2. Preparation.
3. Diagnosis.
4. Strategic definition.
5. Retrofit scenarios.
6. Decision making
7. Retrofit concept.

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2.5.1 Phase 1: Initiation

The initiation phase is a first step in the decision-making process to define the optimal retrofitting concept for urban and building scale projects. The objective is to select the urban area and the buildings for which the retrofitting concept will be defined, collect key information, and identify the stakeholders to involve and set the working group (SMC WG) responsible for the decision-making process.

Selection of the urban area and the buildings

As a first step, the municipality must select the urban area and the building(s) for which the retrofitting concept will be defined. The physical boundaries of the urban area must be clearly defined, using one or more of the following criteria:

- Geographical proximity.
- Property ownership / occupier.
- Social and Economic context.
- Legal /administrative boundary lines.
- Period of construction.
- Energy supply infrastructure.

After setting the physical boundaries of the urban area, the public buildings included in the retrofitting study shall be identified. The municipality shall provide the rationale behind the selection of the urban area and buildings that will be the objects of the decision-making process.

SMC Workshop Group

The SMC Workshop Group (SMC WG) is the group of experts appointed by the municipality that will manage the whole decision-making process. A coordinator of the WG shall be appointed. This person will be the main responsible for the deployment of the activities and will act as interface with the municipality.

Collection of data

The SMC Team shall collect the necessary data to describe the urban area and the building(s), providing the necessary information to start the decision-making process. The climatic profile shall also be described in detailed.

The Testing Protocol (Activity 5.2.1 Test Protocol, Deliverable available) specifies the information to collect in the Initiation phase.

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Stakeholders' identification

After having defined the physical boundaries of the urban area, the municipality shall identify the relevant stakeholders that can contribute to the study. The identification of the stakeholders can help to refine the sustainability goals and consider multiple approaches to reach them, as the municipality would be able to utilize the stakeholder's specialized knowledge during the study. Also, the early engagement of the stakeholders in the project would be helpful to reduce the risk of conflicts in the development of the retrofitting concept.

Typical stakeholders are:

- Municipality's departments and other local authorities (e.g., Building Control, Health & Safety, Green Areas, Mobility Management, Urban Planning)
- Experts (e.g., urban planners, energy managers, landscape designers, etc.)
- Utilities and service providers (e.g., energy, water, solid waste, etc.)
- Public Interest Groups (e.g., neighbours, residents' associations, business associations, sports and other local clubs and societies, neighbourhood watch, NGO's, politicians)
- External Parties (e.g., banks, funding agencies).

2.5.2 Phase 2: Preparation

The preparation phase is the beginning of the urban and building retrofitting concepts development. The preparation phase will provide the necessary information to create a sufficient working basis for the next phases.

SNTool and SBTool contextualisation

The first step of the preparation phase consists in the contextualization of the SBTool and SNTool generic frameworks (transnational version) to the local conditions and priorities, as previously explained in section *2.4. Contextualisation*.

It is recommended to carry out the selection of criteria and the weight assignment through a participatory approach, as foreseen by the Participatory Guarantee System (PGS) approach, involving the stakeholders identified.

Data sources identification

The assessment method associated to each indicator in SNTool and SBTool requires specific information and data. It is necessary to identify, preliminary to the assessment activities, the sources of this information.

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The identification of the sources of data can determine the exclusion of a criterion from the local versions of SBTool and SNTool. For instance, a criterion selected in the previous stage could be later excluded because during the identification of the source of information it has been verified that the data aren't available or are of poor quality.

The SMC WG shall define all needed data at building and urban level for the assessment activities. Potential data providers, data sources and most promising strategies must be identified to gather all the needed data.

The use of software tools (e.g. GIS, energy simulation, cloud-based applications) may accelerate the collection and processing of the data collection process significantly.

For instance, data sources may include:

- Municipal or regional departments (e.g., urban planning, energy, mobility, etc.)
- Public agencies (e.g., energy agencies, social housing agencies
- Statistical offices
- Building owners / tenants
- Certificates (e.g., energy performance, sustainability)
- Utilities (e.g., local operators, energy utilities, water utilities)
- Publicly accessible free source (e.g., Google Earth, Open Street Map)
- On-site inspection
- Databases (e.g., from R&D projects)

Assessment criteria and the weighting process

At the preparatory stage, stakeholders are at the centre-stage since it is here that the sustainability assessment tools are contextualised. The selection of the assessment criteria is a very important step in the process because it will determine which sustainability issues will be considered in the preparation of the retrofitting scenarios. Furthermore, the assignment of weights to criteria consists in a prioritization of the different sustainability subjects and should reflect the needs and expectations of the stakeholders. A PGS workshop must be organised to validate the selection of the assessment criteria and the weighting process.

2.5.3 Phase 3: Diagnosis

The aim of the diagnosis phase is to analyse the current state of the buildings and the urban area. The values of the indicator associated to the assessment criteria are compared against a benchmark (fixed in the Preparation phase) which allows evaluating the performance compared

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to an average value for the urban area or building type. Consequently, it is possible to identify the strengths and weaknesses of the urban area and buildings.

Establishing an understanding of current conditions can serve several purposes for decision makers. Specifically, it can allow to:

- Identify strengths and weaknesses as well as assets (such as hard infrastructure or intangible resources) that can be leveraged to support interventions.
- Identify interconnections, co-benefits, synergies, or trade-offs between city systems that can help guide efficient use of resources.
- Explore gaps in awareness and opportunities for action.

The objectives of the diagnosis are:

- To set the basis for the definition of the performance targets for the retrofitting project of the urban area and public buildings (next phase).
- To identify the strengths and key weaknesses of the whole urban area and public buildings in terms of sustainability.

A low indicator's value means that the results which the indicator addresses must be improved. By the end of the diagnosis, the current sustainability level of the urban area and buildings will be fully understood.

Assessing the current state of the urban area

The key-weaknesses analysis is based on the SNTool assessment's results, possibly complemented with a soft analysis based on occupant surveys and workshops.

The performance scores evaluated using SNTool represent the average performance of the urban area in the various sustainability issues Each criterion has been compared to the benchmark values which allow the municipality in a quick and efficient way to check which urban indicators perform weak and which ones are performing well. If a criterion shows a result above a certain performance threshold defined by the municipality, the criterion is not relevant for the weaknesses analysis as it already performs well. Based on the first analysis on urban level, the SMC Team can rank the criteria according to their reached performance.

The score associated to each criterion represent the actual level of performance of the urban area, using a scoring scale ranging from 0 (minimum acceptable performance) up to +5 (excellent (ideal) performance), where anything below minimum is scored with -1.

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Identification of the weaknesses in the urban area

On the base of the performance scores, it is possible to rank the criteria and identify the critical issues. To complement the SNTool evaluation, it is recommended to carry out a survey among the inhabitants of the urban area. The survey can be useful to identify the priorities of inhabitants and issues non quantifiable through the SNTool indicators. For instance, these can be occupant wishes concerning the design or amenities of the neighbourhood infrastructure (e.g., need for a new playground in the neighbourhood). To analyse the valuable feedback of the different occupants on these non-assessed key-weaknesses using SNTool, it is recommended to carry out a workshop by the municipality as part of the PGS approach (see D4.2.1 Participatory Guarantee Systems). Based on the results of the two-part key weaknesses identification (SNTool and survey) a summary shall be created showing the SNTool assessment results and concurrently the identified non-simulated weaknesses by the municipality.

Evaluation of the infrastructures' current state in the urban area

The analysis of the current state of the infrastructures is useful to understand the key weaknesses and to collect useful information for the next phases of the decision-making process. For example, the evaluation of the current state of the water infrastructure shall include aspects as:

- Sufficiency of the water provision in relation to the water demand.
- Drinking water quality.
- Availability and level of water treatment.
- Water losses due to deterioration of the water network.

Evaluation of the buildings' current state

The diagnosis phase at the building scale contains a two-part key-weaknesses analysis based on the SBTool as well as on occupant survey. Based on the performance of each SBTool's indicator against a benchmark, the key weaknesses of the building can be identified and ranked according to the indicators' results. Hence, it is possible to prioritize various aspects in the building retrofitting which show the weakest performance based on the indicators.

Once again there are several potential non-simulated weaknesses at the building scale, which cannot be measured or quantified by any indicator. The key weaknesses for the non-simulated aspects can be analysed based on the collected feedback from occupant's surveys and physical workshops in the preparation phase.

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Diagnosis summary report and SWOT analysis

At the end of the diagnosis phase, the SMC-WG develops a report that summarizes the main findings of the diagnosis phase. The report shall contain the following:

- Main findings of the diagnosis, including weaknesses at urban and building scale
- Recommendations on how to handle the weaknesses in the next phases of the decision-making process.

The report shall contain a SWOT analysis for the urban area, identifying the strengths, weaknesses, available opportunities, and possible threats. The SWOT 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.
Finally, the municipality can analyse the results and diagnose the implications.

Participatory methods in the diagnosis phase

From the perspective of an occupant and user participation, the diagnosis phase involves little engagement. The SMC WG will analyse the current state of the buildings and urban area against the benchmarks set during the preparation phase, taking account of information previously gathered from occupants and users. The result is a summary of the weaknesses identified at building and neighbourhood level, from both a technical and quality of life perspective. The most important interaction with occupants and users in this phase will therefore involve communicating to them the results of the diagnosis.

2.5.4 Phase 4: Strategic definition

The main goal of this phase if the definition of the main framework conditions for the later retrofitting design based on the results of the diagnosis phase. The strategic definition therefore serves as pointer for the later design phases by setting meaningful targets for the retrofitting project and by identifying the main constraints and restrictions which may limit the design.

Specifically, this phase allows to:

- Build a shared vision to support decision making.
- Drive improvement in performance by setting a baseline from which to assess change.

The strategic definition phase is articulated in two steps:

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- Setting sustainability targets.
- Setting constraints and restrictions.

In the first one, following the diagnosis' outcomes, the performance targets for the urban area and public buildings retrofitting projects are defined. In the second one, the constraints that could limit the range of possible retrofit strategies are identified.

Sustainability targets

Before starting to create a sustainability retrofitting scenario for the urban area and the buildings, it is necessary to define clear and measurable targets that should be achieved by the retrofitting concept. Targets must address all fields of sustainability like environment, economy, and social aspects.

In general, targets need to be S.M.A.R.T., which means:

- **Specific** – target must be clearly defined.
- **Measurable** – target must be quantifiable.
- **Attainable** – target must be realistic and achievable.
- **Relevant** – target relevant for sustainable urban districts and buildings.
- **Time-bound** – specify when the result(s) can be achieved.

To get a clear direction in which the sustainability retrofitting projects for the urban area and the buildings should be developed, targets must be measurable. In this step, SBTool and SNTool are used to set measurable sustainability targets at urban and building scale. In practice, for each assessment criteria it must be set a target score. Each target score will correspond to a target value of the indicator. For instance, regarding the diagnosis' outcomes, the SMC WG can set sustainability targets, in the form of a target score, for the low performing SNTool criteria.

The outcome of this step will be a table listing the sustainability targets in the form of target scores and target indicators' values in relation to the assessment criteria included in the contextualised versions of SBTool and SNTool.

Constraints and restrictions

Since each urban area and even each building in a neighbourhood is an individual case, many potential retrofitting technologies cannot be implemented due to constraints and restrictions in different fields. The main constraints that occur in district and building sustainability retrofitting projects can be defined and structured into the following categories:

- Legal constraints (e.g., Building Codes, Cultural Heritage Protection)

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- Technical constraints (e.g., Architecture, Systems)
- Financial constraints (e.g., Investment Cost, return of investment)
- Environmental constraints (e.g., Climatic conditions, urban morphology)
- Stakeholder based restrictions.

In this stage, the SMC WG must identify the existing constraints and their nature to proceed with the next steps in the decision-making process.

Participatory methods in the strategic definition phase

At the strategic definition stage, stakeholders again take the centre-stage since it is here that the framework conditions for the retrofit design and plans are defined based on the results of the diagnosis phase. A series of S.M.A.R.T. targets are set, and constraints and restrictions on the project identified. This needs to be done in conjunction with stakeholders. A Participatory Guarantee System workshop must be organised to validate the sustainability targets for the urban area and buildings.

2.5.5 Phase 5: Retrofitting scenarios

In this phase, the SMC WG develops alternative possible retrofitting scenarios for the urban area and the buildings, that fulfil the defined sustainability targets in the Strategic Definition phase. As it's often the case, the team might come up with several different scenarios, all of which fulfil the sustainability targets. All valid scenarios would then be assessed in the next phase to choose the optimal one.

Development of retrofitting scenarios

A scenario can be defined as a package of retrofitting interventions.

Interventions may comprise changes to a physical (or hard) asset, such as a new development, technological solution, or other built structure. They can also comprise a soft intervention, such as a process or policy that builds knowledge or empowers skills and leadership (e.g., training, capacity building, behaviour change, improved coordination between departments).

Interventions should promote a holistic, interconnected approach to urban functions and consider the urban area as a system, and they should aim to bridge entities through an inclusive process that acknowledges co-dependencies and interdependencies. This integrated approach can help new ideas emerge and bring together new opportunities for cross-sectoral innovation. It can maximize synergies, foster efficient use of resources, and build longevity by ensuring that

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stakeholders and co-owners are engaged and invested in the successful implementation of the effort.

To achieve the sustainability performance targets, alternative scenarios can be developed.

In this phase the SMC WG will develop alternative retrofitting scenarios for both the urban area and the buildings. It is important that the scenarios differentiate significantly among each other. Otherwise, it would not make sense to compare them in the decision-making phase by a value assessment. However, the final decision about the number and content of scenarios that are created and used is always carried by the SMC WG in cooperation with stakeholders. Each scenario is a package of different solutions to improve the sustainability of the urban area, considering that all buildings are connected to a global system.

A retrofitting scenario is composed of a variety of single interventions in different thematic fields. The main fields among others are energy, water, use of land, resources consumption, climate mitigation and adaptation, mobility, health, socio-cultural conditions.

The approach proposed by this methodology is to consider the energy issues as a top priority. Urban regeneration interventions in the field of energy retrofitting are influencing the other thematic urban regeneration fields. The energy interventions are the starting point in the preparation of a scenario. All non-energetic interventions will be then added and integrated in a unique vision.

To create a retrofitting scenario, the SMC WG shall proceed according to the following steps:

A. Selection and optimization of energy interventions at urban level.
B. Selection and optimization of energy interventions at building level.
C. Selection of non-energy related interventions (water, mobility, use of land, etc.).
D. Identification of business models and financing schemes.
E. Validation of the scenario.

Financing mechanisms

For each scenario, business models and financing mechanisms must be identified to evaluate which one could be the most suitable for a practical future implementation of the retrofitting interventions. The possible use of the following financing opportunities, but not limited to them, should be evaluated:

- Grants: may be available at all stages for feasibility studies, proposal development, capital investment and maintenance expenses. They offer a subsidy to the total costs but exist only

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because governments or other entities wish to see innovations develop that would otherwise not be economically attractive. They will usually only cover part of the costs.

- Loans: imply debts that must be repaid, with on-going interest charges. Banks or other financial institutions will lend funds, but with an additional cost (interest) that depends upon perceived risks.

- Loan guarantees: This is an ancillary financial product that can reduce the cost of debt finance. It involves another stakeholder to the project investment team, namely a loan guarantor.

- Energy Performance Contracting: Usually undertaken by an ESCO, through a contractual obligation to implement the energy savings initiatives in return for a flow of payments from the building owner or end-user.

- Co-Investment: There are several initiatives around the world whereby municipalities or energy utilities assume the capital cost of retrofitting and place the charge on the property, to be recovered through the regular property tax or utility bill assessment and collection.

- Embedded revenue contributions: Many countries now encourage residential, commercial, and industrial consumers to install solar, wind, biomass, micro-hydro, and other renewable sources of electricity generation to reduce consumption of grid supplied energy and for sale back to the local distribution company, or, in the case of larger industrial units, to the wholesale market.

- Tax benefits: Fiscal measures are an important class of support and can relate to a reduced rate of tax for the owners, properties and / or contracting organisations, as well as specific tax and VAT benefits on the various cost or revenue elements.

Participatory methods in the preparation of retrofit scenarios

Inputs and suggestions from inhabitants, occupants and stakeholders are a valuable contribution in the development of retrofitting interventions. Stakeholders can provide feedback considering their targets and expectations on the prioritization of interventions. A Participatory Guarantee Systems workshop shall be organised to exchange on the possible retrofitting strategies and scenarios.

2.5.6 Phase 6: Decision-making

The overall goal of this phase is to select the best scenario in terms of energy and cost efficiency as well as the overall sustainability among the ones created in the previous phase (5. Retrofit

Scenarios). Only the scenarios which have reached the sustainability targets (4. Strategic Definition) can be compared in the decision-making phase. The selected best scenario will then be developed in a retrofitting concept in the next phase (7. Retrofit concept) articulated in 2 steps:

- Assessment of scenarios.
- Ranking of scenarios.

Assessment of scenarios

Each scenario foresees a package of interventions to improve the sustainability of an urban area and one or more buildings belonging to it. In this stage, the main goal is to identify the scenario, among the ones developed in phase 5, that allows the urban area and the buildings to reach the higher level of sustainability. The following steps must be accomplished for each scenario:

- Identify the criteria in Tool(s) that are impacted by the retrofitting interventions.
- For those criteria, assuming the implementation of the interventions, the value of the indicators must be calculated and updated.
- The new Tool(s) overall score is updated.

The process described above allows to verify the potential level of sustainability reachable by the urban area and the buildings in relation to the interventions foreseen by each scenario.
For each scenario, the overall SNTool and SBTool scores take in account the sustainability priorities of the municipality and stakeholders. These ones have been “embedded” into the contextualised versions of SBTool and SNTool through the assignment of a weights to criteria, categories, and issues. At the end of the scenarios’ assessment process, the final output is the SBTool and the SNTool scores associated to each of them. At this point, it is possible to proceed with their ranking.

Ranking process

On the base of the scenarios’ assessment process, it is possible to proceed with their ranking to identify the optimal one. To rank a scenario, it is necessary to assign a sustainability global score aggregating the SBTool and SNTool scores trough a weighted sum.

The ranking process is articulated in four steps:

1. Assignment of a weight to determine the priority levels among the urban area and the buildings.
2. Assignment of a global sustainability score to a scenario.

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3. Ranking of scenarios according to their global sustainability scores.
4. Selection of the optimal scenario to be transformed in a retrofitting concept.

The overall score of each scenario is calculated as a weighted sum of the SNTool and SNTool scores. Once a global sustainability score has been assigned to all the scenarios, it is possible to proceed with their ranking.

To confirm the selection of a scenario as the optimal one, it is necessary to consider other 2 aspects:

- The potential financial mechanism to implement the scenario.
- The non-simulated aspects.

The final choice should combine the best scenario in terms of performance and financial sustainability. If a scenario may not have reached the top rank but has many advantages in terms of financial mechanisms that are not reflected by the global sustainability score, decision-makers need to bear these aspects in mind.

As the ranking result is based on a quantitative method also non-simulated aspects which cannot be described by the scores need to be considered in the final decision-making. Hence, an expert judgement needs to be made to assess the final ranking of the variants besides the global sustainability score. The scenario which has finally been identified as the best ranked one (quantitative and qualitative aspects) is transformed into a retrofitting concept in the next stage.

Participatory methods in decision-making

Occupant and user participation becomes critical once more at the decision-making stage, where a selection is made from among the scenarios previously generated. In all cases, feedback from occupants and users should be invited at this point, before a final decision is made on the best scenario. A key question is the level of influence over this decision they are to be afforded vis-à-vis other stakeholders. The views of occupants and users should carry a strong weight. After the SMC WG has ranked the variant design concepts, and assessed them for value, the results should be encapsulated in a summary report. This is then presented in a Participatory Guarantee System meeting.

2.5.7 Phase 7: Retrofit concept

In this phase, the SMC WG is required to detail the best scenario in a retrofitting concept. The retrofitting concept is a report containing the description of the interventions foreseen by the

scenario. The interventions are illustrated for the urban area and the building(s) and organised following the issues of the tools.

For each intervention the information to provide is:

- Description.
- Expected results.
- Activities/works to implement the intervention.
- Timescale.
- Budget estimation.
- Financial scheme.
- Responsible for the implementation.
- Partnerships.
- Reference stakeholders.
- Links with existing or future strategies, plans, programs.

The retrofitting concept shall be considered as the first step of an integrated urban planning and design process. It provides a solid basis to build a valid retrofitting project in the future.

3. Participatory Guarantee System

The common thread of the whole procedure is the importance to involve key stakeholders in the crucial moments of the Decision-Making process through participatory approaches referred throughout the document as Participatory Guarantee Systems (PGS).

The PGS approach would ensure a better social acceptance of projects, a better implementation, and a better image for local authorities. Intrinsic PGS goals are knowledge sharing, priorities contextualisation, collective support among stakeholders in an evolutive system aiming at spreading good practices and innovation among a community.

Participatory Guarantee Systems are locally focused. They provide quality assurance systems for particularly defined fields. PGS certify the quality of the end results based on the active participation of stakeholders, since they are built on a foundation of trust, social networks, and knowledge exchange. PGS are based on the direct participation of key stakeholders in:

- The choice and definition of the standards (e.g. in line with, or even more ambitious than existing regulatory standards).
- The development and implementation of certification procedures (e.g. by defining and monitoring mandatory process steps).

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- The certification decisions through peer review (e.g. by a PGS committee that includes various stakeholders).
- The Decision-Making process (considering the way, the approach functions and how decisions are made).

PGS are bottom-up allowing for more flexibility, reactivity, actual support of professionals, and the recognition of local circumstances and needs.

The principle behind the involvement of the stakeholders in those kinds of participative processes, is to discuss opinions and needs while finding a collective solution that suit them best concerning the key aspects addressed.

As a result, PGS bring people together to work on a common goal, which also leads to a better understanding of sustainable building culture and a better understanding among each other. The more people from different backgrounds and levels are working together, the better the fulfilment of sustainability goals will be. Combining the know-how of the members with different backgrounds and their experiences gained during the certification process, new knowledge and sound standards are created.

The 7 guiding principles of the PGS on sustainable built environment include:

1. **Participation** and active commitment of relevant stakeholders is a fundamental dynamic in the design and operation of a PGS.
2. **Dialogue:** all members participate in the governance of the assessment system.
3. **Vision:** Stakeholders (users, owners, investors, citizens, politicians, technicians, architects, urban planners, builders, local authorities) collectively support the PGS principles as core values and share a common vision for the definition of sustainable built environment.
4. **Transparency:** All stakeholders have open access to the available information. For example, commonly defined standards reflected in the assessment frameworks, criteria and indicators and information on the Decision-Making processes.
5. **Trust:** The trust integrity-based approach of the guarantee system is rooted in the idea that key stakeholders develop their shared vision which is collectively enhanced and reinforced through the PGS.

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6. **Learning:** Stakeholders are learning new skills and knowledge on an on-going basis, at different stages and through different means. To allow a steady learning process, a knowledge network between all PGS stakeholders of the PGS must be set up.
7. **Assurance:** All stakeholders encourage social control so that the set rules and regulations of the PGS are respected to reach the commonly set goals.

PGS and the Sustainable MED Cities Decision-Making

The SMC Decision-Making Methodology emphasizes that the process adopts a participatory approach to maximise the involvement of stakeholders in the preparation of the retrofit concept: the participatory approach follows exactly the PGS methodology.

Almost all phases that constitute the Decision-Making process foresee a participatory stage, closely related to the objective of the phase addressed. Only the first (initiation) and the final (retrofit concept) do not require this stage process. These participatory moments are fundamental to guarantee the transparency of the process, the active stakeholders' participation, and the dialogue, in the way to achieve a shared vision among multiple actors involved.

Participatory Moment 1: Preparation

The preparation phase of the Decision-Making is the beginning of developing the urban and building retrofitting concepts. The first step of the preparation phase consists of the work to contextualize the transnational version SBTool and SNTool generic frameworks to the local priorities.

The selection of the assessment criteria is a very important step in the process because it will determine which sustainability issues will be considered in the assessment of the existing conditions and the preparation of the retrofitting scenarios. In addition, the assignment of specific weights to all criteria reflects a prioritization of the different sustainability issues and should reflect the needs and expectations of the stakeholders. The contextualisation of the SBTool and SNTool needs to be done in collaboration with all the stakeholders. A PGS workshop must be organised to validate the selection of the assessment criteria and the weighting process.

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Participatory Moment 2: Diagnosis

The aim of the diagnosis phase is to analyse the current state of the buildings and the urban area, to identify their strengths and weaknesses. During this phase, it is recommended to carry out building audits and a conduct a survey among the residents of the urban area.

To analyse the findings and the results from the corresponding tools, it is recommended to carry out a workshop by the municipality as part of the PGS approach. During this workshop the citizens can express their opinion about the issues that need to be addressed and prioritize different problems.

Participatory Moment 3: Strategic Definition

At the strategic definition stage, stakeholders take centre-stage since it is here that the framework conditions for the retrofit design and plans are defined based on the results of the diagnosis phase.

A series of Specific-Measurable-Attainable-Relevant-Time based targets are set, and constraints and restrictions on the project identified. A PGS workshop must be organised to confirm the sustainability targets for the urban area and buildings.

Participatory Moment 4: Retrofit scenarios

The SMC WG develops possible alternatives for different retrofitting scenarios to be applied to the urban area and the buildings that fulfil the defined sustainability targets in the Strategic Definition phase.

Inputs and suggestions from area residents, building occupants and stakeholders are a valuable contribution in the development of possible retrofitting interventions. Stakeholders can provide feedback considering their targets and expectations on the prioritization of interventions.

A PGS workshop shall be organised to exchange information on the possible retrofitting strategies and scenarios.

Participatory Moment 5: Decision Making

The overall goal of this phase is to select among the scenarios created in the previous phase the best one in terms of energy efficiency as well as the overall sustainability.

The selected best scenario will then develop in a retrofitting concept in the next phase. Occupant and user participation becomes critical once more at the Decision-making stage, where a selection is made from among the scenarios previously generated. In all cases, feedback from building occupants and area residents should be collected during at this point, through a workshop or survey, before a final decision is made for selecting the best scenario.

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The results should be captured in a summary report. This information is then presented in a PGS meeting, starting the participatory approach at this crucial stage of the Decision-Making process.

PGS and Co-creation Labs

The Co-Creation Labs are the places where the participation process physically takes place, to develop the urban retrofit plans. These Co-Creation Labs are instrumental for collecting input, expectations, and other views on the different stages of the Decision-Making process, by all the concerned stakeholders.

3.1 Co-creation labs

Co-creation is the practice of collaborating with different stakeholders to guide the decision-making process while promoting a bottom-up approach. The event is coordinated by an experienced facilitator to motivate and engage participants with different backgrounds and offer their diverse insights. Therefore decision-makers can obtain a more interconnected perspective of what a retrofit scenario should include. Through structured discussion, brainstorming, co-creation workshops help to draw out ideas, risks, approaches, and clarity that can lead to better scenario designs and better outcomes during implementation.

How to facilitate a Co-Creation Lab?

Steps to structure the agenda for the co-creation lab:

1. Identify the objectives to be achieved.
2. Select the most appropriate activities to achieve the objectives: brainstorming, prioritization, role playing discussions, prototyping, mapping, among others.
3. Plan for a diverse attendance and create the participant list, with names, titles and organization based on the role of each stakeholder relevant for the project.
4. Identify a suitable location to carry out the co-creation lab. It should be accessible to all the stakeholders.
5. Prepare the necessary documents for the participants to be contextualised later.
6. Structure a Session-by-session plan, with topic, purpose, desired outcomes, time allotment, identify key-roles for facilitators or presenters, and participants, and distribute the necessary materials that can be used to develop the selected activities.

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7. Circulate the respective invitations to all participants to the co-creation lab with the location, time, and date details as well as the necessary documents for the participants to have access to all relevant information.

3.2 Local project committees

LPCs are the primary strategy for actively engaging target groups. Local members, representing the different sustainability stakeholders will compose the LPC and they will actively participate in this collective working group.

Role of Local Project Committees

The role of the LPC is to provide specific feedback on project activities, based on specific local priorities, which will help to properly achieve the results of the project and to elaborate the contents of the deliverables.

The objectives of the Local Project Committee meeting are to:

1. Foster the awareness of the project in the local contexts.
2. Provide feedback on the project's activities/ results.
3. Collect feedback from the involved stakeholders.
4. Engage potential end users in the project.
5. Support the dissemination and communication activities.
6. Support the exploitation of project's outcomes.

The LPC is established during the early stages of the project to collect feedback from local stakeholders involved and, consequently, provide advice and guidance for developing results that meet their needs and expectations.

The LPC main stages include:

1. Prepare an agenda with the general topics to be addressed during an informal collective meeting.
2. Identify who should be involved in the LPC.
3. The elaboration of the agenda with a recommended time-scheduling of the sessions is provided by an assigned task leader but stakeholders are free to extend or compress sessions in accordance with their needs/ requirements.
4. The preparation of the invitation to the LPC is recommended to properly inform stakeholders about the topics of the meeting.

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5. Stakeholders will prepare presentations or other kind of material useful to properly explain the topics addressed by the LPC.
6. LPCs can be organized both in the presence and in virtual modality. During the in presence LPC, it is recommended to promote dynamic discussion. Concerning the virtual modality implementation, it is recommended to foster methods for proactive interaction like questionnaires, quizzes, or surveys.
7. The assigned task leader provides Stakeholders with a Feedback Template to collect feedback arising from the LPC meetings.
8. Stakeholders must send to the Task Leader the filled Feedback Template within about 15 days. The outputs collected through the Feedback Templates will constitute the essential part of the Local Project Committee activity report [Deliverable D 4.4].

The main actions are captured by the following five keywords:

- **Inform**: one-way distribution of information.
- **Consult**: exchange information between citizens and politicians, administration.
- **Involve**: stakeholders contribute their opinions in the preparation of decisions.
- **Collaborate**: decisions made with the stakeholders.
- **Empower**: stakeholders involved in the basic participatory process.

Target Groups to involve in LPC activity

Potential stakeholders to can be involved in the LPCs include:

- Local authorities (e.g. Municipalities, Metropolitan areas)
- Regional and National authorities (e.g. Regions, Ministry levels)
- Associations of public authorities
- Professionals
- Qualification scheme operators
- Academic, training institutions
- Companies
- SMEs associations
- International Organisations.

Materials to perform the Local Project Committees

The reference material for the performing of the LPC includes:

- Agenda.
- Invitation.

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- Feedback Template.
- Presentation of the topic addressed during the LPC.

LPC meetings must be attractive to the participants to encourage interactive participation. Therefore, it is recommended to use methods that encourage proactive interaction taking advantage of various features from online meetings (as online questionnaire, quiz, etc.) and exploiting support material for in person meetings, like post-it, whiteboard and markers, interactive and participatory methods.

3.3 Collaborative platform

The SMC Collaborative Platform is the open-source online tool to engage with stakeholders in every phase of the decision-making process. A collaborative platform is an online digital tool to involve different types of stakeholders in every process where decisions need to be made. It serves governments, social groups, and other institutions to involve different types of stakeholders in all types and stages of participative processes. They are useful for:

- Community and stakeholder engagement.
- Deliberation and collective decision-making.
- Public communication.
- Monitoring and supervision of projects.

See D3.2.2 [Collaborative Platform] for detailed information of the process.

4. Training system

The SMC training system was designed to provide to the concerned target groups with the skills and knowledge needed to effectively use the methodology and tools developed and tested during the project, in particular:

- The **SMC assessment system**, a set of indicators for measuring the level of sustainability at different spatial scales (building, neighbourhood, city).
- The **SMC online assessment platform**, enabling users to generate contextualised assessments tools for any MED city.
- The **SMC decision-making methodology**, that enables the decision-makers to identify the most convenient retrofitting scenario at building, neighbourhood, and urban scale.

The SMC Training System is tailored for two specific main target groups:

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- **Technicians**: this group includes professionals, mainly architects and engineers, building designers, urban planners, SMEs technicians, public bodies' technical staff. All of them have a technical profile and need to learn how to use SMC assessment tools both in terms of technical and functional / operational aspects.
- **Decision-makers**: this group include policy makers, investors, developers, public bodies managers. They need to reinforce their capability to set up high quality energy retrofitting actions on public buildings or new construction projects and to step up their capacity to drive, using the SMC tools, the sustainable renovation of urban areas as part of effective urban development plans.

The SMC training system offers a complete set of training material, in 3 languages (English, French, Arabic) and asynchronous online courses for different types of users accessible through the SMC e-learning platform.

4.1 The components of the SMC training system

The SMC methodological approach

The SMC courses are based on methodologies requiring active involvement of the participants to maximize the learning outcomes and speed up the application of SMC tools.

The learning activities of SMC courses may include lectures and seminars (or webinars) as well as practical exercises using SMC tools, on site study visits, case studies analysis and open discussion sessions.

The SMC training courses are an opportunity to bring together all relevant local stakeholders related to development and implementation of sustainable urban plans.

The SMC training modules

SMC training material and courses have been developed using a modular approach to ensure maximum flexibility, usability, and personalization of training. Each course can be composed by one or more training modules. Six training modules form the basis of the SMC training system. Their contents are summarized below:

Module 1 - Generic Framework concept and multicriteria assessment methodology

This module presents the basic concept of sustainability in urban areas and assessment systems for the built environment. The 3 sets of indicators (at building, neighbourhood, and city scale)

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developed in the project, aimed specifically at the Mediterranean cities, are illustrated together with the contextualization process.

Content:

- Introduction to assessment systems for the built environment.
- Overview of the assessment process.
- General description of the criteria of the SBTool, SNTool and SCTool.
- General presentation of the contextualization process.

Module 2 - The SMC decision-making process

This module details the implementation of the decision- making process based on Sustainable MED Cities Tools, to set up high quality energy retrofitting/new construction projects as part of sustainable urban development plans.

Content:

- Model of decision-making process for sustainable buildings, neighbourhoods, and cities.
- The 7 steps for implementing the decision-making process.
- The online platforms supporting the decision-making process: the SMC assessment platform and the SMC collaborative platform.

Module 3 - Calculating the assessment criteria of SBTool - Building Scale

It presents the Key Performance Indicators (KPIs) of the Sustainable MED Cities (SMC) SBTool – Building Scale. The calculation method for each indicator is explained step by step and illustrated with an example.

Module 4 - Calculating the assessment criteria of SNTool - Neighbourhood Scale

It presents the KPIs of the SMC SNTool – Neighbourhood Scale. The calculation method for each indicator is explained step by step and illustrated with an example.

Module 5 - Calculating the assessment criteria of SCTool - City Scale

It presents the KPIs of the SMC SCTool – City Scale. The calculation method for each indicator is explained step by step and illustrated with an example.

Module 6 - Pilot Case Studies presentation

This module aims at presenting the pilot case studies developed by the three partner cities located in Jordan, Lebanon, and Tunisia to test the SMC methodology and tools on local

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neighbourhoods and buildings. The module content focuses both decision-making process and use of SMC tools. Content:

- Greater Irbid Municipality case study
- Moukhtara Municipality case study
- Sousse Municipality case study

4.2 The SMC training material

The SMC training material was developed in parallel with the development of the project. At the end of the pilot test activities, the training material was made available for "external" courses aimed at decision makers, technicians of municipalities and professionals to transfer the tools and methodologies developed in the project to other MED territories.

For each of the 6 training modules described in the previous section, different types of informative/training material have been developed. They include:

- Presentations in ppt/ pdf format
- Practical exercises and examples
- User's manuals for the SMC online tools
- Booklets
- Handouts.

A large part of the SMC training material is provided in 3 languages (English, French, Arabic).

The SMC training material can be consulted and downloaded from a shared folder.

All SMC training material has been developed to be "user friendly" and can be easily adopted both in online self-learning courses and in traditional "in person" courses.

4.3 The SMC e-learning platform

The SMC e-learning platform is an open-source website offering free access to training courses and materials for the two concerned SMC target groups: technical users and decision makers.

The SMC e-learning platform offers an easy-to-use learning interface. SMC online courses can be attended in an "asynchronous" mode: no timetables and calendars are fixed. This feature provides users with maximum flexibility and customization in taking the course. Furthermore, provides an "online help desk" service. The users can get answers to your questions or ask for further insights about the contents.

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The real added value of the SMC e-learning platform lies in the opportunities it offers in terms of continuous training even after the formal conclusion of the project to support a larger number of cities in the MED area in implementing innovative and sustainable urban renovation plans.

4.4 The SMC training courses experience

This chapter focuses on the description of the training activities implemented during the project duration. The implementation of these courses made it possible to achieve a dual purpose: on the one hand, to test and tune up the SMC training system components, on the other hand, to provide the necessary knowledge and skills to the pilot cities involved in testing the SMC tools and methodologies.

A specific project deliverable (D5.1.3 Training courses report) is devoted to a more detailed presentation of the courses implemented.

Training courses addressed to pilot cities

One of the main needs, which had already emerged during the implementation of the pilot case studies of the CESBA MED project, concerns the support that the partner cities deem indispensable during the test phase to apply appropriately in their local context the innovative tools and methodologies made available by the project.

This support must not only be preliminary to the start of the test but must support continuously all the implementation steps.

Designing further SMC training courses

The SMC training system is structured in such a way as to provide any interested training entity with a set of training components that will allow the design and delivery of courses aimed at illustrating and making known the SMC methodological approach and tools. The designing and delivering of further courses using the SMC training system components implies that the design of the course can be contextualized according to the specific needs of the territory and in relation to the learning outcomes to be reached by the users who will benefit from this training.

When a course programme devoted to a specific target group in a specific local context is designed, the course designer must consider specific needs and features of the target group and select the SMC training modules composing the course, together with the concerned training material, specifying modules sequencing constraints, course duration, and didactic methodologies to be applied.

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5. Pilot tests

As part of the SMC project, the partners undertook the development of pilot case tests, employing the project methodology and contextualising the generic tools for their local needs. This process involved collaboration with technicians and local stakeholders organized into local project committees, who assisted in selecting neighbourhoods and buildings and in contextualizing the tools.

In each project, an SMC Local Project Committee (LPC) was established, convening to advise the partners on activities and to provide necessary information on pilot cases. This committee comprised representatives from key target groups addressed by the project, such as public building stock managers/owners, local and regional authorities, and planners.

The LPCs were tasked with the following objectives:

- Bringing together experts and local authorities in sustainable neighbourhoods to facilitate the exchange of experiences and tools.
- Selecting a pilot urban area and buildings, defining mandatory and specific indicators for calculation, and determining their contextual weights within the tools.
- Identifying data sources, evaluating the SMC Tools, assessing decision-making processes, and suggesting possible enhancements and future directions.
- Conducting sustainability analyses of pilot areas and buildings to be presented in local training sessions, providing insights into the sustainability analysis process and the utility of conclusions.

The pilot cases tested in three locations (Sahloul, Sousse, Tunisia; Moukhtara Central District, Moukhtara, Lebanon; Al-Nozha, Irbid, Jordan) showcased the project results to local authorities and political leaders by:

- Offering technical support to others in the built environment sector.
- Introducing sustainability requirements for future public projects.
- Evaluating the readiness of projects seeking public funding.
- Monitoring progress towards targets and objectives.
- Facilitating clear communication of activities and progress to citizens.
- Utilizing the methodology, tools, and training materials for educational and research purposes.

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5.1 Sousse, Tunisia

Sahloul | Sousse, Tunisia

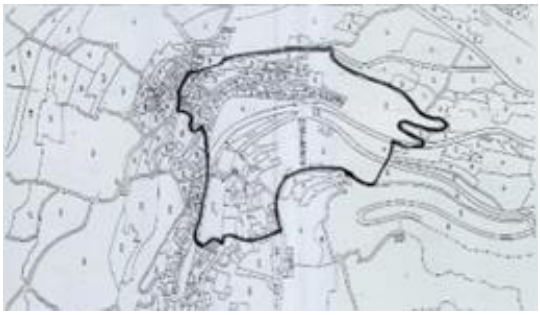
Eco-Quartier/ Integration of Green Technologies
The selected scenario is a combination of one scenario for the building scale (Integration of Green Technologies) and another for the urban scale (Eco-Quartier). It is the one that best corresponded to the mood of the decision makers and citizens of the neighbourhood.

Size
60.91 Hectares or 0.6 km^2
Residential population
5,809
Average building density
6.2 m^3/m^2
+ Info
SMC Sousse

5.2 Moukhtara, Lebanon

Moukhtara Central District | Moukhtara, Lebanon

Renewable Energy for Moukhtara village
The selected scenario combines the Renewable Energy for All (REFA) scenario for the SN Tool indicators adopted and the Moukhtara Municipality Greener (MMG) for the SB Tool indicators related to the municipality and club building.



Size
0.076 km^2
Residential population
150
Average building density
40,0000 m^2
+ Info
SMC Moukhtara

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5.3 Irbid, Jordan

Al-Nozha | Irbid, Jordan

SN Smart Energy – SB (A & B) Active

The selected scenario outlines several initiatives, including the use of land and biodiversity to increase energy storage and efficiency. Implementing renewable energy sources such as EV batteries, EV motors, solar PV, and battery storage will provide affordable access to energy and promote clean and renewable energy sources.

Size

0.96 km^2

Average building density

9.3 m^3/m^2

+ Info

SMC Irbid

5.4 Observations

Having conducted nine pilot tests of the methodology and tools within the SMC project across three distinct countries, the following observations emerge:

- **The methodology exhibits the capability to manage diverse scales**, offering flexibility to accommodate both small and large projects while considering the priorities of various users and adapting the scoring system accordingly.

- **The SMC Passport fosters comparability among different projects**, facilitating seamless integration.

- **National adaptations of indicators and tools are feasible**, not only in terms of language but primarily in terms of contextual adjustments (e.g., benchmarks) to align with local conditions.

- **Collaboration with local technicians is encouraged** to contextualize tools and engage citizens in public steps if the study transitions into an intervention project.

- **The methodology and the tools are available as open-source resources**, free for use, enabling their utilization for performance assessment of public projects and educational endeavours.

- **The SMC resources can streamline the efforts of municipal urban and building departments** in developing, updating, and testing sustainable action plans.

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6. Potential applications

6.1 SMC Policy Paper

This document provides a succinct overview of the key contents of the SMC Project and offers primary recommendations aimed at informing and influencing decision-makers, thereby contributing to well-informed policy discussions.

The recommendations of the policy paper of the SMC Project are:

R1 Ensure the mainstreaming of sustainability in urban planning and management.

R2 Promote the harmonization of assessment tools to measure, monitor and compare the sustainability of the urban environment.

R3 Make environmental, urban, and building data accessible to public administrations.

R4 Ensure the objectivity and measurability of the sustainability targets in regional and national policies, programs, and plans.

R5 Use sustainability assessment system to support integrated design and planning retrofit processes.

R6 Adopt participatory approaches to gather stakeholders' feedback [PGS – Co creation Labs – Collaborative Platform – LPCs]

R7 Improve the competencies of public authorities and professionals working in sustainable construction sectors.

The SMC Policy Paper is downloadable among other deliverables of the Sustainable MED Cities.

6.2 Potential applications of SMC

The SMC methodology and tools were devised to assess and enhance sustainability within the built environment. The SBTool, SNTool, and the SCTool, along with the corresponding SMC Passports, offer adaptable frameworks that can be utilized in either simplified or comprehensive formats, tailored to local conditions, objectives, and requirements across diverse urban areas. Their collective utilization is yielding valuable information regarding the status, reference benchmarks, and intervention strategies derived from real-world cases.

The range of potential applications is extensive, with the most significant ones categorized and outlined as follows:

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A. Building Design and Urban Planning:

This segment targets public administration technicians involved in urban planning, rehabilitation, and housing, particularly those overseeing urban renewal initiatives.

B. Dissemination of Best Practices:

Geared towards technicians, educators, researchers, and members of non-governmental organizations dedicated to studying and promoting sustainability in the building sector.

C. Economic and Fiscal Allocation:

These applications are designed to aid managers in economic, fiscal, financial, legal, and urban realms in devising instruments to promote urban actions guided by sustainability principles.

D. Training, Motivation, and Awareness:

The methodology, tools, and other resources from the SMC project hold utility in educational settings for technicians and students alike. Additionally, the information generated by the SMC tools can be leveraged in awareness campaigns, and heritage preservation initiatives.

E. Data Generation and Access, Regulatory Insights:

The ongoing utilization of SMC tools facilitates the collection of data on environmental, social, and economic evaluations and enhancements across buildings and neighbourhoods. This information can contribute to a database aimed at refining urban planning regulations, aiding decision-making processes in urban development, informing citizens, and establishing reference benchmarks.

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SMC POTENTIAL APPLICATIONS AND USEFULNESS	
A. Building design and urban planning	1. Evaluation of new and existing buildings and neighbourhoods and urban improvement policies 2. Exchanging information between different buildings, neighbourhoods, and cities
B. Visibility for good practices	3. Comparison and visibility of good practices on sustainability
C. Economic and fiscal allocation	4. A tool to support the implementation of public policies for sustainable urban development.
D. Training, motivation, awareness	5. Integration of sustainability in the urban planning technical process 6. Support for knowledge and awareness in the educational and social fields
E. Generation and access to information	7. Continued evaluation and follow-up of the status of buildings, neighbourhoods 8. Supporting participatory decision-making process in public initiatives

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1. Evaluation of new and existing buildings and neighbourhoods and urban improvement policies

Application description

As cities continue to expand, the planning and design of new neighbourhoods require consideration of economic, environmental, and social factors to meet sustainability goals. The adaptable nature of the SMC framework allows it to be tailored to different contexts and requirements, aiding in the definition of objectives, establishment of evaluation criteria, and verification of compliance with sustainability targets. Public administrations often face limitations in resources, both economic and technical, for renovating or developing the built environment.

Implementing ideas

Revise urban planning standards: In many cases, territorial and urban regulations lack sustainability criteria. Their inclusion requires consensus and institutional support to ensure continuity. Clearly articulate new sustainability requirements, indicators, objectives, and processes in regulations for new developments.

Set attainable goals: It's advisable to gradually introduce new sustainability requirements. One approach is to start with the use of indicators for informational purposes, gradually transitioning to goal fulfilment.

Implement real interventions: Execute pilot assessments, such as sustainability improvements to existing buildings or urban areas, to gain valuable visibility and experience for process enhancement.

Select a pilot or benchmark case: Beginning with a small-scale operation simplifies the implementation of new sustainable requirements, minimizing the risk of large-scale errors and building experience.

Train urban planning technicians: Incorporating new knowledge necessitates training for involved personnel, encompassing both specific topics and broader subjects.

Examples/references:

- SMC Decision-making methodology.
- Check the experience carried out during CESBA MED project.

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2. Exchanging information between different buildings, neighbourhoods, and cities

Application description

Assessing multiple buildings and neighbourhoods using a shared methodology, criteria, and indicators yields valuable insights individually. However, their collective analysis amplifies their significance.

By comparing various cases, identifying common challenges, and devising strategies to address recurring issues, sharing experiences and information becomes possible. This collaborative approach provides additional assistance in addressing common concerns.

Implementing ideas

Establish objectives and identify partners: Comparing buildings with both similarities and differences can offer valuable insights to expedite renovation and energy improvement processes. Collaboration with institutions providing information is essential.

Analyse available data: Property records, energy certifications, and technical building inspections serve as primary sources to compare and exchange data among different cases, fostering knowledge exchange.

Identify necessary services: Comparing similar cases, such as two houses with differing energy efficiency levels, enables the detection of disparities and suggests improvement measures.

Develop an information platform: Systematizing data collection and analysis facilitates the creation of standardized services, like comparing the quality of building enclosures. Increased data reliability leads to better outcomes.

Examples/references:

- SMC Assessment Platform.
- SMC Decision-making methodology.
- Testing activity carried out during the project.
- SMC Passport.
- Check the experience carried out during CESBA MED project.

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3. Comparison and visibility of good practices on sustainability

Application description

Comparing cases originating from diverse locations with varying climates, regulations, and usage patterns presents challenges, hindering information exchange and cross-learning experiences. However, it is feasible to overcome these obstacles by employing a system based on equivalences and commonalities shared by both cases. The SMC Passport enables the comparison of cases with diverse characteristics across different sites.
Promoting the implementation of evaluation and improvement processes in building and urban planning involves showcasing exemplary practices. Achieving this requires technical systems capable of evaluating improvements made, starting from a baseline condition, and comparing it against sustainability objectives. The SMC tools serve as valuable resources for identifying and highlighting good practices.

Implementing ideas

Identify the main indicators: Numerous economic, social, and environmental factors warrant evaluation, at each locality that has unique characteristics thus mandating the selection of additional indicators to address the specific local needs.

Tailor the evaluation framework: In addition to identifying relevant indicators, defining ranges and values deemed as local best practices is essential. Establishing interrelations among indicators facilitates comprehensive assessment.

Identify reference cases: Occasionally, exemplary building rehabilitation and urban renewal projects remain obscured. A targeted yet standardized search is required to uncover such reference cases.

Recognize and disseminate achievements: Acknowledging efforts in improving buildings and neighbourhoods through awards and dissemination initiatives fosters continuity and rewards individuals involved. Communication ensures knowledge sharing among stakeholders.

Examples/references

- SMC Platform.
- Testing activity carried out during the project.
- SMC Passport.
- Check the experience carried out also during CESBA MED project.

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4. A tool to support the implementation of public policies for sustainable urban development

Application description

Formulating public policies requires technical support to ensure that their definition addresses the needs arising from social and environmental crises. At times, there may be discrepancies between the initial intentions and the actual outcomes of these policies, resulting in unintended negative consequences. To mitigate this risk, evidence-based processes should be employed.

Utilizing the assessment and improvement tools provided by the SMC during the development and implementation of urban plans enables the selection of optimal alternatives with sustainable performance. Subsequently, monitoring these plans using predefined indicators allows for evaluation and, if needed, the implementation of corrective actions to ensure their effectiveness.

Implementing ideas

Support fiscal policies for sustainable development promotion: If it is desired to determine which activities or projects may merit a tax rebate or a financial subsidy, the objective way to establish and rank them according to their contribution to sustainability is through evaluation and comparison.

Select investment alternatives in infrastructure: There are usually more alternatives than can be financed or, even with sufficient financial resources, than can be implemented. They can be ranked and prioritised based on their evaluation and positive impact.

Grant financial aid for the renovation of buildings and urban areas: It is sometimes difficult to determine which projects do or do not deserve public financial support. However, verifiable requirements and benchmarks can be set by means of a technical evaluation of the criteria.

Define and evaluate of green purchasing and contracting policies: Public procurement of goods or services should follow sustainability improvement criteria. To avoid this being done in a piecemeal manner, comprehensive evaluation systems can be used to ensure positive impact and avoid possible overlaps and contradictions.

Examples/references

- SMC Assessment Platform.
- Check the experience carried out also during CESBA MED project.

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5. Integration of sustainability in the urban planning technical process

Application description

The formulation of urban planning policies, actions, and regulations must be grounded in sustainability objectives, methodologies, and indicators at both territorial and urban scales to ensure their contribution to environmental, social, and economic enhancement in an integrated manner. Moreover, this fosters the capacity-building of the technical bodies responsible for their development.

Merely incorporating sustainability assessment systems or utilizing sustainability indicators in the work of technical teams and decision-makers falls short in ensuring that urban planning responses align with the challenges posed by climate change and sustainability. Employing assessment systems to guide improvements can serve as a valuable tool.

Implementing ideas

Determine urban and territorial sustainability objectives: Assess neighbourhoods and cities chosen as representative references of the most common situations in the field of action, to obtain reliable diagnoses and determine ambitious but achievable objectives.

Evaluate and improve urban development plans and regulations: Apply assessment tools and decision-making processes based on sustainability vision both in the development of the new regulations and plans and in the improvement of the existing ones.

Train and educate technical teams: The training and educating activities of the technical teams of municipalities and regional governments is essential to be enable them to work with methodologies and sources of information on the sustainability of urban plans and regulations.

Detect and disseminate best practices in the sector: Promoting and recognizing the undertakings and entrepreneurs that make possible the processes of transformation and improvement of urban sustainability offers examples and references for upgrading projects in other areas and/or regions.

Examples/references

- SMC Assessment Platform.
- SMC Decision-making methodology.
- Check the experience carried out also during CESBA MED project.

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6. Support for knowledge and awareness in the educational and social fields

Application description

The development of tools and sources of information applicable to sustainability improvement processes at the urban and territorial scale require not only their application in government action but also their use, critical evaluation, and proposals for improvement by the teaching, research, and social communities.
The contribution that these communities can make is essential for the revision, adjustment and improvement of these methodologies and databases. Their use and dissemination are significantly expanded and, with this, the number of trained people who can be incorporated into neighbourhood and city planning processes also grows significantly.

Implementing ideas

Provide objective and useful information for public participation processes: The data available to citizens must be objective, clear, verifiable, and useful to be used in the evaluation and decision-making processes that take place in citizen consultations.

Create sources of information for teachers, researchers, and students: Information-based research and learning on the sustainability of buildings, neighbourhoods and cities is important for the development of projects, theses and publications that feed back into the system. Collaboration between university and public administration is essential for urban improvement.

Offer project evaluation and improvement tools for the academic field: Universities and other educational and research institutions do not usually have tools for assessing and improving the sustainability of buildings, neighbourhoods, and cities. The availability of these tools is important for the improvement of the projects they carry out, many of which are publicly accessible,

Receive opinions and suggestions from educational institutions: Providing tools and information to academic centres has its return in the knowledge contributions from these institutions.

Examples/references

- All the material realized to deepen the tools (SBTool manual, SNTool Manual, SCTool Manual, etc.)
- SMC Assessment Platform
- E-learning Platform
- Check experience carried out also during CESBA MED project.

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7. Continued evaluation and follow-up of the status of buildings, neighbourhoods

Application description

Enhancing the sustainability of buildings, neighbourhoods, and cities hinges upon the plans and actions implemented within them, as well as their subsequent follow-up, monitoring, and adaptation. This necessitates the use of a robust methodology alongside adequate, comprehensive, context-specific, and integrated sources of information.
The collection, processing, evaluation, and updating of data, as well as the refinement of information sources and tools utilized in urban improvement processes based on representative models, are vital for enabling real-time operations. Additionally, timely corrective and adjustment decisions are imperative to prevent discrepancies between project intentions and actual outcomes.

Implementing ideas

Support the decision-making process of government agents and politicians: The selection of projects to improve the sustainability of buildings and neighbourhoods can be based on real and updated data, favouring the financing of those with the greatest positive impact.

Strengthen sustainability in the building and urban regulations: Having information on the status and future improvements that can be applied to buildings and neighbourhoods can also help to steer regulatory review towards objectively assessed sustainability improvements.

Create a building and urban data bank on sustainability: Public databases on the built environment allow direct access to useful information for many citizens, not only for technicians working in public administration. These citizens can be part of social, educational, and business organizations active in urban development.

Disseminate information to other agents and other areas of government: Economists, lawyers, geographers, and technicians from other disciplines can also make use of the environmental, social, and economic data provided by urban sustainability tools and information sources.

Examples/references

- SMC Assessment Platform
- Check experience carried out also during CESBA MED project.

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8. Supporting participatory decision-making process in public initiatives

Application description

Guaranteeing the comprehensive involvement of all stakeholders in the conceptualization and execution of urban renewal initiatives is fundamental. Recognizing the unique expertise of each stakeholder is essential. The assessment procedure for buildings and neighbourhoods can streamline stakeholder deliberations by presenting precise data in a user-friendly format. Instituting a specialized local committee comprising stakeholders to tackle pertinent matters additionally fosters synergistic dialogue.

Implementing ideas

Choose participatory decision-making: Engaging in a well-informed participatory process empowers individuals to offer responsible opinions on projects or activities and receive justified responses to their concerns. This fosters decision-making consistency.

Engage with individuals and institutions: Dialogues and exchanges of viewpoints occur among various stakeholders or citizen institutions, as well as between citizens and decision-makers. It's imperative to clarify how results will inform decisions.

Establish a collaborative framework: Participatory processes can be structured around phases including information dissemination, participant engagement in discussions, feedback or results communication, and monitoring of agreed-upon actions.

Leverage sustainability assessments: Utilizing agreed environmental, economic, and social assessment tools, alongside validated data, furnishes impartial insights into stakeholder perspectives. Simplifying their complexity without sacrificing accuracy is possible.

Examples/references

- Testing activity conducted during the project.
- Manuals realized related to the participatory approach (PGS, Co-Creation Labs, LPCs).
- Check experience conducted also during CESBA MED project.

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6.3 Transferring and capitalisation activities

Transferring and capitalisation refer to two distinct, but interconnected processes related to the dissemination and exploitation the project results.

- **Transferring Activities** involve the movement or dissemination of knowledge, technologies, methodologies, or best practices developed within the project to external entities, stakeholders, or target audiences. The main goal is to share the project's outcomes and ensure that the knowledge generated is effectively communicated and utilized by relevant parties beyond the project consortium. The main tools of the SMC project are this guide and the resources that can be downloaded from the links provided in 7. Partners contact and online information.
- **Capitalization Activities** focus on maximizing the impact and sustainability of the project results by systematically integrating them into policies, practices, or systems of relevant stakeholders. The aim is to ensure that the project outcomes are not only disseminated but also embedded into the daily operations or policies of organizations, institutions, or communities involved in or affected by the project. The main instruments of the SMC project are the Policy Paper (see section 6.1) and the Decision-Making Process whose material can be downloaded from the link provided in 7. Partners contact and online information.

In brief, transferring activities are about sharing knowledge and project results with external parties, while capitalization activities are about ensuring the lasting impact and integration of those results into the broader context.

6.4 Multi-level Governance for sustainable cities

It is proposed as a framework that involves the collaboration and coordination of various levels of government, along with non-governmental actors. The MLG (Multi-level Governance) requires the involvement of local, regional, national, and even international stakeholders.
Key features of multi-level governance for sustainable cities include:

- **Vertical Coordination**: involves collaboration between different levels of government, ensuring that policies and actions are aligned and complement each other.
- **Horizontal Cooperation**: encourages collaboration among various stakeholders within a specific level of government, integrating diverse perspectives and expertise.

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- **Partnerships with non-governmental actors** engages civil society, businesses, academia, and other entities, integrating a wide range of perspectives and resources into the decision-making process, fostering a more inclusive approach.
- **Decentralization**: MLG may involve decentralizing decision-making parts to local authorities to better integrate needs and challenges of their communities.
- **Flexible and adaptive framework** recognizes the need for adaptive governance structures that can respond to changing circumstances and emerging issues.

7. Partners contact and online information

7.1 Partners contact

Partner	Contact person	Email
iiSBE	Andrea Moro Elena Bazzan Paola Borgaro	andrea.moro@iisbeitalia.org elena.bazzan@iisbeitalia.org paola.borgaro@iisbeitalia.org
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7.2 Online information

SMC Participative platform
Pilot cases development, decision-making process, ways to participate in
https://adhocracy.plus/sustainable_med_cities/

SMC E-Learning platform
Online courses on urban sustainability for decision-makers and technicians
https://www.smc-elearning.eu/

MED Urban Tools Training System
SMC Training system, Collaborative and Assessment Platform and Decision-making process
https://medurbantools.com/portfolio_page/sustainable-med-cities-training-system/

SMC Evaluation tools
Assessment system, online Tools SBTool MED, SNTool MED, SCTool MED
https://sustainablemedcities.tools/

Sustainable MED Cities
Integrated tools and methodologies for sustainable Mediterranean cities
https://sustainablemedcities.tools/

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Annex A: Key Performance Indicators

Key Performance Indicators – Building Scale

The Building Scale is organized as follows:

8 Issues → 25 Categories → 80 Criteria/Indicators → 17 KPIs

Specifically, the **KPIs for the building scale** are:

- B1.1 Primary energy demand
- B1.2 Delivered thermal energy demand.
- B1.3 Delivered electric energy demand.
- B1.4 Energy from renewable sources in total thermal energy consumption
- B1.5 Energy from renewable sources in total electric energy consumption
- B1.6 Embodied non-renewable primary energy.
- B3.4 Recycled materials
- B4.3 Potable water consumption for indoor uses
- C1.1 Embodied carbon
- C1.2 GHG gas emissions during operation
- D1.2 TVOC concentration
- D1.7 Mechanical Ventilation
- D2.3 Thermal comfort index
- D3.1 Daylight
- E1.2 Smart readiness indicator
- G1.4 Energy cost
- H1.2 Heat Island effect

Key Performance Indicators – Neighbourhood Scale

The Neighbourhood Scale is organized as follows:

10 Issues → 43 Categories → 133 Criteria/Indicators → 14 KPIs

Specifically, the **KPIs for the neighbourhood scale** are:

- B2.1 Total final thermal energy consumption for building operations
- B2.4 Total final electrical energy consumption for building operations
- B2.7 Total primary energy demand for building operations
- B3.1 Share of renewable energy on-site, relative to total final thermal energy consumption for building operations.
- B3.4 Share of renewable energy on-site, relative to final electric energy consumption
- B3.7 Share of renewable energy on-site, relative to total primary energy consumption for building operations.
- C2.3 Consumption of potable water in residential buildings
- D2.2 Access to solid waste and recycling collection points
- E1.2 Particulate matter (PM10) concentration
- F1.1 Performance of the public transport system
- F2.3 Bicycle network

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- G3.1 Availability and proximity of key services
- I1.1 Greenhouse gas emissions
- I3.3 Permeability of land

Key Performance Indicators – City Scale

The Neighbourhood Scale is organized as follows:

10 Issues → 39 Categories → 99 Criteria/Indicators → 10 KPIs

Specifically, the **KPIs for the city scale are** are:

- A2.1 Availability of green urban areas
- B2.1 Final energy consumption
- B3.1 Final energy derived from renewable sources.
- C2.1 Total water consumption
- D2.2 Solid waste recycling
- E1.2 Particulate matter (PM10) concentration
- F1.1 Public transport network
- F2.4 Bicycle network
- I1.1 Greenhouse gas emissions
- I3.3 Permeability of land

This project has received funding from the European Union's ENI CBC Med Programme under Grant Contract C_B.4.3_0063