Interreg CENTRAL EUROPE

Co-funded by the European Union

MESTRI-CE

D.1.4.1 Vision for long - term utilization of individual buildings

Final version

09 2024

Content

0. Introduction

Text in blue italics represents instructions and help for partners when writing text, entering data, and creating a document. After the document is created, text in blue italics needs to be removed from the document.

MESTRI-CE project aims to develop a methodology to support the transposition of new EU requirements for each element in the buildings (re)construction investment process: building standards and tools, data management, technical and economic assessment, underwriting processes, forecasting savings potential, measurement, verification, and reporting. The overall objective of the MESTRI-CE project is to achieve harmonization and enhancement of sustainable building and green finance standards to increase the flow of energy efficiency investments in Central Europe. The project will provide building owners with digital holistic solutions for sustainable management, building methods, and innovative financing models and methodology for (re)construction of buildings to reach their long-term goals of climate neutrality.

MESTRI-CE Smart Data Hub consists of all accessible, applicable, and relevant static and dynamic data such as basic building data, project documentation, certificates, building renovation passports, data from energy and water consumption databases, and others. Two important documents will be integral parts of Smart Data Hub: D.1.4.1. A vision for the long-term utilization of individual buildings and D.1.4.3. Action Plan for the long-term utilization of buildings.

This document (D.1.4.1.) describes a vision for the long-term utilization of individual buildings.

This document contains data on the plan and program for the use of the building in the long-term period (10 years), which include, among other things, the purpose/uses of the building, a spatial-functional organization with a statement of relevant parameters and quantification, method of using the building, data on the current functional, constructional and energy state of the building, the planned activities that will take place in the building, the target type of building users, the period of use of the building (at the level of days, weeks and months of the year), the possibility of multi-purpose use of the building, the possibility of transforming the building in the long-term, the structure of the stakeholder that uses the building and manages the building, the way of management, maintenance, and financing of the costs of construction, reconstruction, renovation, etc.

Partners will jointly create D.1.4.2 Joint Strategy for the transition towards long-term climate neutrality of buildings. The strategy will be made in line with D.1.4.1 and officially adopted/accompanied by letters of commitment. D.1.4.3. Action Plans for long-term utilization of building stocks with summarized Visions (D1.4.1) will be based on a jointly developed template or incorporated into existing local and regional plans. The renovation plans will be part of the MESTRI-CE Smart Data Hub and will be aligned with the goals of the previously adopted Joint Strategy.

1. Current state of the building

1.1. Basic information about the building

Building designation	(enter data)	
Name of the building	(enter data)	
Owner of the building	(enter data)	
Type of building	(choose one or more from Family House / Apartment Building / Office Building / Kindergarten / Elementary School / High School / College / Faculty / University / Hospital / Health center / Hotel / Restaurant / Sports hall / Commercial / Building for culture / Mixed use (name use) / Other nonresidential (name function))	
Location	City/Municipality	(enter data)
	Adress	(enter data)
	Cadastral parcel	(enter data)
Dimensions	Number of floors	(enter data)
	Construction gross area of the building (m^2)	(enter data)
	Heated net area of the building (m^2)	(enter data)
	Heated volume of building (m^3)	(enter data)
Timeframe	Year of construction	(enter data)
	Year of reconstruction	(enter data)
	Year of renovation	(enter data)
	Year of extension	(enter data)
Other	(enter other important data, such as whether it is listed as a cultural heritage building…)	

- Briefly and clearly describe the current purpose/function of the building:

- *how the building is designed and divided/structured functionally, what it contains from types of spaces according to purpose*
- *which functional processes (regarding usage) take place in the building and for how many hours during the day, during the week, month, year (approx.) - in the sense of obtaining information about the how the building is frequently used (…heated, cooled…etc.)*
- *how many people use the building as employees, users, and visitors, and how many people gravitate to the building? Write a sentence or two about why the building is essential to the owner/community and its role in the broader context (urban context)...*
- *the way the building is managed (who is the owner, management department, technical department), who is in charge of managing the building, who makes decisions, sentence or two on this process? Please also state your role (as a MESTRI-CE partner) in this process...*
- *use photographs, charts, datasheets, or other appropriate graphics…*

(Text here)

1.2. Existing documentation of building

- State, name, or explain in writing the status of existing documentation of the building, such as:
- *Design documentation from the period of building design and construction*
- *Design documentation from the period of building renovation/reconstruction/extension*
- *Building permit and other documents that serve as evidence of legality*
- *Ownership documents*
- *Energy certificate, Energy Audit Report*
- *Studies, Analysis, other documents…*

(Text here)

1.3. Condition of the building

1.3.1. Construction elements of the building

- Briefly and clearly describe the construction elements of the building:
- *Description of the current condition of the building's construction elements: walls, columns, ceiling, and roof structures (composition, thickness of individual materials, whether there is any damage, particularly regarding thermal insulation materials….)*
- *Description of external openings (type of frame, type of glazing, protection from the insolation….)*
- *Description of the load-bearing structure of the building (if possible and in short)*
- *Use photographs, photo documentation…*

(Text here)

1.3.2. Installations and technical systems

- Briefly and clearly describe installations and technical systems of the building (important is type, energy source used, year of installation (approx.), current condition, remarks on functioning…):
- *Heating, cooling, air condition, ventilation system*
- *Preparation of domestic hot water*
- *Lightning*
- *Solar powerplant*
- *Other electrotechnical systems and installations*
- *Other mechanical systems and installations*
- *hydro-technical installations*
- *Cental automation system*
- *Remote measurement of energy and water system*
- *Other installations and technical systems…*

(Text here)

1.4. Analysis of the existing condition of the building

1.4.1. Analysis of the current situation related to thermal protection, energy efficiency, rational use of energy and renewable energy sources

- Briefly and clearly describe the current situation related to thermal protection, energy efficiency, rational use of energy and renewable energy sources (use data from energy performance certificates, energy audit reports, design documentation, site visit reports, interviews with owners, other sources….), relate this with D1.2.1. Use case scenarios I and II:

- *Energy performance class and data (kWh/m^2 etc.)*
- *Is the building envelope sufficiently insulated (and in all parts)*
- *Does the building comply with requirements regarding the rational use of energy and thermal protection in the building*

(Text here)

- You can also use the following table:

Table: Energy properties of the building

Construction gross area of the building	m^2	
Useful area of the heated part of the building (A_k)	m^2	
Area of the heated part of the building (A)	m^2	
The volume of the heated part of the building (V_e)	m^3	
Building form factor (f_o)	m^{-1}	
Annual required energy for heating ($Q_{H,\ nd}$)	kWh/a	
Annually required energy for heating per unit area of the useful area of the heated part of the building	kWh/m^2	
The annual required energy for the preparation of domestic hot water (Q_w)	kWh/a	
Annual delivered energy for heating	kWh	
Annual delivered energy for the preparation of domestic hot water	kWh	
The annual electrical energy required for lighting (E_l)	kWh	
Annual primary energy (E_{prim})	kWh	
Annual primary energy per unit area of the useful area of the heated part of the building	kWh/m^2	
Annual CO2 emission	t	
Life-cycle GWP	kgCO_2e/m2	
The contribution of delivered energy (Edel) is gained from renewable energy sources.	%	

1.4.2. Analysis of energy and water consumption and costs related to energy and water

- (This is optional if you can get data and make an analysis) - briefly and clearly describe the current situation related to actual energy and water consumption and costs. Analyze for the past three or more years and derive from that reference consumption and cost. Relate this to D1.2.1. Use case scenarios I and II. Use charts, datasheets, and other graphic illustrations.

(Text here)

- Here is an example of datasheets that you can use…

Example: Table Natural gas consumption at the location in m^3

Natural gas (consumption, m^3)				
	Year			Reference consumption
Month	2017	2018	2019	
1	0,00	741,30	2.300,91	1.014,07
2	1.098,08	937,85	513,68	849,87
3	733,21	471,24	387,88	530,78
4	0,00	134,66	0,00	44,89
5	0,00	0,00	500,29	166,76
6	0,00	0,00	0,00	0,00
7	0,00	0,00	0,00	0,00
8	0,00	0,00	0,00	0,00
9	0,00	0,00	0,00	0,00
10	0,00	0,00	0,00	0,00
11	0,00	0,00	842,81	280,94
12	981,14	523,61	209,60	571,45
Total	**2.812,43**	**2.808,66**	**4.755,17**	**3.458,75**

Example: Table Costs of natural gas at the location, in Euro

Natural gas (costs, Euro)				
	Year			Reference costs
Month	2017	2018	2019	
1	12,50	2.005,16	6.179,12	2.732,26
2	4.091,96	2.530,12	1.398,90	2.673,66
3	2.744,09	1.283,76	1.062,43	1.696,76
4	12,50	384,68	25,00	140,73
5	12,50	25,00	1.363,09	466,86
6	12,50	25,00	25,00	20,83
7	12,50	25,00	25,00	20,83

8	12,50	25,00	25,00	20,83
9	12,50	25,00	25,00	20,83
10	12,50	25,00	25,00	20,83
11	12,50	25,00	2.324,37	787,29
12	2.669,63	1.423,66	596,82	1.563,37
Total	**9.618,18**	**7.802,38**	**13.074,73**	**10.165,10**

1.4.3. Analysis of fulfillment of essential requirements for buildings

- (This is optional if you can get data and make an analysis) - briefly and clearly describe the current situation related to the fulfillment of essential requirements for buildings, such as:

- *Indoor air quality*
- *Seismic resistance, mechanical resistance, and stability*
- *Fire safety*
- *Hygiene, health and the environment*
- *Safety and accessibility in use*
- *Noise protection*
- *Sustainable use of natural resources*

(Text here)

2. Planned state of building in the long term

2.1. Requirements for building in the next 10-years period

- *After the previously described current state analysis, this paragraph briefly and clearly describes a scenario for the building in the long-term period regarding investments.*

2.1.1. Functional requirements

- Briefly and clearly describe functional requirements for the building in the long term
- *Is the purpose, function, and type of building staying the same, or is it about to change? How?*
- *Describe new functional requirements, text, data, quantification, plan, or any other data or documents that may be helpful here*
- *Correlation with 2.1 chosen scenario*
- *Add cost estimation*

(Text here)

2.1.2. Constructional requirements

- Briefly and clearly describe constructional requirements for the building in the long term
- *In case of need for reconstruction/renovation/new build, explain what measures will be applied regarding building envelope and construction/building parts that are in the scope of intervention - relate to WP2 and MESTRI-CE Sustainable Building Methodology*
- *Add cost estimation*

(Text here)

2.1.3. Technical requirements

- Briefly and clearly describe constructional requirements for the building in the long term
- *In case of need for reconstruction/renovation/new build, explain what measures will be applied regarding technical systems and installations that are in the scope of intervention - relate to WP2 and MESTRI-CE Sustainable Building Methodology*
- *Add cost estimation*

(Text here)

2.1.4. Overview of all requirements

- Briefly and clearly make overview of all requirements and total cost estimation

Choose one of the following scenarios and explained it as a summary:

(1) ***NEW BUILDING - Construction of a new building*** *- Owners' plans and needs indicate that a new building should be constructed and connected with the existing building on the complex site/same cadastral parcel. Explain with more data and text in 2.1.1.-2.1.4.*

(2) ***RECONSTRUCTION - Upgrading and reconstructing the existing building -*** *Owners' plans and needs indicate that the current building should be upgraded and reconstructed. Reconstruction of existing building implies that the function and/or dimensions, and/or design of that building will change, as well as that perhaps some building parts will be removed/demolished and some new ones will be added/constructed/built. Explain with more text and data in 2.1.1.-2.1.4.*

(3) ***NEW BUILDING AND RECONSTRUCTION - Construction of a new building and reconstruction of the existing building (combination of 1 and 3)*** *- Owners' plans and needs indicate that a new building should be constructed and connected with the existing building on the complex site/same cadastral parcel. At the same time, the current building should be upgraded and reconstructed. Explain with more data and text in 2.1.1.-2.1.4.*

(4) ***RENOVATION - Renovation of the existing building -*** *Owners' plans and needs indicate that the current building should be energy or comprehensively renovated. Renovation implies improving the basic requirements for the building and applying energy efficiency measures to the building envelope and technical systems without changing the function, volume, or the net area of the building. Explain with more text and data in 2.1.1.-2.1.4.*

(5) ***NEW BUILDING AND RENOVATION - Construction of a new building and renovation of the existing building (combination of 1 and 4)*** *- Owners' plans and needs indicate that a new building should be constructed and connected with the existing building on the complex site/same cadastral parcel while at the same time existing building should energy or comprehensively renovated. Explain with more data and text in 2.1.1.-2.1.4.*

(6) ***OPERATIVE INVESTMENTS - Operational maintenance of the existing building*** *- no other investments are needed in the long-term period. Explain with more data and text in 2.1.1.-2.1.4.*

(7) ***NOT PERSPECTIVE - Building is to be removed from the portfolio****. Owners' plans and needs indicate that a new building should be removed from the portfolio, either sold or demolished. Explain with more data and text in 2.1.1.-2.1.4.*

(Text here)

2.2. Policy Framework

- Briefly and clearly describe how proposed scenarios and actions are aligned with
- owners policy framework (strategies, plans, programs, and others) - this is especially related to owners from the public sector
- relation to national/EU policy framework and demands…

(Text here)

2.3. Financial Framework

- Briefly and clearly describe how proposed scenarios and actions are aligned with the financial framework - in relation to WP3
- Results of the assessment (if performed) from the Financial and economic evaluation toolbox (D.3.2.1) with the most important financial indicators:

- Simple Investment Payback Time
- Discounted Investment Payback Time
- Net Present Value (FNPV)
- Financial Internal Rate of Return (FIRR)

Economic assessment results as optional:

- Economic Simple Investment Payback Time
- Economic Discounted Investment Payback Time
- Economic Net Present Value (ENPV)
- Economic Internal Rate of Return (EIRR)

3. Vision for building utilization in long-term period

- *After the previously described current state analysis, this paragraph briefly and clearly represents a scenario for the building in the long-term period regarding investments:*
- *In the form of a conclusion, briefly and clearly describe/state/name:*
    - *Vision for building utilization in a long-term period (2 or 3 sentences about scenarios in chapter 2.1)*
    - *Time framework for actions*
    - *Human Resources - management, operative team, other needed stakeholders*
    - *Policy/Legal Perspective - bottlenecks, challenges that need to be solved*
    - *Financial Framework - challenges, things to be done to investment happen*
    - *Next steps - in the form of the to-do list*
    - *Make relation to D1.4.3 Action Plans for long-term utilization of building stocks*