CEESEN-BENDER

Building intErventions in vulNerable Districts against Energy poveRty

Deliverable 5.1

Building renovation roadmaps in 5 pilot areas

Pilot area Roadmap for multi-apartment buildings renovations in the Municipality Kidričevo and City Municipality of Ptuj

WP 5 - Creating roadmaps and support services for building energy renovations for vulnerable districts

Dissemination Level: Public

Co-funded by the European Union

Contents

1.Introduction

Energy renovation of residential buildings is an important part of Slovenia's climate and energy strategy, aligned with the EU's Renovation Wave and the long-term goals of the Energy Performance of Buildings Directive (EPBD). The building sector represents about 40 % of total energy consumption in the EU and Slovenia, highlighting the crucial role of energy renovation in reducing energy use, cutting greenhouse gas emissions, and enhancing building performance.

In Slovenia, national strategies and legislative frameworks are progressively strengthening support for building renovation. The Long-Term Strategy for Energy Renovation of Buildings until 2050 (DSEPS 2050) sets ambitious targets for deep renovation of both single-family and multi-family housing, aiming for a substantial reduction of energy consumption and CO_2 emissions by mid-century. The Act on Energy Efficiency (ZURE) and related policy processes introduce mechanisms such as renovation passports and energy performance indicators to support systematic renovation planning and implementation.

Slovenia has also adopted a National Action Plan to Reduce Energy Poverty, allocating nearly 34 million EUR for the period 2024–2026 to lower energy poverty rates and support energy efficiency and renewable energy measures for vulnerable households. This plan includes incentives for thermal insulation, heating system upgrades, and collective renovation actions, with particular attention on households at risk of energy poverty.

Despite these frameworks, the existing residential building stock, especially multi-apartment buildings constructed between the 1960s and 1980s, often suffers from low energy performance, contributing to high energy costs and increased vulnerability to energy poverty. Comprehensive renovation efforts remain limited, with relatively few projects achieving medium or deep energy savings under current renovation activities.

At the regional level, the Municipalities of Kidričevo and Ptuj face specific barriers that must be addressed to accelerate energy renovations of MABs. These include:

- **Technical obsolescence of building envelopes and systems**, leading to increased heat losses and inefficient energy use;
- **Fragmented and insufficient access to systematic financing** for renovation, with a need to better leverage national (e.g., Eco Fund incentives) and EU cohesion funds tailored for multi-apartment renovations;
- **Socio-economic challenges and organisational barriers**, such as limited capacity of building managers to coordinate renovation decisions and mobilise co-financing—issues that disproportionately impact low-income and energy-poor households.
- **Cultural heritage protection.** The entire settlement of Kidričevo is under the cultural heritage protection, which adds another dimension into energy renovation. All works that affects the exterior appearance of buildings must be agreed with the Institute

for the Protection of Cultural Heritage of Slovenia (ZVKDS). These require adjustments to the works on the outer walls, which usually means adapted materials or implementation methods, and generally this increases the cost of energy renovations.

This Roadmap supports the implementation of targeted, technically robust measures that align with national and EU policy objectives, such as:

- **Integrating comprehensive building renovation planning** to prioritise interventions with the greatest energy savings potential;
- **Mobilising and combining multiple funding streams** (national grants, cohesion policy funds, Eco Fund incentives) to reduce financial barriers for deep renovation;
- **Strengthening technical assistance and local governance capacities**, especially for building managers and municipalities, to streamline project preparation and implementation;
- **Ensuring equity-focused criteria** that prioritise renovations benefiting energy-poor households and reducing their energy cost burdens.

By embedding these actions within Slovenia's broader energy renovation framework and focusing on affordability, fairness, and sustainability, this Roadmap contributes to the just transition toward a climate-neutral built environment in Podravje with a special focus to the pilot areas in the Municipality of Kidričevo and City Municipality of Ptuj.

2.Vision of the roadmap

The roadmap envisions warmer, healthier, and more affordable homes for residents of multi-apartment buildings in Kidričevo and Ptuj, with energy renovation directly improving quality of life and reducing the burden of high energy costs, especially for vulnerable households. Through inclusive decision-making, tailored financial support, and strong local advisory services, energy renovation becomes accessible to all residents, regardless of income or building constraints. In this way, the pilot area demonstrates how local, socially fair renovation can strengthen communities while contributing to long-term climate and energy goals.

3.Objectives of the roadmap

Overall Objective

To accelerate **fair, accessible, and technically sound energy renovation of multi-apartment buildings** in the pilot municipalities, contributing to the reduction of energy poverty while supporting Slovenia's and the EU's climate and energy targets.

Specific objectives

- **Increase the rate of energy renovation of multi-apartment buildings (MABs)** in the pilot area, specifically in the Municipality of Kidričevo and the City Municipality of Ptuj, with an emphasis on comprehensive and deep renovation measures that deliver measurable energy savings.

- **Reduce the share of households exposed to high energy cost burdens and energy poverty**, by improving the energy performance of buildings, lowering final energy consumption, and increasing thermal comfort, particularly for vulnerable and low-income residents.
- **Promote active involvement of citizens and residents in the renovation process** through participatory and inclusive governance models, including structured stakeholder engagement, awareness-raising, and support for collective decision-making within homeowner associations.
- **Introduce and test tailored financial mechanisms** that enable access to energy renovation for socially vulnerable groups, including the combination of public grants, subsidies, and innovative financing schemes aimed at reducing upfront investment barriers.
- **Ensure that renovation activities contribute directly to national and EU energy and climate objectives**, including Slovenia's Long-Term Strategy for Energy Renovation of Buildings, the Energy Efficiency Act (ZURE), and EU targets under the Energy Performance of Buildings Directive (EPBD), the Renovation Wave, and climate neutrality commitments.

4.The current status of legislative and regulatory frameworks for building renovation

4.1 EU Policy Framework for Building Renovation

Over the past decade, the European Union has established an ambitious regulatory and financial framework to increase the scale and depth of building renovation, recognizing that buildings account for a significant share of final energy consumption and greenhouse gas emissions. Central to these efforts are updates to two main directives—the Energy Performance of Buildings Directive (EPBD) and the Energy Efficiency Directive (EED)—the strategic Renovation Wave initiative, and a suite of EU and international financial instruments aimed at bridging the investment gap and promoting comprehensive deep renovations.

Key Regulatory Instruments and Initiatives:

Energy Performance of Buildings Directive (EPBD)

The EPBD requires Member States to develop long-term national strategies for the renovation of their building stock, establish minimum energy performance standards (MEPS), and implement mechanisms for monitoring and planning renovations at the national level. Recent revisions include requirements for national renovation plans and building "long-term renovation pathways" to achieve net-zero emissions by 2050. For multi-apartment buildings (MABs), this translates into mandatory renovation planning, implementation of minimum standards, and adoption of long-term strategies.

Energy Efficiency Directive (EED)

The revised EED establishes obligations for energy savings, reporting, and the promotion of energy services and project support. It provides tools for project development and technical assistance, which are particularly relevant for large-scale, multi-building or district-level renovation packages.

Renovation Wave (2020) and Action Plans

The Renovation Wave aims to at least double current renovation rates and renovate millions of buildings by 2030, with a strategic milestone of 35 million renovated buildings. The initiative emphasizes deep renovations, creation of financial mechanisms, digital tools such as Building Renovation Passports (BRPs), and job creation in the construction sector. For MABs, it promotes integrated, package-based interventions addressing building envelopes, systems, and common areas, and supports phased, tailored renovation planning.

EU Actions Against Energy Poverty and Social Support

Energy poverty is recognized as a multi-dimensional challenge in EU policy. Mechanisms such as the Social Climate Fund and REPowerEU measures target vulnerable households, combining technical interventions with socio-economic support, such as tariff protection, direct aid, and financing for renovations of energy-poor households. This is particularly relevant in MABs, where ownership structures are heterogeneous and vulnerable groups are often present.

New Tools and Instruments Relevant for MABs

- **Building Renovation Passport (BRP)**: Supports phased, tailored renovation planning for owners and residents, enabling greater transparency, prioritization of measures, and coordination among multiple owners.
- **Minimum Energy Performance Standards (MEPS) and Long-Term Pathways**: Encourages Member States to set minimum standards for the worst-performing buildings and define timelines to raise average energy performance, which can trigger mandatory renovations and necessitate accompanying social measures to protect vulnerable owners.

EU-Level Financial Mechanisms

Public and Structural Funds

- Cohesion Policy / ERDF & Cohesion Fund (2021–2027): Provides substantial funding for energy efficiency and renovations at the regional level. Member States define priorities in operational programs, offering key channels for co-financing MAB renovations.

Central and Banking Instruments

- Recovery and Resilience Facility (RRF): Enables Member States to invest in green transitions, including MAB renovation programs.
- InvestEU & European Investment Bank (EIB): Offer loans, guarantees, and technical assistance. Advisory instruments such as ELENA reduce project preparation costs significantly (up to 90%) and are essential for aggregated MAB projects (neighbourhood or multi-building packages).

Targeted Social Financing and Temporary Schemes

- Social Climate Fund and REPowerEU / Fit for 55 measures provide direct support to vulnerable households, combining technical renovation interventions with social safeguards.

Key Lessons for Multi-Apartment Buildings

1. **Combination of tools is essential**: Regulatory pressure (e.g., Minimum Energy Performance Standards, EPC requirements) must be supported by financing and technical project preparation, especially where ownership is heterogeneous and resources are limited.
2. **Demand aggregation and package projects**: Instruments like ELENA or cohesion programs facilitate larger projects, reduce transaction costs, and achieve economies of scale for MABs.
3. **Social component is mandatory**: Policies addressing energy poverty must accompany technical renovations to avoid negative social impacts, such as increased costs or exclusion of vulnerable families.

4.2 National Context – Slovenia

Slovenia has developed a series of strategic documents and programs aimed at increasing the scale of comprehensive energy-efficient building renovations while simultaneously reducing energy poverty. Key national instruments include:

- **Long-Term Strategy for the Renovation of Buildings until 2050 (DSEPS 2050)**, which sets progressive targets for the renovation of residential and public building portfolios, with a focus on multi-apartment buildings (MABs), where potential energy savings and impacts are greatest. The goal is that by 2050, 91 % of all MABs in Slovenia are energy renovated.
- **Updated National Energy and Climate Plan (NECP)**, which emphasizes the need for systemic renovation measures and mobilization of investments in the building sector.

Legislatively, the implementation of EPBD and EED in Slovenia is integrated with national measures, requiring preparation of long-term renovation plans, adherence to minimum energy performance standards, and monitoring through energy performance certificates (EPCs) and building minimum standards. At the operational level, this implies that local renovation programs must align with EU targets and national strategic timelines.

Main Financial Instruments and Programs in Slovenia

Renovation of buildings is supported through a combination of national incentives, state and EU funds, and commercial financing. Key instruments include:

- **Eco Fund**: The main operational body providing subsidies and favourable loans for energy renovation measures, including programs for deep renovation of MABs. Recent calls have increased funding intensity for specific measures such as heating system upgrades in older buildings.
- **Recovery and Resilience Facility (RRF) and national green transition programs**: Significant funding source for large-scale public renovations and energy efficiency investments, including support for social housing projects in regional contexts.
- **Cohesion Funds (ERDF/Cohesion Fund)**: Available through operational programs for co-financing regional renovation measures; national and regional authorities define priority lines for MAB renovations.

- **EIB / InvestEU / advisory instruments (e.g., ELENA)**: Support aggregated multi-apartment projects, lowering project preparation costs and attracting private capital. These instruments are crucial for neighbourhood or package renovations that require technical and financial coordination.

Regional Context – Podravje

The Podravje region faces typical challenges of the Slovenian building stock: older multi-apartment blocks with insufficient envelopes, outdated heating systems, and heterogeneous ownership structures. Local agencies, building managers and municipalities are actively preparing project applications and embedding renovation priorities into regional development plans.

Pilot area challenges:

- **Ptuj:** Renovation of multi-apartment buildings (MABs) in Ptuj is at a relatively advanced stage, with many buildings already renovated. However, several buildings still require renovation. The overall process does not face specific issues beyond the usual challenges described above.
- **Kidričevo:** Renovation of MABs in Kidričevo faces a very different set of challenges, where multiple factors converge and hinder progress. The entire settlement of Kidričevo is under cultural heritage protection, adding an extra dimension to energy renovation. Any work affecting the exterior appearance of buildings must be approved by the Institute for the Protection of Cultural Heritage of Slovenia (ZVKDS). This often requires adjustments to external walls, including adapted materials or specialized implementation methods, which generally increase the cost of renovations. Additionally, many residents are elderly or recipients of social assistance, creating social barriers to the renovation process. On one hand, heritage protection requirements raise renovation costs, and on the other, the residents' social situation makes it more difficult to obtain consent for renovation.

Capacities, Market Conditions, and Barriers

- The region has local construction companies and energy advisors, but there is often a lack of capacity for complex, aggregated MAB renovation projects due to administrative and financial constraints.
- Projects funded through RRF and Eco Fund generate demand for skilled contractors and project management systems, fostering growth of local expertise.
- Specific barriers for MABs in Podravje:
    - Heterogeneous ownership, complicating consensus for comprehensive renovations,
    - Limited liquidity among vulnerable households, necessitating socially targeted financial instruments,
    - Administrative complexity of grant applications and lack of one-stop-shop advisory services,
    - Insufficient building-level data (condition assessment, investment needs), hindering economically justified project preparation.

Positive Developments and Opportunities

- Increased number of public investments (e.g., Ptuj) and Eco Fund activities (pilot calls, higher subsidies) provide more funding opportunities for coordinated public-private MAB renovations.
- Local agencies such as LEA Spodnje Podravje, and projects like CEESEN-BENDER, build local capacity to support vulnerable households and provide integrated advisory services, fostering a “one-stop-shop” approach for MAB renovations.

5.Energy poverty in the pilot region

5.1 National Context: Energy Poverty and Multi-Apartment Buildings (MABs)

Energy Poverty in Slovenia

Statistical data indicate that households in the lowest income decile in Slovenia spend over 20 % of their disposable income on residential energy, highlighting significant energy vulnerability. In recent years, the share of energy expenditures has risen sharply among the poorest households, while higher-income households have been less affected. Single-person households and tenants face the greatest challenges in affording adequately heated homes.

Overall, 94 % of Slovenian households have been able to afford adequately heated homes in recent years. However, this share varies by income: 87 % in the lowest income quintile, compared to 99 % in the highest. This demonstrates a persistent and growing risk of energy poverty, particularly among low-income and socially vulnerable groups.

The EU provides guidance to Member States through the Energy Efficiency Directive (EED) and related energy services legislation, which establishes obligations to improve energy efficiency while protecting vulnerable consumers. In Slovenia, the national legal framework addressing energy poverty and energy efficiency includes:

- Energy Act (EZ-2), Official Gazette of the Republic of Slovenia No. 38/24 and 47/25
- Action Plan for Reducing Energy Poverty

These legal instruments establish the basis for energy renovation measures, efficiency standards, and social protections for vulnerable households, providing the framework for interventions in multi-apartment buildings.

5.2 Regional Situation: Energy Poverty in Podravje

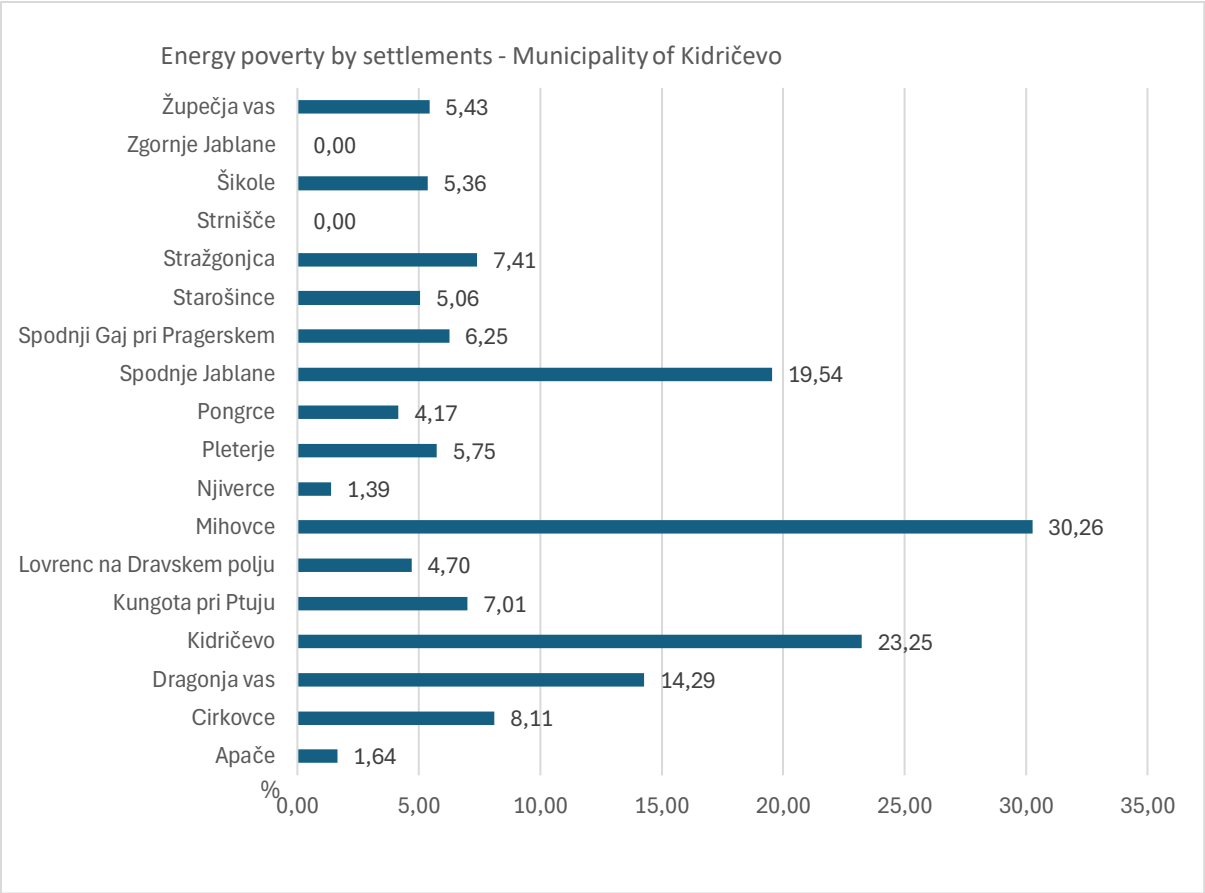
The Podravje region faces above-average energy poverty risk, which worsens social and technical vulnerability in residential buildings. In 2024, approximately 10 % of households in the region were classified as energy poor, an increase of nearly three percentage points from the previous year, compared to the national average of 7,2 %.

Out of the 41 municipalities in Podravje, only 19 report energy poverty levels below the national average. Energy poverty is most prevalent among older single-person households, socially vulnerable individuals, and single-parent families.

Addressing energy poverty in Podravje requires a combined approach: social measures to protect vulnerable households, together with comprehensive energy renovation of multi-apartment buildings. Without integrated solutions, regional disparities relative to the national average cannot be effectively reduced.

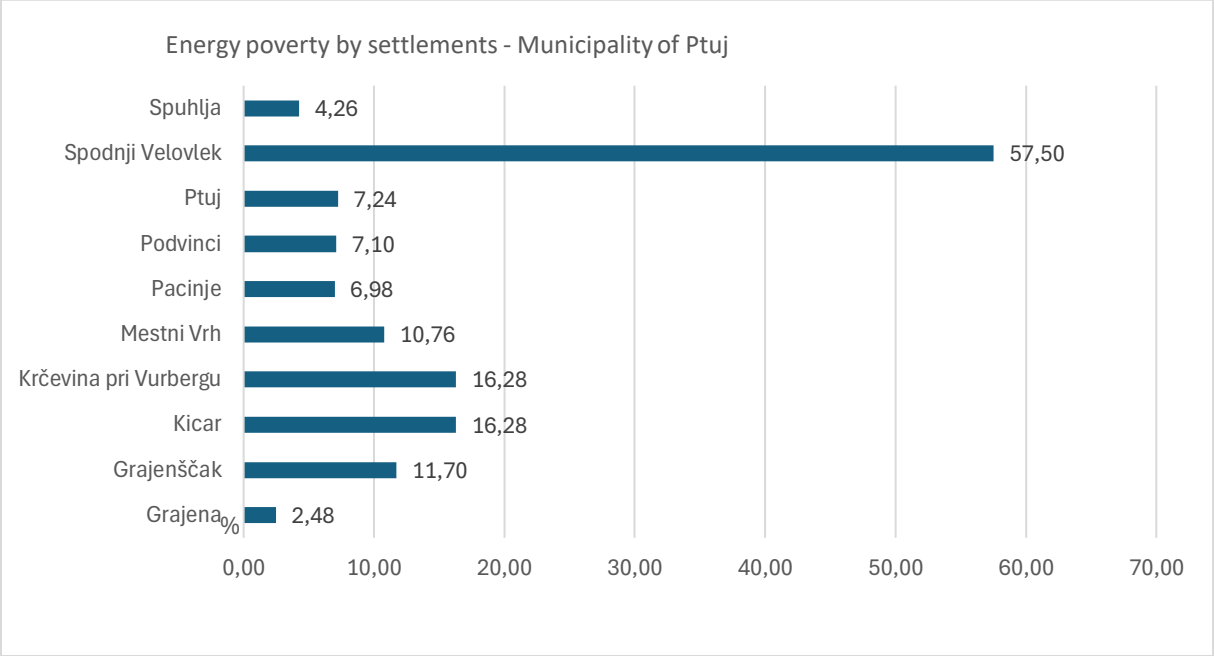
Energy poverty in the Municipality of Kidričevo

LEA Spodnje Podravje analysed energy poverty by individual settlements for all municipalities in the Podravje region. The energy poverty analysis was carried out based on data obtained from the local Centres for Social Work and local branches of the Red Cross. The figure below presents the results for the Municipality of Kidričevo. For the settlement of Kidričevo, where the pilot multi-apartment residential area is located, it was estimated that 23,25 % of all households can be classified as energy poor.



Energy poverty in the City Municipality of Ptuj.

For the city of Ptuj, where multi-apartment residential buildings are located, energy poverty as such does not stand out significantly, as it is somewhat more characteristic of areas outside the urban centre. It is therefore much more pronounced in the surrounding villages.



6.MAB renovation in the pilot region

6.1 National/regional/local programmes

Energy renovation of multi-apartment buildings (MABs) in Slovenia is supported through a combination of national, European, and regional programs, designed to promote deep renovations while addressing energy poverty. Key instruments available in the pilot region include:

- **Eco Fund**: Providing subsidies and low-interest loans for comprehensive MAB renovations, including envelope upgrades, heating system modernization, and integrated energy efficiency measures.
- **Recovery and Resilience Facility (RRF)**: Financing large-scale public and social housing renovations, complementing national and regional initiatives.
- **Cohesion Funds (ERDF/Cohesion Fund)**: Supporting regional programs for energy efficiency measures in MABs, often through aggregated or neighbourhood-scale projects.
- **Local Energy Agencies (e.g., LEA Spodnje Podravje)**: Providing technical assistance, guidance for homeowners, and coordination for pilot projects targeting vulnerable households (e.g., CEESEN-BENDER (LIFE-CET), I-PRODER (SI-HR)).

6.2 MAB context

In the pilot municipalities of Ptuj and Kidričevo, many multi-apartment blocks were constructed in previous decades without adequate thermal insulation which leads to high energy costs and reduced thermal comfort.

Ownership structures are often fragmented, with wide variations in financial capacity, age, motivation, and awareness of renovation benefits among unit owners. This heterogeneity complicates consensus-building for joint investments and slows the implementation of comprehensive renovation measures.

Energy poverty adds a critical layer of complexity: residents with lower incomes may lack sufficient resources to co-finance renovations, making it necessary to implement support models that combine subsidies, favourable loans, and technical assistance. By integrating social support with technical interventions, renovations can become both economically feasible and socially inclusive, ensuring that deep energy efficiency measures reach the households that need them most.

MAB status in Kidričevo and challenges to the renovation process

As described, the settlement of Kidričevo is under Cultural Heritage protection which represents a significant challenge to the energy renovation process. Thus, LEA Spodnje Podravje gives a special focus on the specific area. Based on the analyses of buildings, the engagement with the representatives of the municipality, the building managers and residents, the following challenges have been identified:

1. Restrictions on Building Envelope Interventions

One of the most significant challenges relates to limitations on facade interventions. External thermal insulation systems (ETICS), which are typically the most cost-effective energy efficiency measure for MABs, are restricted or require special treatment in heritage-protected areas. Changes to facade appearance, materials, colours, and details must preserve the original architectural expression, which often increases costs and limits technical options.

2. Limited Applicability of Standard Renovation Solutions

Standardised renovation packages promoted at national level are often not directly applicable in Kidričevo. Each building requires an individual heritage assessment, which slows down the renovation process and increases administrative and planning complexity. This represents a barrier especially for socially vulnerable households and building communities with limited organisational capacity.

3. Higher Investment Costs and Financial Barriers

Heritage-compliant renovation solutions (e.g. thinner special insulation materials, internal insulation, custom-made facade solutions) are typically more expensive than conventional measures. For MABs with a high share of low-income households, this significantly worsens energy poverty risks, as owners may not be able to cover higher co-financing requirements even when subsidies are available.

4. Complex Approval Procedures

Renovation projects require close coordination with heritage protection authorities, including prior guidelines, approvals, and supervision. This additional procedural layer is often perceived by building managers and owners as a major obstacle, discouraging them from initiating renovation processes altogether.

5. Low Awareness and Limited Technical Capacity

Many residents and building representatives are not sufficiently informed about what energy renovation measures are allowed within heritage protection regimes. A lack of targeted guidance leads to uncertainty, delays, and in some cases abandonment of renovation plans. It has also been noticed that awareness of financial incentives specifically targeting energy poverty is low among residents – particularly about the ECO Fund calls.

6.3 Stakeholder involvement in the renovation of MAB sector in the pilot areas

The renovation of multi-apartment buildings (MABs) in Podravje involves a diverse set of stakeholders, each playing a critical role in the planning and implementation of energy efficiency measures. Primary decision-makers are residents and apartment owners, whose consent is essential for collective interventions. Building managers often act as coordinators, facilitating communication between owners, contractors, and funding agencies.

Local municipalities provide project support and policy guidance, while Eco Fund serves as the main financier, offering grants and subsidized loans. Local energy agencies, such as LEA Spodnje Podravje, provide technical advisory services, organize workshops, and assist with project applications.

The successful coordination of these actors is crucial, as MAB renovation combines technical, financial, and social dimensions. Engagement methods include information campaigns, participatory workshops, and structured coordination meetings, ensuring residents understand benefits, financing options, and procedural steps. The involvement of technical experts and advisory services is particularly important for aggregated projects or phased renovations, where logistical complexity could otherwise hinder implementation.

6.4 Main drivers of the MAB renovation process

In the pilot areas, several strong drivers motivate MAB renovations:

- **Reduction of heating and energy costs**: Renovating the building envelope and optimizing heating systems can significantly lower energy bills.
- **Improved living conditions**: Renovations enhance thermal comfort, reduce heat loss, improve ventilation, and provide aesthetic upgrades.
- **Availability of public incentives**: Grants and low-interest loans from Eco Fund strongly encourage owners to invest in deep renovations.
- **Commitment to green transition**: Municipal and national policy support reinforces the social and environmental value of renovations.
- **Technical and administrative support**: Advisory services provided by LEA and other “one-stop-shop” points reduce the logistical burden for unit owners and facilitate complex renovation packages.

These drivers interact synergistically, creating a favourable environment for deep energy renovations while addressing both technical performance and social inclusivity.

6.5 Main difficulties of the MAB renovation process

Despite supportive policies, several barriers persist in the region:

- **Heterogeneous ownership structures**: Variations in financial capacity, motivation, and awareness among unit owners complicate consensus-building for joint interventions.

- **Limited liquidity**: Even when grants are available, co-financing requirements (e.g., loans, reserve fund contributions) may exceed the resources of some households.
- **Administrative complexity**: Preparing applications for public funding and assembling project documentation can be time-consuming and technically demanding.
- **Shortage of qualified contractors**: Complex, multi-phase renovations require specialized companies capable of combining envelope improvements, heating systems upgrades, and coordination across trades.
- **Post-renovation maintenance**: New systems require ongoing management, which can pose additional obligations for residents or building managers.

Addressing these challenges requires integrated approaches combining financial, technical, and social measures to ensure equitable and sustainable renovations.

6.6 MABs in need for renovation works

In the pilot municipalities, many MABs were built without adequate insulation and with outdated heating systems, creating high energy demand and increased vulnerability to energy poverty. Identifying buildings in most need of renovation involves assessing building condition, energy performance, and resident socioeconomic profiles.

Tools such as energy audits, building energy performance certificates (EPCs), and renovation passports support planning and prioritization. Aggregating buildings by urgency and potential energy savings allows for efficient allocation of public and private financing, ensuring that deep renovations target the most critical cases while optimizing cost-effectiveness.

Estimating financing needs at the regional level is essential for planning subsidy allocation, loan programs, and technical support, providing a strategic basis for coordinated intervention in the municipalities Ptuj and Kidričevo.

6.7 MAB renovation role in achieving national targets

Renovating multi-apartment buildings in Ptuj and Kidričevo can substantially contribute to Slovenia's national energy and climate priorities. Expected benefits include:

- **Reduction in energy consumption and associated costs** for residents.
- **Improved energy efficiency and lower greenhouse gas emissions**, supporting DSEPS 2050 and the national Green Transition objectives.
- **Enhanced social equity**, ensuring that vulnerable households gain access to comfortable, energy-efficient housing through targeted subsidies and financing schemes.
- **Strengthened local technical and institutional capacities**, including trained contractors, advisory services, and energy agencies, which ensures **sustainable implementation and replication** of renovation measures.

By integrating energy efficiency, financial accessibility, and social inclusion, MAB renovation in the pilot areas serves as a cornerstone of national climate, energy, and social policy, providing a scalable model for other Slovenian regions and EU Member States.

6.8 Financial solutions

The renovation of multi-apartment buildings (MABs) in Slovenia is supported through a combination of national, regional, and European financial instruments. These instruments are designed not only to improve energy efficiency and reduce greenhouse gas emissions but also to ensure social equity, particularly in areas where energy poverty is prevalent.

At the national level, Eco Fund plays a central role by providing subsidies and preferential loans for comprehensive building envelope renovations, heating system modernization, and integration of renewable energy sources. Recent pilot calls specifically target older MABs, increasing the intensity of support and linking technical advisory services to financial incentives. This ensures that both the technical complexity and financial barriers of deep renovations are addressed.

The **Recovery and Resilience Facility (RRF)** supports larger-scale renovations, allowing municipalities to combine RRF funding with local subsidies for comprehensive MAB interventions. Similarly, cohesion policy funds, including the ERDF and Cohesion Fund, provide regional support and facilitate aggregated projects that pool multiple buildings together. This approach reduces administrative and transaction costs while maximizing the impact of renovation measures.

The **European Investment Bank (EIB) and InvestEU** provide further mechanisms, including financial guarantees, low-interest loans, and technical assistance. Instruments such as ELENA cover a significant portion of project preparation costs (up to 90 %), making large-scale and neighbourhood-level renovation projects feasible. These instruments are particularly relevant in the pilot areas, where multi-apartment buildings often require coordinated interventions across building envelopes, heating systems, and shared infrastructure.

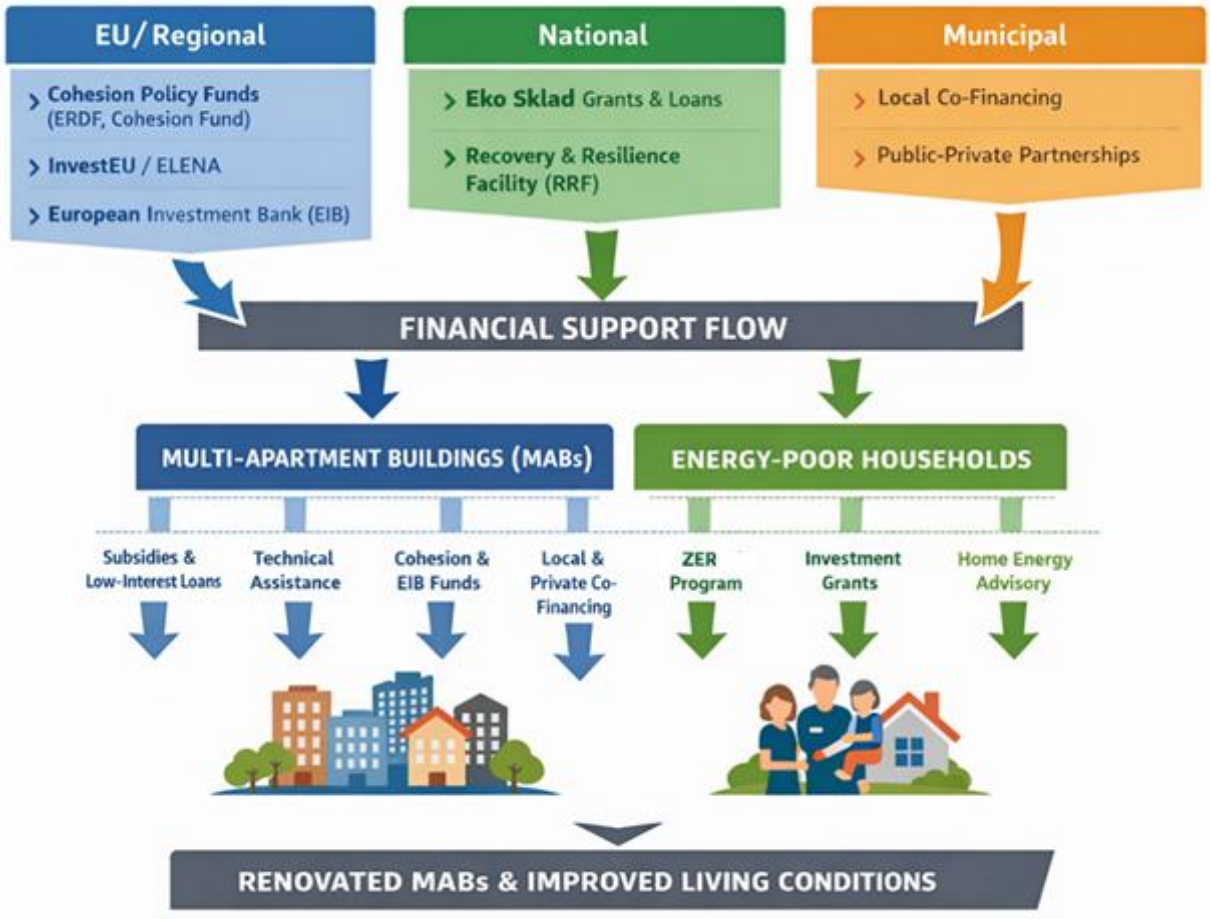
For energy-poor households, targeted measures complement general MAB renovation financing. Slovenia's **Energy Poverty Reduction Action Plan (2024–2026)** provides an integrated approach combining investment subsidies, technical advisory, and social support. Programs like the ZER 2024 public call focus on households with limited financial capacity, ensuring that vulnerable residents can participate in deep renovation interventions. Home energy advisory visits (ENSVET) offer personalized guidance, help with applications for subsidies, and provide energy-saving devices to reduce energy consumption and costs.

Between 2024 and 2026, approximately 33,8 million EUR is allocated to these energy poverty measures, with the Climate Fund (24 million EUR) and European Regional Development Fund (15 million EUR) as the primary sources. These funds support investment measures, engagement of vulnerable households in energy communities, and the operation of regional advisory points and project offices. Additional measures, such as legal provisions for emergency electricity supply, ensure that vulnerable households maintain access to essential energy during renovation processes.

In the pilot areas of Ptuj and Kidričevo, these financial instruments enable multiple pathways for MAB renovation. Aggregated projects allow apartment owners to pool resources and combine subsidies, loans, and municipal contributions. Technical and advisory support from LEA Spodnje Podravje and ENSVET ensures that administrative and technical barriers are overcome, facilitating comprehensive renovations of building envelopes and heating systems. These interventions not only improve energy efficiency and thermal comfort but also reduce energy costs, decrease greenhouse gas emissions, and strengthen local capacities for sustainable energy management.

Overview of Financial Instruments and Support for MAB Renovation

Level	Instrument / Program	Target	Type of Support	Pilot Area Relevance
National	Eco Fund	All MABs	Subsidies & low-interest loans for envelope, heating, RES	High – Ptuj & Kidričevo MABs eligible
National / Social	Energy Poverty Reduction Scheme (ZER 2024) – Eco Fund	Vulnerable households	Investment subsidies, advisory visits, awareness campaigns	High – targets energy-poor residents in MABs
National / Public Investment	Recovery & Resilience Facility (RRF)	Large public & multi-apartment buildings	Grants for deep renovation, municipal co-financing	High
Regional / EU	Cohesion Policy (ERDF / Cohesion Fund)	Aggregated MAB projects	Grants, technical assistance	Medium-High – regional aggregation of multiple MABs
European	EIB / InvestEU / ELENA	Aggregated or complex MAB renovations	Loans, guarantees, project preparation support	High – supports neighbourhood-scale packages
Municipal / Local	Public-private partnerships	Local MABs and public buildings	Contracting, co-financing models	Medium
Private sector	Commercial loans	Individual owners or associations	Low-interest financing, sometimes state guarantees	Medium – dependent on project aggregation and owner capacity
Advisory / Technical	LEA Spodnje Podravje, ENSVET	All MABs, energy-poor households	Technical advisory, project coordination, energy audits	High – critical for project feasibility and quality



6.9 Results of energy poverty-based prioritisation

Within the CEESEN-BENDER project, a digital tool was developed to support the prioritisation of buildings for energy renovation. The tool analyses a combination of technical building characteristics and socio-economic indicators and ranks selected buildings according to their renovation priority.

For Slovenia, LEA Spodnje Podravje collected data for 30 non-renovated multi-apartment buildings, including six CEESEN-BENDER pilot buildings and an additional 24 buildings located in the Municipality of Kidričevo. The data collection process was fully anonymised, ensuring that no sensitive information was disclosed. Buildings are identified exclusively by assigned reference numbers, while address data are stored separately in the archives of LEA Spodnje Podravje.

The highest-ranked buildings identified by the tool are presented in the table below. The results indicate that two of the three highest-ranked buildings are among the selected pilot buildings, confirming the appropriateness of the pilot building selection.

Key building parameters	A6	B15	A2
Year of construction	-	1976	1953
Number of floors	7	7	6
Number of apartments	22	31	51
Building net floor area, m^2	1.956,20	2.509,70	5.109,60
Average living area per apartment m^2	33,58	61,30	49,40
Main heating system	District heating	District heating	District heating

Two of the analysed buildings are located in Kidričevo, while one is located in Ptuj. All buildings are connected to the local district heating system. Regarding energy renovation, the primary recommended measure is facade insulation. Most windows have already been replaced by individual apartment owners or building managers due to ageing, air leakage, and general wear and tear.

For the estimation of renovation costs, the analysis focuses on the main and most impactful measure—facade insulation. This measure includes the insulation of external walls, excavation works at the foundations, waterproofing, and the installation of thermal insulation at the foundation level where required.

The costs for the energy renovation of the 3 highest ranked MABs are in total estimated at approximately 800.000 EUR.

7. Best practice cases from Slovenia

Comprehensive Energy Renovation at Jakčeva ulica 12, Novo mesto

The residential block at Jakčeva ulica 12 in Novo mesto is a leading example of multi-apartment building (MAB) renovation in Slovenia. Implemented under the LIFE IP CARE4CLIMATE initiative, the project tested innovative financial solutions to enable deep energy upgrades in older MABs, addressing common multi-owner challenges.

The renovation included facade and roof insulation, upgraded windows, improved common-area lighting, and enhancements to shared spaces. Full homeowner consent (100 %) was achieved, supported by structured engagement and professional coordination. Financially, the project combined 80.186 EUR in grants with 48.197 EUR in reserve fund loans, reducing upfront costs and distributing investments over time.

Although exact energy savings are not disclosed, the renovation aligns with deep renovation principles, offering long-term energy reductions and improved comfort. The project showcases a scalable financing model that can be replicated in other municipalities, demonstrating the importance of combining technical, financial, and social support for successful MAB renovations.

Jakčeva ulica 12

Deep Renovation of MAB

Novo mesto, Slovenia (Multi-apartment residential building

Key Measures Implemented

- ✓ Thermal insulation of façade and roof
- ✓ Replacement/upgrade of windows
- ✓ Improved lighting in common areas
- ✓ Upgrades to shared building spaces

Financial Structure

Non-repayable incentives: 80,186 EUR

Reserve fund loans: 48.197 EUR

+ Blended financing allows owners to cover costs over time

Stakeholder Engagement

100% homeowner consent

Coordnation by building manager and technical advisors

Project Outcomes

Significant **energy-efficiency improvements** (heating demand reduction, better thermal comfort)

Demonstration **of scalable financing model for** MAB renovations

Replication Potential

- ✓ Model can be applied to other **Slovenian municipalities** (e.g., Ptuj, Kidričevo)
- ✓ Demonstrates integration of **LIFE co-funding,** national subsidies, and technical support

www.ekosklad.si

8. Priority areas and recommendations in the pilot region

8.1 Priority area 1: Addressing Energy Poverty

In the pilot area of Podravje, particularly in the municipalities of Ptuj and Kidričevo, energy poverty remains a pressing challenge. Households with limited financial resources struggle to afford adequate heating and energy services, which is worsens in older multi-apartment buildings with poor thermal performance. Actions under this priority area should focus on both immediate relief and long-term structural improvements. These include targeted financial support for low-income households to cover renovation costs, technical assistance to facilitate the uptake of subsidies and low-interest loans, and the promotion of energy advisory services at the building level. Special attention should be given to ensuring that vulnerable groups such as single-person households, the elderly, and social housing tenants, are included in participatory planning processes and benefit from renovation programs.

Actions:

1.1 Targeted financial support for vulnerable households – provide grants, subsidies, or low-interest loans specifically for households at risk of energy poverty to cover energy renovation costs in MABs.

1.2 Energy advisory services – expand home-based visits and counselling (like the ENSVET model) to guide residents through energy-saving measures, financing options, and participation in renovation programs.

1.3 Integration of social measures into renovation projects – coordinate with social services to combine technical renovations with social support (e.g., bill support, energy literacy training).

1.4 Participatory planning – involve residents of multi-apartment buildings in decision-making to increase awareness, ownership, and acceptance of renovation measures.

1.5 Monitoring and evaluation – track energy poverty indicators pre- and post-renovation to assess the effectiveness of interventions and adjust programs accordingly.

8.2 Priority area 2: Enhancing Energy Efficiency of Buildings

Improving the energy performance of multi-apartment buildings is central to the overall strategy for sustainable development in the region. This includes upgrading building envelopes, modernizing heating and ventilation systems, and implementing smart energy management solutions. Actions should aim to stimulate deep renovations rather than gradual measures, leveraging combined financial instruments, such as grants, loans through reserve funds, and municipal support mechanisms. Equally important is the engagement of residents, property managers, and local contractors to ensure that renovations are technically robust, cost-effective, and socially acceptable. Encouraging aggregation of projects across multiple buildings can increase economies of scale and attract specialized service providers, which are currently limited in the region.

Actions:

2.1 Deep energy renovation packages – promote full-scale upgrades (building envelope, heating systems, ventilation, lighting, common spaces) rather than incremental improvements.

2.2 Financial instruments for multi-apartment buildings – leverage combined schemes, including grants, reserve fund loans, and municipal support, to make renovations feasible for heterogeneous owner groups.

2.3 Aggregation of projects – bundle multiple buildings or neighbourhoods to achieve economies of scale and attract certified contractors.

2.4 Capacity building and technical support – strengthen local contractor networks and provide training for energy auditors, project managers, and building managers to handle complex MAB renovations.

2.5 Use of building renovation passports and digital planning tools – implement phased renovation plans with clear long-term targets for energy performance improvements.

2.6 Quality assurance and maintenance – ensure post-renovation monitoring and maintenance plans are in place to sustain energy savings and prevent building performance gaps.

8.3 Priority area 3: Addressing Cultural Heritage protected areas

Multy-apartment buildings located within cultural heritage protected areas face unique challenges. Renovation works in these areas must balance energy efficiency improvements with preservation of historical and architectural values. Technical constraints, higher costs, and stricter regulatory requirements make these projects more complex than standard MAB renovations. Actions under this priority area should focus on providing clear guidance, tailored financial support, and coordinated assistance while ensuring that interventions preserve the heritage character and benefit all residents, including vulnerable groups.

Actions:

3.1 Development of heritage-compatible renovation guidelines – prepare practical technical guidelines jointly with energy experts and heritage authorities, defining acceptable solutions for insulation, window replacement, roofing, HVAC upgrades, and other interventions suitable for protected buildings.

3.2 Early and structured involvement of heritage authorities (ZVKDS) – ensure early-stage cooperation among building owners, designers, energy advisors, and heritage authorities to align project requirements, reduce the risk of later design changes, and enable efficient project development.

3.3 Tailored financial instruments for heritage MABs – provide enhanced support schemes to cover higher renovation costs, including increased subsidy rates, municipal co-financing, or dedicated national programme calls (e.g., ECO Fund) recognizing heritage constraints.

3.4 Strengthening the role of local energy agencies – empower local agencies such as LEA Spodnje Podravje to provide technical assistance, coordination, and communication

among residents, municipalities, and heritage authorities, with special attention to vulnerable households.

3.5 Focus on measures with high impact and low visual intrusion – prioritize interventions that deliver significant energy savings while preserving protected elements, including roof and attic insulation, energy-efficient windows respecting original design, improved heating systems, ventilation, and system regulation.

3.6 Integration of social and energy policies – combine renovation measures with social support mechanisms to ensure that vulnerable households can participate and benefit, despite higher costs or procedural complexity.

8.4 General recommendations related to the renovation works in the pilot area

To maximize the impact of energy renovations in the pilot area, a set of general recommendations can guide implementation. First, a holistic approach that integrates technical, financial, and social measures should be pursued to ensure that no household is left behind. Second, building renovation passports and long-term maintenance planning should be promoted to sustain energy efficiency gains over time. Third, local authorities and energy agencies should act as facilitators, providing guidance, coordinating stakeholders, and supporting the preparation of aggregated renovation projects. Finally, continuous monitoring and knowledge sharing of pilot projects, both successful and less successful, will be crucial for scaling up initiatives to other municipalities in Slovenia and for informing future national and EU-level policies.

Background of the CEESEN-BENDER project

The main goal of the project "Building intErventions in vulNerable Districts against Energy poveRty" (i.e. CEESEN-BENDER), launched on September 1 2023, is to empower and support vulnerable homeowners and tenants living in buildings built after the Second World War and before 1990's in 5 CEE countries: Croatia, Slovenia, Estonia, Poland, and Romania. The project will help them through the renovation process by identifying the main obstacles and creating trustworthy support services that include homeowners, their associations, and building managers. Coordinated by Society for Sustainable Development Design (DOOR), the project CEESEN-BENDER brings together leading European researchers and experts in field from six countries: Croatia (Society for Sustainable Development Design / DOOR, Medjimurje Energy Agency Ltd. / MENEA, EUROLAND Ltd. / Euroland, GP STANORAD Ltd. / GP STANORAD), Estonia (University of Tartu / UTARTU, Tartu Regional Energy Agency / TREA, The Estonian Union of Co-operative Housing Associations / EKYL), Slovenia (Local Energy Agency Spodnje Podravje / LEASP), Romania (Alba Local Energy Agency / ALEA, Municipality of Alba Iulia / ALBA IULIA), Poland (Mazovia Energy Agency / MAE, Housing Cooperative Warszawska Spółdzielnia Mieszkaniowa - The Warsaw Housing Cooperative / WSM), Germany (Climate Alliance) in addition to Central Eastern European Sustainable Energy Network (CEESEN). The project CEESEN-BENDER is carried out from September 2023 until August 2026 and has a total budget of €1,85 million, of which €1,75 million is funded from the European Union's Programme for the Environment and Climate Action (LIFE 2021-2027) under grant agreement n° LIFE 101120994. As stated, the main objective of CEESEN-BENDER is to empower and support vulnerable homeowners and renters living in multiapartment buildings (MABs) through the renovation process by identifying the main obstacles, and creating trustworthy support services that include homeowners, their associations, and building managers.

Therefore, the detailed objectives for CEESEN-BENDER are stated below:

- The project will analyse the ownership structure and physical characteristics of buildings in the pilot sites in targeted regions to comprehensively understand the obstacles that impede or halt homeowner associations, landlords, and property managers from pursuing energy renovations.
- Project partners will identify both legislation and financial, and technical administrative obstacles for the renovation in pilot countries. The identification of obstacles from the homeowners' perspective will help the creation of tailor-made solutions not only for homeowners but also for building managers, landlords, municipalities and other relevant stakeholders involved in the renovation process.
- Through the project, methods and tools that can be used to address different aspects of energy poverty will be developed. This includes:
    - Data gathering on energy poverty in the pilot sites;
    - A digital tool identifying buildings with high levels of energy poor households in the greatest need of renovation;
    - A model of potential savings in buildings undergoing renovation, and a tool for calculating the return on investment for energy renovations.

- 5 Pilot area roadmaps will be developed that prioritize building renovation based on their potential for maximizing emissions reduction via energy savings as well as an increase of quality of life and wellbeing for vulnerable homeowners.
- Within the 5 pilot areas, at least 30 building-level roadmaps will be created that specify the technical details for renovations. These pilot buildings will be supported in the entire pre-construction phase, drawing of plans, applying for permits, audits or other requirements and for financing. Plans will call for the decarbonization of the heating and cooling supply and integration of renewable energy sources (RES), to produce energy to cover its own consumption.
- Furthermore, a support system for homeowners, municipalities, and other large owners of multi apartment buildings (MABs) in targeted regions will be created to speed up the renovation process, by:
    - Advising at least 3.500 homeowners, landlords and building managers on legal, financial, technical and other aspects of energy renovations.
    - Advocating for changes of regulatory requirements and policies to lower the costs and time needed for the preparatory phase of projects.
    - Train at least 30 energy professionals on energy poverty and related topics.

Co-funded by the European Union

The CEESEN-BENDER project has received funding from the European Union's Programme for the Environment and Climate Action (LIFE 2021-2027) under grant agreement no LIFE 101120994. The information and views set out in this material are those of the author(s) and do not necessarily reflect the official opinion of the European Union or CINEA. Neither the European Union nor the granting authority can be held responsible for them.