CEESEN-BENDER

Building intErventions in vulNerable Districts against

Energy poveRty

Deliverable *3.1*

Synthesis Report on building renovation barriers in regulatory framework in Central Eastern European Countries.

Dissemination Level: Public

WP3 Tackling the barriers hindering building related interventions in vulnerable districts

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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.

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Executive Summary

This report is a synthesis of the results from the analysis of relevant national regulations on multi apartment buildings' (MABs) renovation in the context of energy poor households in Central and Eastern Europe (CEE). It is based on the policy briefs prepared in the framework of the CEESEN-BENDER project for Croatia, Estonia, Poland, Romania, and Slovenia. The synthesis of the national policy briefs is complemented by the insights from the existing research.

The Report follows the unified framework used in the policy recommendations that classified the regulatory barriers according to:

- Targets for energy efficient renovations of MABs and energy poverty alleviation in MABs on the national level;
- National measures for energy efficient renovations of MABs and energy poverty alleviation in MABs;
- Implementation and monitoring processes for energy efficient renovations and energy poverty alleviation in MABs.

A special focus was dedicated to the barriers related to public calls in the CEE region as they are crucial for the building renovation process support. The report finishes with the synthesis of the policy recommendations for the CEE region based on the challenges highlighted in the national policy briefs.

Based on the identified barriers the policy briefs of CEESEN-BENDER project identified the following policy recommendations:

1. **The design of support programs for building renovation should be improved**. Particularly allocation criteria, program monitoring, and transparency should be elaborated with appropriate care for energy poor and vulnerable households. It is furthermore important to ensure sufficient awareness among the energy-poor population for the availability of support options. The application procedures should allow enough time to prepare the application, they must be inclusive and accountable to the vulnerable population groups, offering support to those who lack the capacity to prepare competitive applications. The entire design of support allocation criteria should be based on the needs assessment and strategic choices, rather than pure competition. In order to design an effective support programme, it is essential to have high-quality data, which is crucial for making strategic decisions and planning.

2. There is a need **to ensure effective mechanisms for building energy data collection and storage** in the CEE countries. The national databases should aim to cover a bigger share of the building stock. The establishment of a national

strategy or overarching plan for data collection, storage and effective use is essential. Such a plan would enable the timely delivery of high-quality information to stakeholders, particularly policymakers. The transparency of calculation methods for the building energy performance should be ensured, which allows translation into a common calculation scheme, allowing comparisons with other countries in the region.

3. **The integration of Renewable Energy Sources (RES) should be highly supported** for MABs renovation projects as one of the strategies contributing to the achievement of decarbonization goals in the building sector. Legislative support is needed to stimulate more ambitious renovation projects involving RES. A key aspect of facilitating RES integration is the decentralisation of energy systems, empowering individuals with greater autonomy and self-governance over their own energy production and consumption. The good practices of RES integration that managed to overcome technical and financial barriers should be showcased to stimulate the political will and build stakeholder trust to new solutions. The sufficient awareness level among the residents and other stakeholders should be ensured by national and local awareness-raising campaigns, tailored to the vulnerable population groups as well. A new framework for energy transition governance that is motivated by an inclusive, and reflective view of collective action is necessary to achieve the scale of action needed for CEE countries.

4. **Participation and partnership principles should be offered and respected** for the policy design and implementation in CEE countries. Public awareness and support for the existing citizen-led initiatives will enable them to capitalise on and scale-up the good practices from the local communities.

1. Relevance of this Deliverable

This Deliverable D3.1 – **Report on building renovation barriers in regulatory framework in CEE** is based on the results of the analysis of the national regulations on MABs renovation in the context of energy-poor households in Central and Eastern Europe. The report is part of the project efforts to tackle the barriers hindering building related interventions in vulnerable districts. The Deliverable covers the CEESEN-BENDER project countries for Croatia, Estonia, Poland, Romania, and Slovenia.

The synthesis report is relevant since it presents the bigger picture of energy poverty and building renovation status in the CEE region, highlighting the shared challenges and providing policy recommendations which relevance goes beyond the national contexts.

2. Introduction

The Central and Eastern European (CEE) region faces similar challenges in many areas, largely due to the shared legacy that significantly affects the building stock's condition and ownership. Post-war period came with severe shortage of dwellings combined with the rapid growth in population and increasing pace of urbanisation led to the construction of large apartment blocks across Europe, but systemic and political factors ensured that they developed on the largest scale in the Eastern Bloc[1]. This building stock was characterised by low energy efficiency. The privatisation era led to a significant increase in the percentage of ownership in CEE countries, making shared decision-making complex. The building stock's structural condition deteriorated over time. Energy prices have increased, a contributing factor to the rise in cases of energy poverty in these buildings.[2] Studies on energy poverty in the EU measured by indirect metrics confirm that Central and Eastern European countries are affected by this problem to a greater extent than other countries[3] [4]. The region is also known for invisible energy poverty. Many households living in MABs face significant socio-economic challenges, making it difficult to make ends meet and thus forced to prioritise basic needs. Consequently, they cannot afford to heat or cool their living

[1] Szafrańska, E. (2015). Transformations of large housing estates in Central and Eastern Europe after the collapse of communism. Retrieved from http://rcin.org.pl/igipz/Content/57337/PDF/WA51_77990_r2015-t88-no4_G-Polonica-Szafransk.pdf

[2] Mišík, M., Oravcová, V. & Vicenová, R. Energy efficiency of buildings in Central and Eastern Europe: room for improvement. *Energy Efficiency* **17**, 32 (2024). https://doi.org/10.1007/s12053-024-10215-y

[3] S. Bouzarovski, Energy poverty in the European Union: Landscapes of vulnerability, WIRES Energy Environ. 3 (3) (2014) 276–289, https://doi.org/10.1002/wene.89.

[4] S. Bouzarovski, S. Tirado-Herrero, The energy divide: Integrating energy transitions, regional inequalities and poverty trends in the European Union, Eur. Urban Reg. Stud. 24 (1) (2017) 69–86, https://doi.org/10.1177/0969776415596449.

spaces to comfortable indoor temperatures. **It is estimated that on average 23.57% of the Central and Eastern European population is exposed to hidden energy poverty**[5].

The first group of barriers for energy-efficient renovations and energy poverty alleviation in MABs is related to setting the targets. Although the Recast Energy Performance of Buildings Directive (EPBD) requires all EU Member States to set targets for building renovation, the specific circumstances of the Central Eastern European region make this difficult. The structure of ownership is one of the main obstacles for setting required targets. MABs built after WWII were mainly in public, cooperative or some other type of communal ownership, but after the regime change - many communally owned buildings became privately owned by their previous tenants. These changes in the ownership are now causing difficulties in the renovation process, what prevents the existing building stock from being brought into line with decarbonisation targets. In order to set targets and understand the status quo, it is paramount to make sufficient quality of data available. The challenges that persistently hinder progress in this field include **the unreliable building stock and energy poverty data**, restricted or complex access to data, the lack of data at lower levels or scales, and the provision of necessary protection for sensitive data such as energy consumption. The lack of reliable data is preventing policy makers from defining policy priorities. This is closely linked to the next challenge, which is t**he insufficient prioritisation** of building renovation and energy poverty in CEE. The regulatory and administrative barriers as well as the further need for capacity-building of public administrations to address the energy-inefficient building stock in CEE hinder the policy prioritisation. Capacity to meet targets to a big extent is determined by the availability of **financing that is insufficient** in CEE to match the scale of the needed effort.

The second group of barriers is linked to the national measures for energy-efficient renovations and energy poverty alleviation. In CEE countries there is a problem of **recognising and addressing energy poverty** as a major policy priority. Although energy poverty is defined in most CEE countries in national legislation or in key strategic policy documents, the targeted and coordinated action for vulnerable population groups is still insufficient. Energy poverty is often addressed at a general level, without a differentiation among social groups and building types.

The involvement of local and regional governments is crucial for avoiding national generalisations and for responding to local needs in the most effective way.

In CEE countries multiple **local and regional governments lack the resources and capacity** to cope with the scale of the existing challenges. In addition, the

[5] L. Karpinska, S. Śmiech, Invisible energy poverty? Analysing housing costs in Central and Eastern Europe, (2020), https://doi.org/10.1016/j.erss.2020.101670

fragmentation of institutional responsibilities requires better coordination and information sharing to inform policy making and for more effective policy implementation. In CEE countries, despite the comprehensive measures outlined in their key policy documents, **significant financial gaps remain**, particularly for financing deep renovations. This introduces uncertainty in the possibility of implementation of devised measures. The requirements related to energy efficiency in buildings in many CEE countries are costly to implement which creates a vacuum between the necessity to fulfill the commitments and the inability to cover the financial expenditure.

The third group of barriers concern the **implementation and monitoring processes** for energy-efficient renovations and energy poverty alleviation in MABs. The **results** of the renovation and energy poverty actions **were not properly reported and published** in many CEE countries, although some measures have been taken. The analysis of the outcomes of this type of intervention is crucial for evaluating the effectiveness of the renovation strategies and for future policy planning. The **lack of support of the citizens-led energy initiatives as well as the limited involvement of the key social actors** hinders the successful implementation of the targeted policy measure. The mobilisation of energy initiatives and the involvement of social actors are meaningful contributions for energy poverty alleviation since they are driven by the people themselves and provide necessary complementarity to the top-down actions. The implementation and monitoring processes in the CEE region are **affected by the support options' design, which does not explicitly address the just transition and social inclusion principles for energy-efficient renovation of MABs**. In some cases, the comprehensive social criteria to define energy poverty in the key policy documents as well as to determine the support are restricted solely to income status, which is insufficient to address the multifaceted issue of energy poverty.

The fourth group of barriers concerned the public calls for energy-efficient renovations and energy poverty alleviation in MABs. In many CEE countries **complex administrative requirements and procedural barriers** discourage potential applicants, especially building managers and co-owners who often lack the necessary expertise or experience in managing energy projects. Public calls often have **strictly defined criteria that may exclude many buildings** that are also in need of renovation from the application process. The **application processing also often lacks transparency and clarity** which deters the applicant's trust even more. It is often the case that data relating to public calls is inaccessible, which hinders the ability to assess the effectiveness and uptake of such calls. Without accurate data, it is challenging to identify trends, evaluate the success of the programs, and make informed decisions for future improvements. It also reduces the ability to hold the program accountable and ensure that funds are being used efficiently. In many cases these **support**

programs were not tailored or designed with accountability to the vulnerable population groups including the energy poor.

The integration of Renewable Energy Sources (RES) remains challenging as the public calls do not support renewable energy integration sufficiently. Some of the existing programs primarily focus on traditional energy-saving measures, with **limited emphasis on integrating renewable energy solutions.** Despite the regulation in many CEE countries that permit the installation of the RES in MABs, the technical obstacles and complexity of installing renewable energy systems can still be a barrier. In the CEE region, public calls for funding for building renovation frequently have limited availability of grant money, which is not sufficient to meet the needs of all interested applicants. **The lack of tailored financing instruments** for low-income owners and their **inability to co-financing** also hinders the effective use of the available grant money, as if many owners from MAB can not pay back an eventual loan on top of energy bills or afford the upfront capital for renovation.

3. Barriers Related to Targets for Energy Renovations and Energy Poverty Alleviation in MABs in Central Eastern European Countries

The first area related to energy renovation in MABs and energy poverty alleviation evaluated the national targets in the CEE region against the following criteria, whether they are:

- Sufficiently **ambitious and prioritised** in the national planning for the energy transition;
- Based on **comprehensive data and appropriate methodologies** for the wide-scale baseline analysis and tracking of the national building stock and energy poverty on a national level;
- **Coherent** across the relevant legislation and policies **as well as compatible** with other targets relevant to the energy transition in the country.

Setting energy renovation targets for MABs is a rather challenging policy, not only in CEE countries but in the EU in general, as it requires a comprehensive overview of the building stock, political commitment and sufficient identification of the building stock to be targeted. The new EPBD requires the Member States to set their own national building renovation targets and define measurable progress indicators in their national building renovation plans, including the reduction of the number of people affected by energy poverty. According to the study of the European Commission[6], only 5 countries in the EU have set targets for energy poverty to date, out of which 2 represent the Central Eastern European region: Latvia and Lithuania.

Based on the analysis of the regulatory framework in the 5 CEESEN-BENDER partner countries, and the review of the additional literature, four main categories of barriers to setting energy efficiency targets were identified:

1. challenging historical context of the building stock,
2. unreliable data about the building stock,
3. lack of policy prioritisation,
4. financing.

3.1 Challenging Historical Context of the Building Stock

CEE countries share the legacy of the large housing estates that were constructed during the Soviet era which poses specific challenges today. Many multi apartment

[6] European Commission: Directorate-General for Energy, *Study on optimisation of energy poverty indicators collected at EU and national level – Final report*, Publications Office of the European Union, 2024, https://data.europa.eu/doi/10.2833/6627986

buildings in the region were built using uniform solutions and similar standards. However, the regional differences should be acknowledged, such as diverse climatic conditions and related challenges, materials used for building construction and different reform paths that were taken after the regime change. These buildings today are very energy inefficient, which is linked to the tough conditions and the initial design. However, this does not mean that the context of each country is identical; there are differences in climatic conditions, economic development trajectories, political priorities, renovation support and efforts, energy mix, heating or cooling demand and ownership structure.

The legacy of individual apartment ownership structures poses additional challenges for building-related decision-making, making it difficult to reach an agreement among the majority of the owners. The current context and the characteristics of the building stock hinder the implementation of modern energy efficiency requirements and thus prevent the existing building stock from being brought into line with decarbonisation targets.

3.2 Unreliable Building Stock and Energy Poverty Data

Data availability and quality determine policy planning and provide policymakers the insights to recognise a problematic policy issue. The accessible, up-to-date, and reliable data about the existing building stock is a necessity for evidence-based policy planning and implementation. The data collection practices and quality vary significantly across the different national contexts.

This issue has been recognized before and facilitated the establishment of the EU Building Stock Observatory by the European Commission to monitor the improvement of the energy performance of buildings across Europe.

Using outdated data sources for the current policy planning and future energy performance targets undermines the effectiveness and accuracy of the renovation plans. The reliance on data from old Censuses or outdated policy documents about the building stock does not allow the policy to correspond to the current realities. The data collection practices and quality were also found to vary across the regions in bigger CEE countries, which also contributes to the growing inconsistencies in the national building stock evaluation.

The absence of reliable data or unreliable data collection practices related to energy poverty-related aspects is also observed in some CEE countries. As a result, the complete lack of official and relevant statistics on energy poverty prevents direct and accurate identification and planning of energy poverty interventions in MABs.

According to the European Commission study[7], the Member State's ability to capture energy poverty is based on the parameters of whether the Member State:

- Has a definition for energy poverty;
- Uses indicators in official EU reporting;
- Has a national energy poverty observatory (or equivalent);
- Has an (above) average rating for EU harmonised indicators (based on mapping in this study);
- Has an (above) average rating for alternative indicators (based on mapping in this study).

Based on these parameters, each Member State is assessed as having limited/ basic, intermediate, or advanced ability to capture energy poverty. The countries of the CEE region are mostly classified as having intermediate or limited/basic ability. The CEESEN-BENDER policy briefs'[8] analysis in CEE also highlighted the lack of transparency in the collected data, especially through surveys, which are used as baseline analysis in programs aimed at addressing energy poverty. Lack of comprehensive analysis or the data collected on the smaller levels (e.g. individual building, household) does not allow vulnerable household detection, as well as the detection of the worst-performing building stock.

Another important issue is data accessibility, which is observed in some countries of CEE, despite the data even being available, the regulation or absence of publically available, user-friendly platforms hinders the public use of the data. The existence of EPC databases should contribute to better data availability. However, it is still the case that EPCs do not cover the entire building stock and are over-represented in new buildings. Another aspect of energy data is its sensitivity. To avoid misuse, data on the energy consumption of a household or an individual building should be protected.

Article 22 of the European Energy Performance of Buildings Directive (EPBD) requires member states to set up a national database for the energy performance of buildings which will cover data on the energy performance of individual buildings and on the overall energy performance of the national building stock. The aggregated and anonymised data of building stock will be made publicly available. This should

[7] European Commission: Directorate-General for Energy, *Study on optimisation of energy poverty indicators collected at EU and national level – Final report*, Publications Office of the European Union, 2024, https://data.europa.eu/doi/10.2833/6627986

[8]

improve the situation in the future when the CEE Member States transpose the EPBD in national legislation and proceed with implementation.

3.3 Lack of Policy Prioritisation

Political will and perceived importance are key to achieving coordinated action. The lack of insufficient prioritization of building renovation and energy poverty alleviation is observed across several CEE countries. Decarbonization efforts are also referred to as inconsistent across the region[9].

The presence of regulatory and administrative barriers as well as the insufficient capacity of the public administrations to address the energy-inefficient building stock in CEE also hinder the policy prioritisation. Additionally, there are cases of underperforming renovations, which are referred to as renovation efforts that do not achieve the full potential of energy savings. The reason for this is a combination of challenges such as inconsistent regulatory framework, lack of monitoring, and difficulties in building energy data collection.[10]

The lack of policy prioritisation is also closely tied to the challenge of lacking good quality data without which it is difficult to define the priorities. The transposition of the recast EPBD and its implementation should alter this state since the ambitious targets set for the energy performance of the building stock should be met by implementing the Directive. Meeting those targets requires political commitment and sufficient policy prioritization.

3.4 Insufficient Financing to Meet the Energy Renovation Targets

The targets for building renovation in CEE are often set by the national plans and Long Term Renovation Strategies (LTRSs) that will be replaced by the building renovation plans. The common problem observed is the lack of capacity to meet these targets linked with the financing of building renovation plans.

The grant reliance is common for the CEE region, however, grant-based instruments do not represent a sustainable financing approach. The grant budget is limited and cannot match the needed effort to achieve the targets set. The renovations are often co-financed by grants from national institutions and development bank loans. However, owners in CEE countries often have challenging socio-economic situations that do not allow the credit capacity for the renovation loan[11]. In other cases, renovation is linked with the high upfront investment costs which is not possible for the

[9] Energy Policy Group (2024), Underperforming Renovations in the CEE Region: Challenges and Recommendations
[10] Energy Policy Group (2024), Underperforming Renovations in the CEE Region: Challenges and Recommendations
[11] Energy Policy Group (2024), Underperforming Renovations in the CEE Region: Challenges and Recommendations

owners. Additionally, the cost-effectiveness of deep renovation projects represents a challenge, especially from the perspective of the achievement of the energy performance targets. Deep renovation projects may appear not cost-effective which will prevent them from being financed. Building renovation projects are often linked with longer payback periods, which is an additional obstacle for the incentive of all parties. The short-term business models with faster returns and shorter payback periods make it harder for deep renovation to remain competitive. Although building types in CEE often appear standardised, energy efficiency measures and how they are financed remain difficult to aggregate and unify. Lack of predictability, potential gaps between projected and actual energy saving, high transaction costs, and different conditions of the building.

The funds, grant distribution, and application processes are an additional barrier. In some cases, the funds are distributed based on the application procedures and competition leaving the municipalities or population groups that lack knowledge or administrative capacity to prepare the application. Also, in some countries the funds are distributed based on the requests of the municipalities instead of the analysis and planning of the targeted action, this once again leads to the fact that funds go to the stronger municipalities with better capacities. There are also cases of funds distribution based on the "first-come first-serve" approach, which leads to the situation that even if there were multiple successful applications, the ones who manage to be submitted first will receive a grant. The uneven funds distribution also leads to the clustering of the resources in the stronger regions and municipalities while worsening the position of the weaker ones.

Multiple funds are mobilised to support the CEE in the financing of building renovation projects. Cohesion policy funds are aimed at regional development, investment in people, and the reduction of economic, social, and territorial disparities between EU regions. According to Renovate Europe Campaign study[12], in the current financial framework 2021-2027, out of 297 programs across the 27 member states are funded by the ERDF, CF, and JTF. 175 of these programs include investments in renovation and energy efficiency. It was found that Member states have prioritised public sector investment in their planning. Public sector infrastructure attracts the highest share of funding (53% of funding for energy-efficient renovation), followed by the renovation of the residential housing stock (32%) and support for businesses subject to energy efficiency requirements (14%). According to the European Commission, Cohesion Policy Funds have contributed around €17 billion for the energy performance of buildings. The actions included investments in insulation and heat recovery, light optimisation, and digitalisation of buildings' systems.

[12] Renovate Europe. (April, 2023). 2021-2027 Cohesion policy support for energy efficiency and building renovation

4. Barriers Related to National Measures for Energy Renovations and Energy Poverty Alleviation in MABs

The second area of barriers refers to national measures for energy-efficient renovations of MABs and energy poverty alleviation in MABs in the CEE region. It was considered whether the measures are:

- Appropriate and comprehensive enough given the specific national context and, to this end, developed in an inclusive manner as a result of social dialogue with key stakeholders;
- Sufficiently address the importance of energy-efficient renovation of MABs and energy poverty alleviation in MABs at local and/or regional level;
- Recognise vulnerable social groups at all levels and specifically address energy poverty in multi apartment buildings.

The national measures related to energy renovation and energy poverty alleviation define the coordinated efforts to target both building stock and vulnerable groups. Within the CEE countries, the main barriers related to national measures were:

- addressing energy poverty at a sufficient level,
- lack of capacity,
- and involvement of the regional and local governments.

4.1 Addressing Energy Poverty

In the CEE countries there is a problem of recognising energy poverty as a major policy priority.

Although energy poverty is defined in the case of most CEE countries is defined in the national legislation or in key strategic policy documents such as the Long Term Renovation Strategy (LTRS) or the National Energy and Climate Plan (NECP), national energy strategies, the targeted and coordinated action for vulnerable population groups is still insufficient.

The definition of energy poverty is crucial because it reflects the complex mix of socio-economic factors within different national contexts and varied approaches in terms of strategies, measures, actions, and plans. Additionally, it also defines the criteria for determining energy-poor co-owners in MABs, a prerequisite for efficient development and implementation of measures. The issue of data availability is also of particular importance since the intensity and scope of energy poverty is better understood through the more comprehensive indicators and criteria.

Another aspect is the definition of strategies for addressing energy poverty in MABs. In many CEE countries, there is no coordinated action beyond the social welfare system

that would target energy poverty specifically in MABs. Energy poverty is often addressed at a general level, without a differentiation between the social groups and building types.

According to the Commission study[13], all the EU countries that have a definition of energy poverty mention the inability to meet basic needs[14] as a part of their definition. This implies e.g. when a household must reduce its energy consumption to a degree that negatively impacts the inhabitants' health and wellbeing. This also implies the situation that in order to afford the energy costs spending on other primary needs such as food should be restricted. However, when it comes to policy implementation, a more detailed overview is required. Insufficient ground-level energy poverty data hampers the connection between renovation measures and energy poverty alleviation, limiting the integration of energy poverty criteria in the allocation and distribution of renovation financing. Addressing energy poverty means also addressing its factors, energy poverty is not solely determined by low income but influenced by many factors, including housing conditions, energy efficiency of the buildings where energy-poor households live in, and household expenditure on energy. In some countries of CEE, there is also a lack of consideration of those factors in the legislation as well as no recommendations provided to address this topic.

4.2. Insufficient Capacity and Involvement of the Local and Regional Government

The active involvement of the local and regional government is essential for the effective implementation of the plans and goals related to energy efficiency of the building stock and energy poverty. However, in some CEE countries, the role of these levels of government is not so strong. In some cases, they have no designated role or budget for the local-level implementation of the measures to assist the renovation process of MABs.

Multiple governments at the local and regional levels in CEE countries cannot work on energy poverty and building energy efficiency due to a lack of resources and capacity to cope with the scale of the existing challenges. In addition, the fragmentation of institutional responsibilities requires better coordination and information sharing for more effective policy implementation.

[13] European Commission: Directorate-General for Energy, *Study on optimisation of energy poverty indicators collected at EU and national level – Final report*, Publications Office of the European Union, 2024, https://data.europa.eu/doi/10.2833/6627986

[14] According to the Principle 20 of the European Pillar of Social Rights everyone has the right to access essential services of good quality which includes: water, sanitation, energy, transport, digital communications, financial services.

Fulfilling the ambitious national targets remains a challenge for regional and local governments. The national-level policies often lack consideration of the differences between regions and municipalities in terms of both capacity and availability of resources to cope with the problem. This divergence is also visible when it comes to the distribution of funding targeting the renovation of MABs. Currently, the distribution of EU Cohesion funds is done through a shared management approach, which implies cooperation between the Commission and managing authorities who are responsible for the preparation of the programs and actions that will be financed. Managing authorities were also responsible for preparing partnership agreements and involving the different stakeholders including regional and municipal governments in the preparation of the program, consultation, and monitoring. Managing authorities vary from country to country, in some cases, it would be ministries, regional governments, energy agencies, etc. In some CEE countries, one of the challenges is that managing authorities do not provide or enforce specific selection methodologies for municipalities, resulting in inconsistencies in addressing energy poverty through MAB renovations.

The lack of resources available to the local governments also prevents the local plans from effectively implementing the target measures. The imbalance in capacity leads to the situation that renovation processes have predominantly occurred in bigger towns, leaving rural and lower-income areas underserved. The relationship between national and local governments is another important factor. If there is a lack of coordination, local and regional action becomes more difficult. When national governments change, the resulting power vacuum also tends to delay the effective implementation of local policies.

4.3 Financial Obstacles to the Implementation of the Measures

The financial aspect of the energy efficiency measures and addressing energy poverty remains the determining factor for the policy implementation. In CEE countries, despite the comprehensive measures outlined in their key policy documents, significant financial gaps remain, particularly for financing deep renovations. This introduces uncertainty in the possibility of implementation of devised measures. The requirements related to energy efficiency in buildings in many CEE countries are costly to implement which creates a vacuum between the necessity to fulfill the commitments and the inability to cover the financial expenditure. The absence of financial instruments that would enable low-income residents to access renovation funds is often exacerbated by complex bureaucratic procedures and a lack of technical expertise, which collectively hinder effective participation and project execution. Lack of tailored financial support for energy-poor households also contributes to the growing gap between available public funding and the needs identified in the key strategic documents.

5. Barriers Related to Implementation and Monitoring Processes for Energy Renovations and Energy Poverty Alleviation in MABs

The last of the analysed of national policies was related to potential barriers in the process of implementing and monitoring the measures for energy-efficient renovations and energy poverty alleviation in MABs in CEE. This mainly refers to the assessment of:

- Governing bodies overseeing the implementation and monitoring of measures as well as the transparency and efficiency of the implementation and monitoring processes;
- Available national financial instruments and mechanisms in the partner country and the perceived gaps between the necessary and available public resources for implementation;
- Just transition and social inclusion elements in the planning and implementation of measures;
- The role of citizen energy initiatives in energy building renovations of MABs and energy poverty alleviation in MABs.

Transparency and monitoring is key to any successful policy implementation. In the CEE countries the key barriers related to implementation and monitoring processes for energy efficient renovations and energy poverty alleviation in MABs are:

- inconsistencies and insufficient reporting,
- lack of involvement of key social actors and citizen's initiatives,
- not comprehensive inclusion principles,
- and support options design.

5.1 Inconsistent and Insufficient Reporting

In many countries in Central and Eastern Europe, although some measures have been taken to renovate buildings or to fight energy poverty, the results have not been published. The outcomes of this type of intervention are crucial for evaluating the effectiveness of the renovation strategies and deciding on future policy planning. Reporting the results also helps to identify the real impact of the renovation strategies and to have a better understanding of the costs involved, the gaps between projected and actual energy savings, the project implementation time, and the possibilities for process improvement and optimisation.

Since renovation is important for alleviating energy poverty and also for effective climate action, it should be performance-based, meaning the actual energy savings achieved should be identified, measured and published. Monitoring the building renovation processes is also crucial to ensure that asymmetries between the different stakeholders involved are mitigated. It is common that in the MABs renovation

process, some actors are more powerful due to the knowledge they possess about the technical and legal specifications of MABs and the renovation process. Monitoring of the process, especially on the issue of stakeholder participation, is crucial to correct asymmetries and make the process more inclusive.

Limited public awareness of available schemes, combined with the regulatory complexity, is a significant information hurdle and a barrier to full engagement in energy-efficient renovation. Improving the availability of information to the public could also facilitate renovation, due to increased trust of the residents in the process. The lack of trust in the renovation process is one of the main obstacles to initiating it. Addressing this issue through open public information of the process, presentation of completed projects with results will help to build trust and resolve the hesitations. In some CEE countries, there are some systems in place for tracking energy renovation projects, but they also have room for improvement, as they often lack continuous monitoring of energy savings, have limited user accessibility, and have limited coverage of renovation projects (mostly for grant-funded projects).

5.2 Involvement of Key Social Actors and Citizens' Initiatives

Citizens' energy initiatives such as energy communities tend to be either not acknowledged or relatively underdeveloped in some CEE countries[15]. The Renewable Energy Directive requires Member States to propose an enabling framework for renewable energy communities. However, in most CEE countries according to The Life COMET enabling frameworks are missing (Croatia, Poland, Estonia), have not been translated into concrete measures (Slovenia, Romania) or are incomplete (Greece, Hungary).

The mobilisation of such energy initiatives can appear as a meaningful contribution for energy poverty alleviation since it is driven by the people themselves and represents a bottom-up approach. These initiatives also promote energy citizenship as people can expand their agency around energy from being passive consumers to more active energy prosumers. Integration of such initiatives into the broader strategies for energy poverty alleviation is also important because the complementarity of different actions has a bigger impact. Energy citizenship is also expressed through the participation and opportunity to shape the policies. In CEE countries the social dialogue and public participation in the definition of policy priorities, methods, and strategies related to building renovation and energy poverty remain to be improved. The limited mobilisation of other key actors who can contribute to better policy design and implementation is also a consequence of the lack of participation.

[15] Cik, T., Eppert, M., Laurentiu, M. (2024). Report on building renovation barriers in regulatory framework in Romania. Society for Sustainable Development Design (DOOR), HR; Alba Local Energy Agency (ALEA), RO: CEESEN-BENDER Project. Retrieved from www.ceesen.org

5.3. Inclusion Principles in the Support Options Design

When it comes to the policy design for MABs renovation and energy poverty, the criteria that defines the target groups as well as guiding principles gains special importance. Our analysis found that in some CEE countries, the key strategic policy documents are not explicit on the just transition and social inclusion principles for energy efficient renovation of MABs. In some cases, the comprehensive social criteria are limited only to income status which is not enough to cover the complex issue of energy poverty. Additionally, energy poverty is also present across households that are not classified as low-income households (hidden energy poverty). The definition of the criteria for classification as energy-poor should be inclusive and comprehensive to ensure the target group is extensively covered. There are multiple indicators used to map energy poverty that can be identified as[16]:

- Household expenditure-based indicators
- Household self-reported indicators
- Multidimensional indicators
- Indirect indicators (comprising prices, incomes etc. – where energy poverty is not measured directly)

These EU indicators[17] can be used to identify energy poverty and also cover the phenomenon of hidden energy poverty.

Furthermore, it is suggested to consider the principles of fairness for distribution issues. The following factors should always be considered as a combination and not only as single measures to ensure fair distribution involving energy-poor households:

- income support,
- energy price adjustment,
- reducing energy consumption and emissions,
- a mix of instruments for success: promoting and challenging, with a focus on transformation,
- increase the rate and depth of renovation, don't just focus on energy carrier (eg. gas vs renewables).
- social aspects: tailor measures to specific target groups: both homeowners and tenants.

[16] European Commission: Directorate-General for Energy, *Study on optimisation of energy poverty indicators collected at EU and national level – Final report*, Publications Office of the European Union, 2024, https://data.europa.eu/doi/10.2833/6627986

[17] European Commission: Directorate-General for Energy, *Study on optimisation of energy poverty indicators collected at EU and national level – Final report*, Publications Office of the European Union, 2024, https://data.europa.eu/doi/10.2833/6627986

6. Barriers Related to Public Calls to Energy Renovations of MABs

The given section considers the public calls available in CEE countries and highlights the barriers to its effectiveness. The barriers identified are: the complexity of administrative procedures and application eligibility criteria, transparency in the application and approval process, insufficient support for the vulnerable groups, complexity for renewable energy integration, co-financing, and availability of financial instruments.

6.1 Complexity of Administrative Procedures and Application Eligibility Criteria

In many CEE countries complex administrative requirements and procedural barriers may discourage applicants, especially building managers and co-owners who often lack the necessary expertise or experience in managing energy projects. These factors can lead to procedural errors and a decrease in the number of successful applications. The lack of capacity of the actors submitting the applications often leads to even underutilization of the available funds, since the preparation of the application also requires upfront investment in the sense of time, expertise, and knowledge. The information on these calls is often not presented in an applicant-friendly way, or in many cases, even the possibility of applying for such support is not widely known.

An additional problem in the MABs is that in CEE countries high ownership rates hampers the decision-making process. In some countries, at least 50% of co-owners must agree to proceed with the application, which can be difficult to achieve in multiapartment buildings due to varying interests and priorities. This requirement can delay or prevent the initiation of renovation projects, particularly in buildings with a large number of co-owners or where there is disagreement among them.

Public calls can also have strictly defined criteria that may exclude many buildings that are also in need of renovation from the application process. Also, the need for the majority of apartment owners to agree on renovation projects can be difficult to achieve, leading to delays or the inability to apply for grants. Another example is the restricted eligibility to municipalities to manage and implement renovation projects. While this can ensure alignment with urban development plans, it may also introduce bureaucratic complexities and slow down project approval. The conditional approval for certain renovation activities may also discourage the applicants or lead to the partial renovation and prioritisation of the subsidised measure instead of the comprehensive approach and the best measure selection.

The application submission process may also be problematic and cause frustration in some cases. Reduction in the number of applications might not only reflect stricter

requirements but also a lack of awareness or capacity to navigate the revised processes. Issues such as processing delays, the lack of information on the duration of application revision, and complaint resolution bring uncertainty and potential delays. Undefined timelines for resolving complaints and signing agreements further contribute to administrative inefficiencies and hinder project planning and execution.

6.2. Transparency in the Application and Approval Process

The application processing also often lacks transparency and clarity which deters the applicant's trust even more. It is essential to ensure that applicants have a clear understanding of the steps involved. Without standardized processing times for all stages of the application and approval process, applicants may experience unpredictable delays. This variability can discourage participation and reduce the perceived reliability of the programs. Another issue faced in CEE countries is a lack of detailed data on the number of applied and approved projects, as well as in some cases even on the total financial resources available. This absence of information hinders the ability to assess the effectiveness and uptake of public calls. Without accurate data, it is challenging to identify trends, evaluate the success of the programs, and make informed decisions for future improvements. It also reduces the ability to hold the program accountable and ensure that funds are being used efficiently. At the same time, stakeholders are unable to fully understand the scope, effectiveness, and fairness of the programs. In CEE countries, the approval rates also lack consistency which leads to a perception of instability or lack of reliability in the program. If stakeholders are unsure whether their projects will be approved, they might hesitate to invest the time and resources needed to apply.

6.3 Insufficient Support for the Vulnerable Groups

The analysis of public call design in CEE has revealed that in many cases these support programs were not tailored or designed with accountability to the energy-poor population. This oversight means that vulnerable groups who might benefit the most from energy efficiency improvements often end up being least capable of accessing them, as applications tend to be time and effort-intensive in preparation. If applied to a regional perspective, some regions have a higher rate of energy-poor households. Without tailored outreach programs and additional support, these areas may continue to lag in energy efficiency improvements, perpetuating regional disparities.

The question of energy poverty definition and criteria for determining mentioned before in 4.1 and 5.3, is also very relevant for the assessment of the public call's effectiveness. If the definition applied is too narrow, then there is no comprehensive capturing of the energy-poor population and tailored support.

6.4 Complexity for Renewable Energy Integration

As the revised EPBD puts more emphasis not only on improving building performance but also on maximizing renewable energy generation. When it comes to public buildings, Member States must also include requirements for the deployment of solar installations in all public buildings, major renovations, and roofs of car parks to ensure that renewable energy generation is maximised. All new buildings must be ready to have solar installations on the rooftop without the need for significant expenditure or renovations and all zero-emission buildings must aim to meet 100% of their primary energy demand from renewables, generated on-site or nearby, where technically feasible. The share of renewable energy in the building sector is also an obligatory indicator for the overview of the building stock in the building renovation plans that will be prepared by Member States to replace Long-Term Renovation Strategies (LTRS). All these requirements as well and the necessity to deliver on climate commitments make it especially relevant to integrate renewable energy into the renovation of the current building stock.

In someCEE countries, the public calls however do not support the renewable energy integration at the appropriate level. Some of the existing programs primarily focus on traditional energy-saving measures, with limited emphasis on integrating renewable energy solutions. This can result in missed opportunities for further reducing energy costs and enhancing sustainability through renewable energy adoption. The upfront costs for renewable energy systems like photovoltaic panels can be high, even with co-financing rates, which may not be enough to make these systems affordable for all applicants. Despite the regulation in many CEE countries that permit the installation of the RES in MABs, the technical requirements and complexity of installing renewable energy systems can be a barrier, particularly for apartment associations lacking expertise in these areas. Additionally, there are also possible technological barriers of the RES integration e.g. the access to grid can be very complex and expensive as well as lack of smart metering and advanced data management systems[18]. In some cases, the performance-based incentives for the renovation projects are lacking. That discourages the appearance of more ambitious projects that achieve higher energy savings or integrate innovative technologies.

6.5 Co-financing and Availability of Financial Instruments

Despite grant money offering significant support, in some CEE countries the percentage of grant money is still not high enough to enable any applicant to apply for the project funding. The grant money does not represent a sustainable financing solution, however, when different co-financing possibilities are available, such as loans it becomes possible for different social groups to go for renovation projects. The problem in many CEE countries is that owners can not access the favorable

[18] Austrian Energy Agency. (2022) Handbook of identified barriers and enablers. https://sharerenewables.eu/

co-financing options (e.g. low-interest loans) to complement the percentage of grant money. The lack of tailored financing instruments for low-income owners also hinders the effective use of the available grant money, as if many owners from MABs can not pay the loan on top of energy bills or afford the upfront capital for renovation projects.

7. Policy Recommendations

After a thorough analysis of the barriers identified in the CEE countries above, the following policy recommendations have been outlined in the policy briefs:

Improve the design of support programs for building renovation by targeted allocation and transparent monitoring

1. Focus support on multiapartment buildings with energy-poor households.
2. Enhance monitoring: Regularly assess outcomes and publish transparent progress reports.
3. Improve transparency: Communicate eligibility in an easy-to-understand manner, streamline and publish application processes well in advance of publication of calls, and always ensure that funding decisions are communicated in time and in a transparent way.

Improve access to data related to building energy performance and energy poverty

1. Create a shared and publicly available digitalised database on building energy performance and energy poverty. Make sure that data input and output is consistent across building data and social data (where data protection allows).

Improve conditions for integrating renewable energy in a building renovation project

1. Offer incentives and guidance for renewable energy integration in renovations.
2. Simplify processes: Streamline applications and reporting for easier participation.
3. Make sure that vulnerable and energy poor households benefit from available opportunities by targeting programmes.

Respect the partnership principle and increase participation

1. Engage Stakeholders: Include municipalities, owners, and residents in programme design.
2. Provide training for municipalities and funding institutions and promote regional knowledge sharing.
3. Inform residents and small businesses of renovation benefits and available support.

7.1 Improve the Design of Support Programs for Building Renovation

The state support programs are crucial to support vulnerable population groups in the improvement of the energy efficiency of their homes, as well as creating incentives and financial possibilities to start renovation processes. In CEE the application process should be made more inclusive.

The first step is to ensure that the energy poor are sufficiently aware of the availability of support. This can be done in many different ways, ranging from communication in online and physical media to the use of posters in the MAB notice boards, depending on what works best to reach the energy poor in the specific national and local context.

Secondly, the application procedures for grants, loans and other support for renovating buildings should be designed to be inclusive, allowing sufficient time and assistance in applying for support for those sections of the population who are not in a position to prepare a competitive application. The whole design of support allocation criteria should be reconsidered and based on needs assessment and strategic choices for future proven results, rather than on a "first come, first served" basis or direct competition, where support is given to population groups that can prepare stronger applications. The criteria for allocating support should take into account the different conditions between applicants in terms of building conditions and socio-economic situation in order to make informed decisions on the allocation and distribution of support.

Designing a fair subsidy scheme may be challenging, thus we suggest to consider following examples of indicators to set up tailored programmes for socially fair conditions:

- The combination of current building energy performance and income level. This would involve assessing the actual energy saving performance of buildings for different income groups; and reallocating current subsidies according to family income.[19]
- Expected improvement of energy performance as a result of the renovation project, compared to the original energy performance. Eg: in Finland "EP-value" (primary energy) of the building was used for the estimation of energy use and energy savings that determined the grant eligibility.[20].
- The combination of socio-economic criteria with energy consumption and technical conditions of buildings. The Covenant of Mayors reporting template can be used for the selection of indicators to diagnose energy poverty. The reporting template is available on the following link: Covenant of Mayors reporting template

[19] Kairui You (et al.), Subsidy allocation for residential building energy retrofit: A perspective of families' incomes, Sustainable Cities and Society. 2024. https://doi.org/10.1016/j.scs.2024.105317.
[20] Hatef Hajian (et al.), Finnish energy renovation subsidies in multifamily apartment buildings: Lessons learnt and best practices. 2024.https://doi.org/10.1016/j.enbuild.2024.113986.

Thirdly, the effectiveness and results of MAB renovation projects should be monitored. Project monitoring should cover several aspects, ranging from transparency and accountability for the use of financial resources to the energy performance achieved, the reduction of CO2 emissions and the assessment of the cost-effectiveness of the project. Monitoring the performance of individual renovation projects would also contribute to better policy planning, as it would be possible to estimate progress towards the targets set in the main national strategic plans. In some CEE countries the monitoring mechanism is already in place, but needs to be improved. The inclusion of feedback mechanisms from residents can be considered as part of the assessment of the building renovation process and results. The monitoring and transparency of refurbishment projects is closely linked to the quality of building data collection and storage mechanisms.

7.2 Improve Access to Data Related to Building Energy Performance and Energy Poverty

There is a need to ensure effective mechanisms for building energy data collection and storage in the CEE countries. An improvement on this field would have a wider impact than better policy planning regarding building renovation: it would contribute to the better diagnosis of energy poverty and the improved data availability on the worst-performing building stock. The granularity of data is worth considering as well, as the regional and municipal level data will be necessary to define the local action priorities.

The necessity of better building data handling was already recognised at the EU level: the implementation of the recast Energy Performance of Buildings Directive (EPBD) requires member states to set up national databases for the energy performance of buildings and transfer information to the EU Building Stock Observatory (BSO) annually.

These national databases should aim to cover a bigger share of the building stock, which is often a challenge since the instruments that help collect data on buildings' energy often cover only a limited share of building stocks (this applies for instance to EPCs). Since the data collection, analysis, and storage require coordinated action, the establishment of a national strategy or overarching plan for data collection, storage and effective use would enable and optimize the timely delivery of high-quality information needed by stakeholders, and particularly policymakers. The calculation methods for the building energy performance should be transparent, i.e. providing all necessary assumptions and inputs for calculations. Additionally, a common calculation scheme would be possible, allowing comparisons with other countries in the region.

7.3 Improve Conditions for Integrating Renewable Rnergy Rources (RES) in a Building Renovation Project

In order to deliver on climate commitments, the decarbonisation of the building sector remains one of the key areas to target. Building decarbonization implies reducing carbon emissions throughout the entire lifecycle of buildings, from design and construction to operation and decommissioning for both new and existing buildings. Beyond energy efficient renovation, the integration of RES to fulfill building energy needs is one of the strategies contributing to the achievement of decarbonization in the building sector[21].

In the CEE region legislative support is needed to stimulate more ambitious MABs renovation projects that would involve RES. The integration of RES can also be considered as the criteria for the applications to receive support for MAB renovation projects. The use of RES to lower carbon dioxide (CO2) emissions is usually the main topic of discussion when it comes to heating systems in the CEE countries. Existing research about the region focuses on the potential for district heating systems (DHS) to become carbon neutral through the utilisation of RES[22]. As renewable energy is more cost effective than natural gas, several studies show[23] [24] that it would have a positive impact on both the environment and the economy. This research shows that in order to enable the efficient use of RES, the replacement or rehabilitation of old district heating pipelines is crucial. In the context of energy poverty, increasing the use and accessibility of RES is seen as a means of reducing household energy expenditure or targeting energy poverty policies at all levels of the energy supply chain.[25].

The energy crisis and climate emergency highlighted the relevance of decentralising energy systems and giving people more energy autonomy and self-governance over their own energy production and consumption. Facilitating the integration of RES gives people an opportunity to become active energy citizens and energy prosumers rather than passive consumers. The revenue generated from renewable energy produced can be channelled back into the community and help address local socio -economic issues, such as supporting the most energy-poor and vulnerable households within the community. Despite the benefits of energy communities, the restrictive regulations

[21] Najafi, H., and González-Cruz, J. E. (November 25, 2024). "Special Issue: Building Decarbonization." ASME. *J. Eng. Sustain. Bldgs. Cities*. November 2024; 5(4): 040201. https://doi.org/10.1115/1.4067143

[22] Mišík, M., Oravcová, V. & Vicenová, R. Energy efficiency of buildings in Central and Eastern Europe: room for improvement. *Energy Efficiency* **17**, 32 (2024). https://doi.org/10.1007/s12053-024-10215-y

[23] Pavičević, M., Novosel, T., Pukšec, T., & Duić, N. (2017). Hourly optimization and sizing of district heating systems considering building refurbishment – Case study for the city of Zagreb. Energy, 137, 1264–1276. https:// doi. org/ 10. 1016/j. energy. 2017. 06. 105

[24] Lacko, R., Drobnič, B., Mori, M., Sekavčnik, M., & Vidmar, M. (2014). Stand-alone renewable combined heat and power system with hydrogen technologies for household application. Energy, 77, 164–170. https:// doi. org/ 10. 1016/j. energy. 2014. 05. 110

[25] Mišík, M., Oravcová, V. & Vicenová, R. Energy efficiency of buildings in Central and Eastern Europe: room for improvement. *Energy Efficiency* **17**, 32 (2024). https://doi.org/10.1007/s12053-024-10215-y

such as strict licensing requirements, connection rules and tariffs, can be incredibly discouraging to citizens and communities to start their own local energy projects[26]. The lack of awareness and knowledge about energy communities is also one issue to be addressed[27].

In order to foster energy communities and increase the focus on the integration of renewable energy, national legislation should be reviewed with regard to obstacles to the development of energy communities and the integration of renewable energy in building renovation projects. There is a need to showcase the good practices which managed the technical and financial obstacles for the integration of RES, in order to facilitate political will and build the trust of stakeholders to new solutions. National and local awareness-raising campaigns, using the most effective media, should ensure a sufficient level of awareness among residents and other stakeholders. Some good practices include the training of "energy ambassadors" to promote the idea in local communities. The capacity of local and regional authorities, renewable energy communities themselves and other relevant actors, such as citizen-led renovation initiatives, should be strengthened through guidance and training, which Member States should ensure according to Article 29 of the EPBD.

7.4. Respect the Partnership Principle and Increase the Participation

Resident participation is one of the key elements in designing effective strategies to address energy poverty. It facilitates the process of renovating MABs and the energy transition as a whole. Decisions on energy transition need to be inclusive, participatory, collaborative and deliberative to be considered democratically valid. These features are necessary in order to prevent the undermining of any policy action by public scepticism and lack of trust. A new framework for energy transition governance, motivated by an inclusive and reflective view of collective action, is needed to achieve the scale of action required for CEE countries.

Involvement becomes participative when stakeholders know that their contributions will be taken into account, and can see their impact in the future. Public awareness is crucial to stimulate the necessary public debate for and subsequent interest in participation. Therefore, the implementation of national and local awareness-raising campaigns is needed to stimulate public discussion and participation in the energy refurbishment of MABs, especially targeting vulnerable co-owners and neighbourhoods.

An additional aspect to consider is the capacity to participate. Vulnerable groups are often excluded, for example by being unable to come to meetings, by lacking access

[26] Climate Action Network Europe (2022) Communities for RES – Energy Communities in Central Eastern Europe. https://caneurope.org/cee-energy-communities/

[27] These are among topics of the Article 29 of the revised EPBD that highlight the importance of awareness raising, especially tailored to the vulnerable population groups.

to clear and understandable information, or by being reluctant to talk about their homes, energy behaviour and other potentially traumatising experiences.

The decision-making process regarding local, regional, and national action should also be participatory. The involvement of homeowner association representatives from MABs in the decision-making process is necessary for revealing the aspects that might not be addressed in a top-down approach of the policy design.

The recognition of the already existing energy transition structures should be transparent for citizens who are already participating in the energy transition. Existing and effective citizen-led initiatives can be supported or considered for the bigger scale. The answers are often to be found within their own communities, and citizens may already be participating in the energy system and contributing to the energy transition in a niche way.

One of the inspirations for the participation structures can be the Partnership principle of the Cohesion policy, one of the key principles of the management of European Union funds, which implies close cooperation between public authorities at national regional, and local levels in the Member States and with social partners, NGOs, and other relevant stakeholders. The European code of conduct on the partnership principle establishes a common set of standards to bring enhanced consultation, participation, and dialogue with partners for programme design and implementation. Feedback from stakeholders indicates that its implementation of partnership principles varies greatly across the EU[28]. Ensuring that the partnership principle is respected requires the participation structures to be in place that do not only tick the boxes but are effectively inclusive and representative.

[28] European Commission: Directorate-General for Employment, Social Affairs and Inclusion, *The European code of conduct on partnership in the framework of the European structural and investment funds*, Publications Office, 2014, https://data.europa.eu/doi/10.2767/49637

8. Conclusions

The CEESEN-BENDER project addresses critical barriers to energy-efficient building renovations and energy poverty alleviation in Central and Eastern Europe. Through a detailed analysis of regulatory frameworks, financial mechanisms, and technical challenges, the project has identified significant obstacles that hinder the achievement of energy transition goals in MABs and energy poverty action. These barriers are related to the targets, national measures, implementation, and monitoring for energy renovation and energy poverty alleviation in MABs as well as to public calls for energy renovation of MABs in CEE countries, as identified on the case of CEESEN-BENDER project partners countries.

The following barriers were identified:

- **Barriers related to targets for energy renovations and energy poverty alleviation in MABs**
  - Challenging historical context of the building stock
  - Unreliable building stock data
  - Lack of policy prioritisation
  - Insufficient financing to meet energy renovation targets

- **Barriers related to national measures for energy renovations and energy poverty alleviation in MABs**
  - Addressing energy poverty
  - Insufficient capacity of local and regional government
  - Financial obstacles to the implementation of measures

- **Barriers related to implementation and monitoring processes for energy renovations and energy poverty alleviation in MABs**
  - Inconsistent and insufficient reporting
  - Involvement of key social actors and citizen's initiatives
  - Inclusion principles in the support options design

- **Barriers related to public calls for energy renovations of MABs**
  - Complexity of administrative procedures and application eligibility criteria
  - Transparency in the application and approval process
  - Insufficient support for the vulnerable groups
  - Complexity for Renewable Energy Integration
  - Co-financing and availability of financial instruments

By highlighting these challenges in CEE countries, the following policy recommendations areas were identified in the policy briefs:

- **Policy recommendations**
  - Improvements related to the design of support programs for building renovation include allocation criteria, program monitoring, and transparency
  - Improved handling and access of the data related to building energy performance and energy poverty
  - Improved conditions for the integration of renewable energy systems into a building renovation project
  - Respect the partnership principle and increase participation

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