



Rural Energy Efficiency Roadmap (Single-family house)



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About RENOVERTY

RENOVERTY will foster energy efficiency building upgrades in the Central and Eastern Europe (CEE), South-eastern Europe (SEE) countries, as well as Southern European countries (SE), by setting the methodological and practical framework to build renovation roadmaps of vulnerable rural districts in a financially viable and socially just manner.

Specifically, the project aims to deliver tools and resources to support local and regional actors to build and execute operational single or multi-household roadmaps for rural areas. A scalable model will also be created to ensure the wide geographical replicability and implementation of the roadmaps by different actors at the EU level. Strategically, the project will contribute to minimising logistical, financial, administrative, and legal burdens caused by a complex and multi-stakeholder home renovation process. Additionally, RENOVERTY will ensure that building retrofits consider the social dimension by incorporating security, comfort, and improved accessibility in the roadmaps to further improve the quality of life of vulnerable populations.

Over the project's three years, seven pilots located in Sveta Nedelja (Croatia), Tartu (Estonia), Bükk-Mak & Somló-Marcalmente-Bakonyalja Leader (Hungary), Zasavje (Slovenia), Parma (Italy), Coimbra (Portugal), and Osona (Spain) will implement the roadmaps, while wider integration of rural and peri-urban development is foreseen in the long run.

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EXECUTIVE SUMMARY

This document represents **the roadmap for renovating households experiencing energy poverty, in rural areas (abbreviated REER)**, with a focus on single-family houses in the Zasavje region.

The overall aim of the REER is to promote energy renovations of households experiencing energy poverty. The REER is designed to be a helpful resource to key stakeholders, those being (i) households experiencing energy poverty; (ii) local actors that can help guide households in the process of renovation, particularly Centers for social work, humanitarian organizations, health care workers, and local action groups (LAGs); and (iii) national governmental bodies and local governments that develop and implement policies and measures aimed at alleviating energy poverty.

This REER specifically aims to:

- 1) **Provide essential information to Slovenian households about the process of energy renovation**, with an emphasis on available options for financing energy efficiency measures. This information is gathered and presented in Section 1 of the REER;
- 2) **Enable local actors that have direct access to households to better guide them in the process of renovation**, particularly in the early stages (contacting Eco fund coordinators, applying for funds, etc.). Information for local actors is included in Sections 1 and 2.
- 3) **Promote structural improvements to energy renovation processes** of households experiencing energy poverty by identifying barriers to energy renovations and proposing ways to address them that could be implemented by either national actors (ministries, Eco fund) or local governments. The identification and ways of overcoming these systemic barriers are presented in Section 2.

Section 1 of the REER is more technical in nature and draws on the findings of the energy audits that were performed in the pilot region of Zasavje as part of the RENOVERTY project. Section 1 of the REER thus functions as a guide to households for undertaking energy renovation, whereas **Section 2** addresses structural and community aspects of the renovation of households experiencing energy poverty in rural areas by focusing on identifying and overcoming legislative, financial, and administrative barriers.

This REER is a result of a process which included several workshops with a variety of local and national stakeholders such as municipalities, utilities, centers for social work, social organizations, energy and development agencies, local action groups (LAGs) and other actors, including households. It is important to highlight that events with households experiencing energy poverty were informed the creation of the REER, which helped to ensure that the roadmap answers their needs.

Energy poverty

The understanding of energy poverty in this REER stems from the general definition of energy poverty as set in the Commission Recommendation (EU) according to which energy poverty is a situation in which households are unable to access essential energy services¹. However, the REER also follows the more specified definition and criteria for energy poverty as set in the Slovenian Regulation on criteria for defining and assessing the number of energy poor households, which defines energy poverty as *"a situation in which a household with an income below the at-risk-of-poverty threshold is unable to meet its basic energy needs due to inadequate housing conditions or the inability to meet these needs at affordable prices or the low energy efficiency of its dwellings. Basic energy needs include, in particular the costs of heating, hot water, cooling, cooking and lighting."* Based on the criteria set in the Regulation, households experiencing energy poverty are also those that are **receiving state social financial assistance (e.g. social assistance, protection allowance)**. Since the national subsidy system for energy renovation is based on these criteria, the REER follows this narrower definition of energy poverty, which is tied to households that receive state social financial assistance.²

About the pilot region of the RENOVERTY project – Region of Zasavje

Slovenia is divided into 12 statistical regions. The Zasavje region is in central Slovenia, along the banks of the river Sava. It is the smallest region in Slovenia by surface area (485 km²) and second smallest by number of inhabitants (56.942). However, it is also the third most densely populated region in the country. It covers only four municipalities: Hrastnik, Litija, Trbovlje and Zagorje ob Savi. The average age of the regional population is 45 years. In the past, coal mining was the dominant industry in the region while the glass industry also has a long tradition in the region. The region has the lowest gross domestic product per capita in the country, - 46.1% lower than the national average. This region also has the highest level of serious material deprivation among its population as the living conditions of 4.5% of the population in the region is severely limited due to the limited financial resources of the household. However, 10.1% of the inhabitants live with incomes below the poverty risk threshold, which represented the fourth lowest level among all the regions in the country³.

¹ COMMISSION RECOMMENDATION (EU) 2020/1563 of 14 October 2020 on energy poverty: <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32020H1563>.

² PISRS 2025, Uredba o merilih za opredelitev in ocenjevanje števila energetske revnih gospodinjstev: <https://pisrs.si/pregledPredpisa?id=URED8648>.

³ Statistical Office of the Republic of Slovenia <https://www.stat.si/obcine/sl/Region/Index/5>.



Figure 1: Map of Slovenia by statistical regions, pilot region of Zasavje in red

Larger single or multi-family houses in which only 1 to 2 people live have problems with appropriate heating in winter due to high costs and energy inefficient buildings. Based on the available data of the Statistical Office of the Republic of Slovenia, an estimated 9.6% of all households in the Zasavje region are facing energy poverty, slightly above the national average (7.2%). The number of households experiencing energy poverty is 2000, which corresponds to 3000 individuals experiencing energy poverty in the region⁴. The most at-risk population for energy poverty in Slovenia are the elderly, particularly women. The highest share of households experiencing energy poverty is in single-person households, where the resident is above 65 years old (17%) and is female (17.3%)⁵.

In Zasavje, 43% of all inhabited buildings are single-family houses⁶. Half of all dwellings in Zasavje were built between 1961 and 1991. Only 7% of all dwellings in Zasavje were built in the last 20 years⁷. Central heating systems are the predominant mode of heating homes (58% of all homes)⁸. District heating covers 25% of all homes, above the national average of 13%⁹. The region, particularly the municipalities of Hrastnik and Trbovlje has one of the highest prices of district

⁴ Statistical Office of the Republic of Slovenia

<https://pxweb.stat.si/SiStatData/pxweb/sl/Data/Data/0886704S.px/table/tableViewLayout2/>

⁵ Statistical Office of the Republic of Slovenia (2024) Energy poverty by household type

<https://pxweb.stat.si/SiStatData/pxweb/sl/Data/-/0886702S.px/table/tableViewLayout2/>

⁶ The Statistical Office of the Republic of Slovenia: <https://pxweb.stat.si/SiStatData/pxweb/sl/Data/-/0861210S.px/table/tableViewLayout2/>

⁷ Statistical office of the republic of Slovenia (2024) Dwellings by occupancy status and period of construction for 2021

<https://pxweb.stat.si/SiStatData/pxweb/sl/Data/-/0861211S.px/table/tableViewLayout2/>

⁸ The Statistical Office of the Republic of Slovenia (2021): <https://pxweb.stat.si/SiStatData/pxweb/sl/Data/-/0861220S.px/table/tableViewLayout2/>.

⁹ Statistical Office of the Republic of Slovenia, 2023: Delež gospodinjstev (%) po glavnem načinu ogrevanja v stanovanju, kohezijski in statistične regije, Slovenija, večletno: <https://pxweb.stat.si/SiStatData/pxweb/sl/Data/-/0886603S.px/table/tableViewLayout2/>

heating in the country (above 210 €/MWh)¹⁰. In terms of heating fuel used by households, wood is the most used fuel on the national and regional level (Zasavje), roughly 30% of the households use wood for heating¹¹.

¹⁰ Agencija RS za energijo (2023) Cene toplote iz distribucijskih sistemov toplote v Sloveniji za mesec januar 2023: https://www.agen-rs.si/documents/10926/394458/Cene-toplote_202301/3ab1886f-0c6e-4f3d-b864-3dfc7db325dd.

¹¹ Statistical office of the republic of Slovenia (2024) Share of households (%) by main energy source used for heating the dwelling: <https://pxweb.stat.si/SiStatData/pxweb/sl/Data/-/0886608S.px/table/tableViewLayout2/>

1 SECTION 1: Technical considerations for the refurbishment of households experiencing energy poverty

1.1 Energy audit

An energy audit is usually the first step in the renovation process. It is a **systematic inspection and analysis of energy use and energy consumption of a building**¹². In simpler terms, an energy audit offers detailed information about the energy characteristics of the dwelling, its energy systems and energy sources, and provides a list of measures identifying methods for improving the overall energy efficiency of the audited dwelling. This type of information is crucial for planning energy renovation.

Based on the results of energy audits, **energy performance certificates (EPCs)** are issued for each dwelling. EPCs are important instruments that help improve the energy performance of buildings. Energy performance certificates are also aimed at providing information to consumers on buildings they plan to purchase or rent. Certificates must be included in all advertisements in the commercial media when a building is put up for sale or rent. They must also be shown to prospective tenants or buyers when a building is being constructed, sold, or rented. After a deal has been concluded, they are handed over to the buyer or new tenant. EPCs should also disclose cost-effective ways and, where appropriate, available financial instruments to improve the energy performance of the building to the owners or tenants of the buildings.

In Slovenia, an EPC must be obtained by the building's owners if the building (or apartment) is to be sold or leased for a new lease (longer than one year). Building owners who do not sell or rent out their properties do not need an energy certificate. An energy certificate must also be obtained for all new buildings. Energy certificates are produced by independent experts with a license. The current list of experts is available on the website of the [Ministry of Environment, Climate and Energy](#)¹³.

¹² "Energy Efficiency in Building Renovation," *Handb. Energy Effic. Build. A Life Cycle Approach*, pp. 675–810, Jan. 2019, doi: 10.1016/B978-0-12-812817-6.00042-5.

¹³ Portal energetika, Ministrstvo za okolje, podnebje in energijo: <https://www.energetika-portal.si/podrocja/energetika/energetske-izkaznice-stavb/za-drzavljane/> (dostop 24.7.2024).

An EPC includes an **energy performance rating** and **recommendations for cost-effective improvements**. The data on energy performance includes information on the 1) energy for heating (kWh/m²), 2) supplied energy for TSS (technical building systems) operation in buildings (kWh/m²), 3) total primary energy (kWh/m²), 4) CO₂ emissions (kg/m²) and 5) total energy use by energy source and energy products. The EPC also includes recommendations for cost-effective improvements to energy efficiency and accompanying data on the dimensions of the building, the surface area of the apartment, the year of construction etc.¹⁴

The **cost of obtaining an EPC** is dependent on the type and size of the household, the complexity of the heating, cooling and ventilation system, the documentation provided and the individual contractor, their proximity to the household etc. For a typical single-family house, prices vary between €300 and €400¹⁵. The cost of the EPC could be an initial obstacle to the energy renovation process of households experiencing energy poverty, if an existing EPC would be required to apply for subsidies.

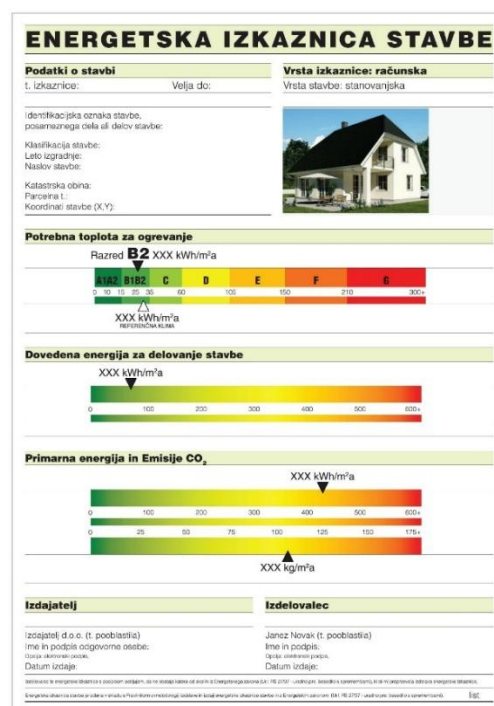


Figure 2: Template of an EPC (first page, data on energy performance)

Households and individuals experiencing energy poverty can apply for a subsidy for renovation measures that are 100% covered by the national fund Eco Fund (up to €18,000). Applicants for these funds must be co-owners of the dwelling. **The Eco Fund does not require applicants to provide an EPC for their building. A simplified energy audit is included as part of the Eco**

¹⁴ Portal energetika, Ministrstvo za okolje, podnebje in energijo: <https://www.energetika-portal.si/podrocja/energetika/energetske-izkaznice-stavb/za-drzavljanje/> (dostop 24.7.2024).

¹⁵ Moj mojster, Energetska izkaznica: cena in izdelava energetske izkaznice Dostopno na: https://www.mojmojster.net/clanek/74/Energetska_izkaznica_ali_jo_potrebujem (31.7.2024).

Fund subsidy scheme. When the applicant fulfils conditions of the public call, the Eco Fund's appointed energy consultant conducts a preliminary inspection of the building, which also includes a simple energy audit. This audit identifies areas where energy is being wasted, such as poor insulation, inefficient heating systems, or outdated appliances. Based on the audit, the next step is to prioritize renovations that will yield the highest energy savings.

Findings of energy audits in case of RENOVERTY

A total of 12 single-family, multiapartment and multi-family houses were audited in Zasavje, Slovenia to gain an understanding of the typical energy performance in this

sample of homes¹⁶. Although the sample size is small, the audits provide insight into the typical energy performance of buildings in the area. On average, three household members live in most of the audited buildings and predominantly occupy the space from 5 pm to 9 am. The year of construction of the audited houses ranges between 1905 and 1975, with the average year of construction being 1942. Most of the audited households have 1 basement level and 3 ground levels, with an average total floor area of 67.75 m².

Out of the 12 audited dwellings, three rely primarily on wood fuels (wood stove, wood oven, etc.), sometimes combined with electric heating (e.g. wood fireplace and electric radiator). Three households are connected to a district heating system (natural gas), two have a central heating system (natural gas boiler - 42 Kw), two rely on electric heating (4Kw) and two use a fuel oil boiler (40kW). Almost all audited households use LED bulbs with a capacity of 2-4W, while only one uses classical bulbs (25-60W).

Half of the audited dwellings in Slovenia have an energy efficiency class F or G (according to the required energy for heating), with an average heat required for primary energy heating of 160 kWh/(m²a). The average primary energy of the audited dwellings is 341 kWh/ m²a.

¹⁶ Due to difficulties in communicating and coordinating with one household, there were 11 energy audits done on-site based on which EPCs were created. For the 12th household only, a short visit was possible. Since the household was part of a multi-apartment building, the existing EPC of an apartment in the same building with the same characteristics was used.

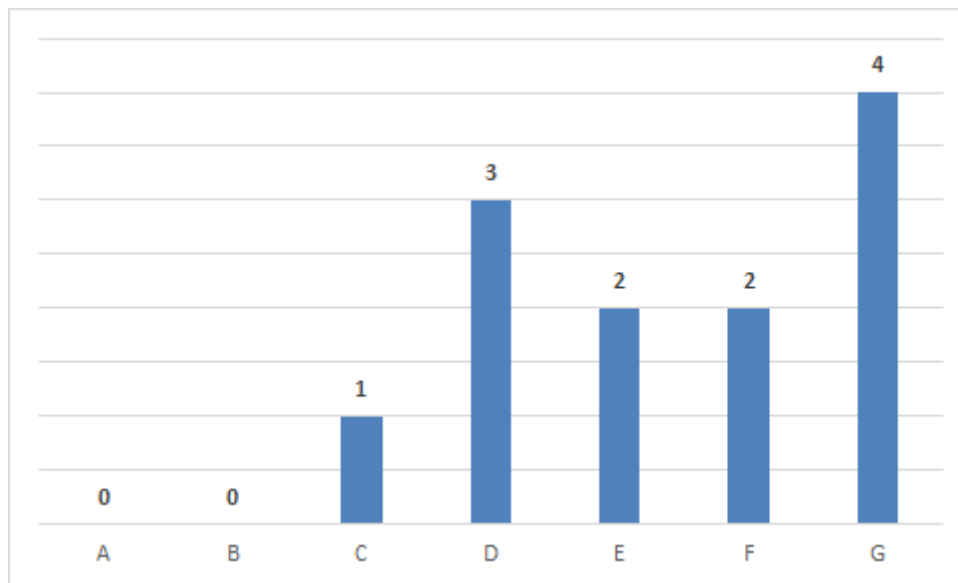


Figure 3: Distribution of energy efficiency classed for audited dwellings in pilot area Zasavje, Slovenia.

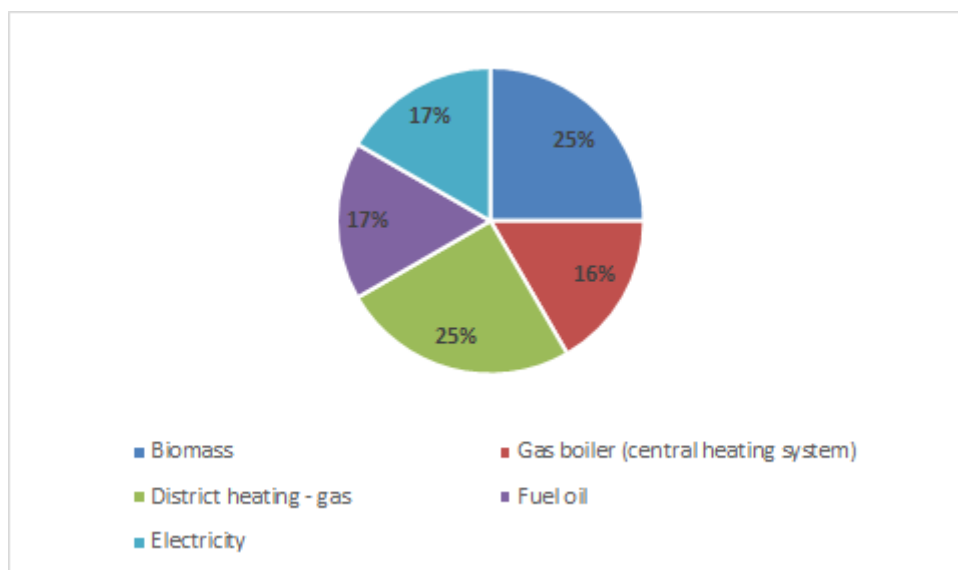


Figure 4: Distribution of heating systems for audited dwellings in pilot area Zasavje, Slovenia.

Out of the 12 households audited, 3 were single-family homes. The houses were constructed in 1905, 1928 and 1964. Two houses use **wood biomass** for heating purposes, and one uses **fuel oil**. They are placed within the **G**, **E** and **D** energy classes with the average primary energy of the audited dwellings of 346.3 kWh/ m²a.

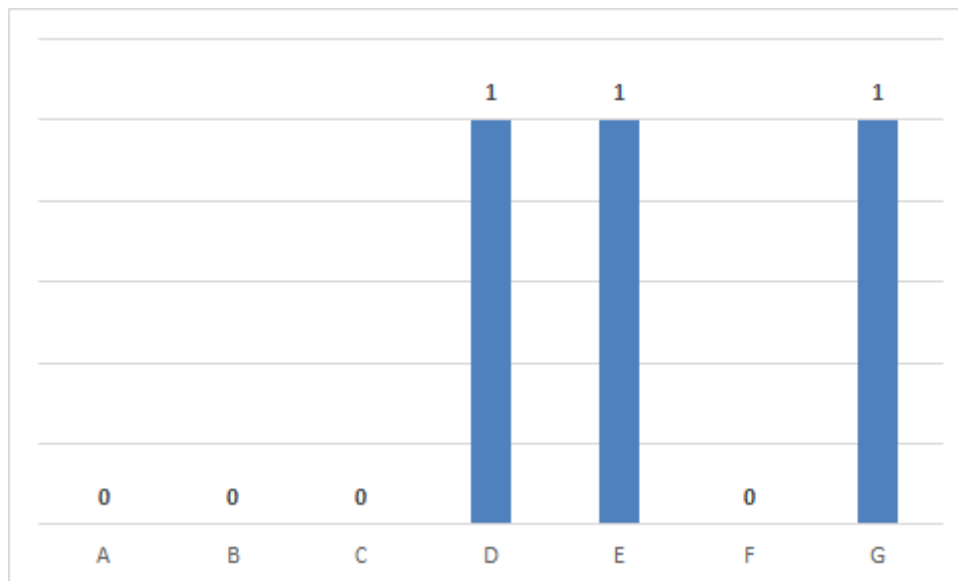


Figure 5: Distribution of energy efficiency classed for audited single-house buildings in pilot area Zasavje, Slovenia.

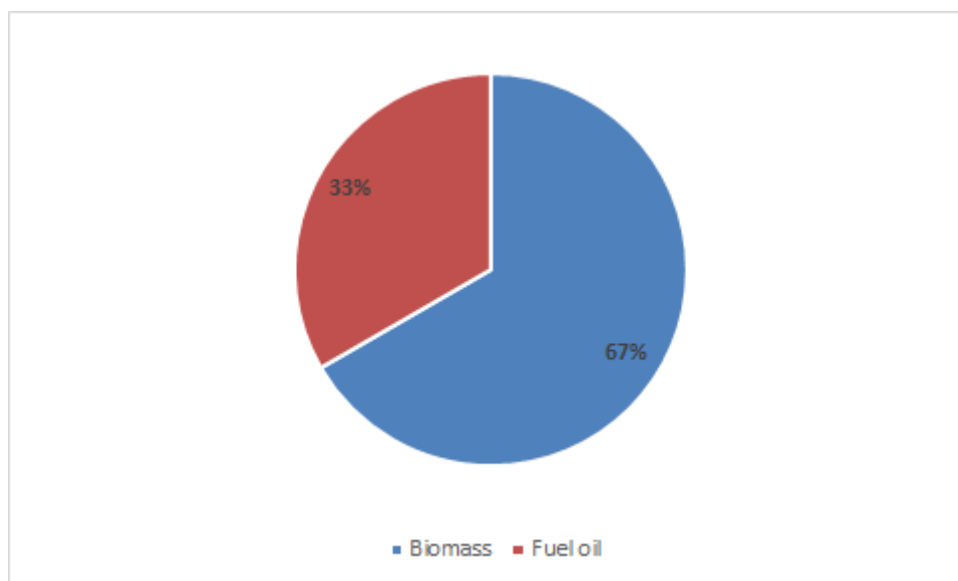


Figure 6: Distribution of heating systems for audited single-house buildings in pilot area Zasavje, Slovenia.

1.2 Setting renovation expectations and indicators for rural households

The renovation of households inhabited by those experiencing energy poverty can improve the living conditions, reduce the energy costs, and enhance the overall well-being of these citizens. The primary objective of implementing renovations is to increase a household's energy efficiency by upgrading insulation, windows, heating systems, and appliances. This reduces energy

consumption, lowering utility bills for families struggling with high energy costs, and decreasing their vulnerability to price fluctuations.

Another key objective is to ensure that homes meet modern health and safety standards. Poorly insulated and inefficient homes often lead to dampness, mould, and inadequate heating, which can cause or exacerbate respiratory issues and other health problems. Renovation efforts, therefore, focus on creating healthier indoor environments.

Additionally, these renovations contribute to broader environmental goals by reducing greenhouse gas emissions. By cutting energy waste, households lessen their carbon footprint, aligning with global efforts to combat climate change.

Finally, addressing energy poverty through renovation supports social equity. Energy-efficient homes enhance the quality of life for low-income families, reducing the disparity between different socioeconomic groups. The renovation of homes experiencing energy poverty not only provides immediate financial relief but also promotes long-term sustainability, health, and social inclusion.

The main goals of energy renovation and related indicators can be divided into four categories:

Goal	Indicator	Indicator value (informative estimate ¹⁷)
Improved energy efficiency of the building	<ul style="list-style-type: none"> - Improvement of energy rating - Reduction of energy use for heating 	<ul style="list-style-type: none"> - Energy class A-D - up to 105 kWh/m²¹⁸
Reduced energy costs for the household	<ul style="list-style-type: none"> - Reduced monthly utility bills for heating and electricity 	<ul style="list-style-type: none"> - Perceived affordability to meet energy needs (e.g. scale responses to “Is it more affordable to keep your home adequately warm during the winter/cool during the

¹⁷ These are rough estimates by the authors of REER and are only of informative nature.

¹⁸ Based on standards for energy classes used in ECPs. 105 kWh/m² is the upper limit for energy class D.

		summer" after the renovation?) ¹⁹
Improved quality of living (thermal comfort, indoor air quality)	<ul style="list-style-type: none"> - Increase in indoor temperature in winter/ decrease in indoor temperature in summer - Lowered levels of humidity - Elimination of mold 	<ul style="list-style-type: none"> - min. 19 – 21 °C in winter months - max. 28 °C in summer months - 40-60% humidity level - no mould
Reduced climate footprint related to energy use	<ul style="list-style-type: none"> - Reduced CO₂ emissions 	<ul style="list-style-type: none"> - up to approx. 100 kg/m²a²⁰

1.3 Planning the renovation

Planning the energy renovation of a household inhabited by citizens experiencing energy poverty involves several crucial steps aimed at maximizing energy efficiency, reducing costs, and improving comfort. As already mentioned above, an **energy audit** is the first step, which helps to **specify the (priority) renovation measures**. These typically include upgrading insulation, replacing windows and doors, and installing energy-efficient heating, and ventilation. The integration of renewable energy sources, such as solar panels, may also be considered to further reduce energy reliance on non-renewable sources. **Budgeting** is a critical part of the planning process. Detailed cost estimates should be prepared, considering both immediate expenses and long-term savings. A **timeline** is then developed, coordinating the availability of contractors and materials while minimizing disruption to daily life. Proper planning ensures that the energy renovation is cost-effective, efficient, and tailored to the specific needs of the household.

When starting to plan for energy renovation it is important to keep in mind that every individual in Slovenia can sign up for free energy consult at a selected **local office within the ENSVET network**, which offers individual and independent energy advice and information. These advisors can help households in planning their first renovation steps, including financial resources available.

¹⁹ Quantitative indicator values such as x % decrease in costs or x % of income spent on energy needs are problematic since they do not necessarily demonstrate the affordability of meeting the energy needs of the household.

²⁰ The indicator value is based on the value scales used in ECPs ([here](#)).

1.3.1 Planning the renovation – energy audit

A simplified energy audit is included as part of the **Eco Fund subsidy scheme** for households experiencing energy poverty (eligibility tied to co-ownership of the dwelling). When the applicant fulfils the conditions of the public call, the Eco Fund's appointed energy consultant conducts a preliminary inspection of the building, which also includes a simple energy audit. This audit identifies areas where energy is being wasted, such as poor insulation, inefficient heating systems, or outdated appliances.

1.3.2 Planning the renovation – measures

A household can undergo a deep renovation or a phased renovation. **Deep renovation** involves the complete renovation of a building, significantly improving its energy efficiency, often to achieve near-zero net energy consumption. This type of renovation typically addresses various aspects of the building, including insulation, windows, and heating, cooling, and ventilation systems. The goal is to achieve significant reductions in energy consumption and greenhouse gas emissions. Deep renovations often require more extensive work than phased renovations. **Phased renovation** is a gradual and staged approach to building renovation. Instead of carrying out the entire renovation in one step, this method divides the process into individual, more manageable, and gradually achievable steps. In this approach, improvements are identified and implemented in several steps, allowing different areas of the building to be focused on at different times. This allows for better management of available resources, both financial and time, and allows for the effectiveness of the changes made to be assessed before the renovation continues. Particularly due to the financial burden and difficulties with financing deep renovation, the **gradual approach to renovation, where we (based on the energy audit) identify and prioritize key energy efficiency measures** that need immediate attention, is the most relevant for households experiencing energy poverty.

The two energy renovation measures that stand out as the most frequently proposed measures based on conducted energy audits across all dwelling types are: **insulation of the ceiling** and **mechanical ventilation with heat recovery**. A detailed overview of the proposed measures by the conducted energy audits is presented in chapter 2.5. (Annex to section 1).

We also employed the DREEM model (Dynamic high-Resolution demand-side Management) for single-family house and multiapartment building typology to determine the most suitable energy efficiency measures in each pilot case study within the project. Based on the DREEM model it was established that for single-family houses in Zasavje installing a **heat pump and roof insulation** were identified as the most cost-effective measures in terms of annual energy savings and levelized cost of saved energy. A detailed overview of the proposed measures by the DREEM model is presented in chapter 2.5. (Annex to section 1).

In the case of Slovenia, there is a well-functioning scheme of funding specifically for energy renovations of households experiencing energy poverty by the national Eco fund. The following renovation measures are subsidized for single-family homes:

- thermal insulation of the roof or ceiling against the unheated space,
- thermal insulation of external walls,
- thermal insulation of the ground or floor above the unheated space/basement, and/or external walls of the heated spaces towards the ground,
- installation of energy-efficient windows and/or external entrance doors,
- the installation of a hot water system,
- the installation of local ventilation with waste heat recovery,
- replacement of an old combustion appliance with a new wood-burning biomass appliance.

1.3.3 Planning the renovation - budget

The Eco Fund, national fund for subsidizing energy renovation measures, offers subsidies of €18.000 for energy renovations of households experiencing energy poverty. The budget for renovation differs based on the type and size of the household and the measures to be implemented. There are no national registries of average costs for energy renovation measures. Households and individuals planning to undergo energy renovation can find useful information on the community platform MojMoster.net which connects contractors with clients. Below are the cost estimates for specific renovation measures that are featured on the platform:

MEASURE	COST ESTIMATION (When not specified, costs are not specific to a building typology)	REFERENCE
Insulation of the attic	€/m ²	https://www.mojmojster.net/cene/izolacija_mansarde
Insulation of external walls (16 cm of styrofoam)	€/m ² 40.8-45.6/m ²	https://www.mojmojster.net/cene/fasade_fasaders tvo
Mechanical ventilation with recuperation (450 m ³ /h, house)	€ 4800-8500	https://www.mojmojster.net/cene/prezracevanje

Heat pump with installation (8 kW, air-water)	€6000-12000	https://www.mojmojster.net/cene/toplotne_crpalk_e
Window installation (excl. material)	€/window 60-150	https://www.mojmojster.net/cene/montaza_vrat_in_oken
Solar power plant (incl. Installation)	€/kW180-300 (Based on recent experience with community solar projects, we estimate the costs at €/kW105)	https://www.mojmojster.net/cene/fotovoltaični_sistemi
Solar collectors for heating water	€ 3000-5000 (single family house of 200m ²) € 120-240 (15 tube solar collector, without installation)	https://www.mojmojster.net/cene/sončni_kolektorji

1.3.4 Planning the renovation – timeline of the Eco fund renovation process (ZER 2024)

The Eco Fund manages an efficient funding scheme for energy renovation measures of households experiencing energy poverty, including measures in single-family houses and measures in individual dwellings in multiapartment buildings. For households undergoing energy renovation under the **Eco Fund public call ZER 2024** for households experiencing energy poverty, the following steps need to be carried out:

1. The household submits the application to Eco fund (with the help of a coordinator, if needed);
2. The Eco Fund verifies that the applicant fulfils the conditions set out in the call for proposals and households receive official confirmation from Eco Fund;
3. If the applicant fulfils the specified conditions, the Eco Fund sends an energy advisor to the applicant's address to visit the building with the following purpose:
 - an energy audit of the building,
 - assess whether the applicant's household lives in low energy efficient premises or inadequate living conditions,
 - assessing whether the building is suitable for the implementation of the measures and whether the implementation of the measure is in line with the purpose and objectives of the call

- prioritising the eligible measures according to the condition of the building or part of the building.
- 4. The Eco Fund issues a Preliminary Building Inspection Report, which lists in order the most appropriate measures for the energy renovation of the building;
- 5. The Eco Fund issues a Decision granting an incentive of up to EUR €18.000 incl. VAT for the implementation of the measure or combination of measures. The applicant is then invited to submit, within 120 days of receiving the Decision, a proforma invoice from the selected contractor for the first measure listed in the Decision;
- 6. The household collects the proforma invoice(s) from contractors and submit it/them to Eco fund;
- 7. The applicant signs a contract with the Eco Fund and the contractor for the implementation of the measures. The deadline for the completion of the measure is 12 months from the signature of the contract;
- 8. The renovation works are carried out;
- 9. The energy consultant carries out interim and final verification of the implementation of the measure;
- 10. The Eco Fund pays the invoice to the contractor;
- 11. In case of remaining funds after the conclusion of the contract for measure 1, the applicant shall submit the pre-budgets for each subsequent measure within 120 days from the submission of the complete final documentation of the previously implemented measure. The follow-up procedure shall be repeated.



Figure 7: The Eco Fund process (from application submission to Eco fund ´s transfer of funds to the contractor), in Slovene

1.4 Barriers and challenges faced by households experiencing energy poverty

1.4.1 Financing the renovation

The main funding mechanism providing subsidies and soft loans for energy efficiency and the use of renewable energy in residential buildings is the **national Eco fund**. Soft loans and grants are allocated based on public calls for the allocation of funds. To receive the incentive, households must respond to the public call within the time of its duration by submitting an application, if the household meets the eligibility criteria required by the public call. Until the public call is closed, all the applicants proving eligibility are entitled to the Eco Fund's incentive. They aim to keep the public calls open the entire year because this is the least disturbing for the market.

The Eco fund allocates funds specifically for energy efficiency measures for households experiencing energy poverty. The main call through which the Eco fund subsidizes measures in single-family houses (and duplexes) experiencing energy poverty is the [public call ZER 2024](#). The subsidy covers **100% of investment costs up to €18,000** (in case of unexpected additional works this subsidy can be extended to €19,800). To be eligible for the subsidy, the applicant needs to have minimum 50% (co)ownership) of the house, is socially/economically disadvantaged (an applicant or a family member is a recipient of social benefits²¹), and lives in an energy inefficient building or inadequate living conditions. The building is considered energy inefficient if the heat required for heating is more than 150 kWh/m² per year. If the building does not have an EPC, its energy efficiency is established by the simplified energy audit that is included in the subsidy scheme. The building must be legal, residential in purpose and suitable for renovation. This subsidy scheme does not require the household to finance the measures upfront. The costs are initially covered by the contractor, who the Eco fund repays after the work is finished.

The subsidy covers one or multiple measures:

- 1) thermal insulation of the roof or ceiling against the unheated space in one or two apartment buildings,
- 2) thermal insulation of the external walls of a one- or two-apartment building,

²¹ To be considered a socially vulnerable household the applicant or a family member is entitled to 1) "denarna socialna pomoč", 2) "varsteni dodatek", 3) has twice in the last 2 years received "izredna socialna pomoč", 4) entitled to child allowance ("otroški dodatek") with the family belonging to the 3rd income class or 5) entitled to a state scholarship with the family belonging to the 2nd income class.

- 3) thermal insulation of the floor or the floor above the unheated room/basement and/or external walls of heated rooms facing the ground in one or two-apartment buildings,
- 4) installation of energy-efficient windows and/or exterior entrance doors in one or two-family dwellings, buildings or in an individual apartment in a multi-apartment building,
- 5) installation of a system for the preparation of hot and sanitary water in a one- or two-apartment building or into an individual apartment in a multi-apartment building,
- 6) installation of local ventilation by returning the heat of waste air to one or two-apartment buildings or in an individual apartment in a multi-apartment building,
- 7) replacement of an old heating device with a new one based on wood biomass in a one- or two-apartment building or in an individual apartment in a multi-apartment building.

Although the provided funds can cover a combination of energy efficiency measures, this subsidy would not cover all the costs of a deep renovation and **DOES NOT FUND** measures such as **heat pump installation** or **solar power plant installation**. The current subsidy scheme ([114SUB-OB24](#)) for solar power plant installation covers up to 30% of investment costs with a cap of €600 per 1 kVA installed capacity. Subsidies for heat pump installation range from 20 – 40% of investment costs with a cap at €1000 – 6000 depending on the type of heat pump and previous heating system.

An additional financial risk is the need for additional repairs or works, once the renovation has started, which can lead to unexpected additional costs. This risk is at the moment mitigated by the additional €1800 provided to the subsidy in such scenarios.

1.4.2 Complexity of the application process for Eco Fund subsidies

The application process for the for Eco fund subsidy under the public call ZER 2024 can present a challenge to households experiencing energy poverty. The application form and accompanying forms to be submitted (e.g. statements on the legality of the building) can be found on the Eco Fund [website](#). This requires households to already be informed of the subsidy and a level of digital skills to access the application form(s). As part of the subsidy scheme, the Eco fund provides a coordinator for households, which guides people through the application process free of charge. The list of coordinators (by region) who can also help fill out the application form can be found on the Eco Fund [website](#). Below is the list of coordinators for the Zasavje region (the list can change in the future).

Ana Kolar	Podjetniški projektni center ANAplus d.o.o.	040 642 239	ana@anaplus.eu
Diana Ščurek	Podjetniški projektni center ANAplus d.o.o.	040 200 358	diana.scurek@anaplus.eu
Nino Grah Won	Podjetniški projektni center ANAplus d.o.o.	040 834 200	nino.grah@anaplus.eu
Ali Ulaga	Podjetniški projektni center ANAplus d.o.o.	041 633 614	pisarna@anaplus.eu
Darja Godler	KIP Vizija d.o.o.	041 696 782	darja.godler@kipvizija.si
Simon Bon	Združenje za osebno asistenco Slovenije	070 132 771	pisarna@osebna-asistenca.si
Primož Jeralič	Nacionalni svet invalidskih organizacij Slovenije	01 330 72 16	primoz.jeralic@nsios.si
Mojca Vaupotič	Nacionalni svet invalidskih organizacij Slovenije	01 330 72 16	mojca.vaupotic@nsios.si
Dominik Pongračič	Cenitve in svetovanja, Dominik Pongračič s.p.	031 250 150	dominik.pongracic@gmail.com
Damjan Žveplan	Škofijska Karitas Celje	051 658 200	damjan.zveplan@karitasce.si
Oksana Magur	Škofijska Karitas Celje	071 466 441	prostovoljstvo@karitasce.si
Ana Pirnat	Škofijska Karitas Celje	040 579 599	poplave@karitasce.si

1.4.3 Availability of contractors

Undertaking energy renovation measures, particularly the timeline of the renovation process, is heavily reliant on available contractors who carry out the renovation works. The usual profile of companies involved in energy renovation are companies providing²²:

1. thermal insulation services (exterior walls, roof, floor...),
2. installation of windows and doors,
3. installation of mechanical ventilation systems,
4. replacement/installation of biomass heating systems,
5. replacement/installation of gas boilers,
6. installation of heat pumps,
7. installation of self-sufficient solar-power plants.

The process of searching for, choosing and communicating with contractors can be a demanding process accompanied by a lack of trust in contractors (more on this in Section 2 - Technical Barriers). There are some resources available that can help with the process of choosing a contractor:

²² The procurement of materials should be included in the services.

- List of [contractors by the Eco fund](#). The list is informative. Eco fund places on the list of contractors every contractor who has completed the application form for entry into the list and has a registered activity for the implementation of measures according to the public call ZER. Eco fund does not check the liquidity and references of contractors before including them on the list;
- List of contractors for [renewables investments by Borzen](#). The list is informative. Borzen does not guarantee for the listed contractors and does not assume any responsibility for any business cooperation that would be established when using information from this list;
- Web platform [Moj mojster](#) that connects clients with potential contractors across a wide range of businesses (architecture, construction, carpentry, facade works, windows installation etc.)

In case different measures are undertaken in the renovation process, different companies would also need to be contracted. E.g. contractors installing windows usually do not install mechanical ventilation systems. There is also a risk in contracting smaller-scale companies, since they might have difficulties covering all the costs of the renovation up front. Checking the availability of the best suited contractors in the region is thus an important step in the renovation process.

1.4.4 Disturbances in living spaces

The need for relocation during the renovation process can represent a barrier for a household to undergo renovation. However, this has not been identified as a challenge in the region, as perceived by the households. A collection of energy efficiency measures funded by the Eco fund subsidies (window replacement, external wall insulation etc.) have not been associated with demanding relocation, as households can live in their dwelling during the renovation.

1.5 Annex to section 1: Proposed measures based on audits and DREEM model (in detail)

Overall, the two energy renovation measures that stand out as most frequently proposed measures based on conducted energy audits are: **insulation of the ceiling** and **mechanical ventilation with heat recovery**. Below you can find the summary for all audited households.

	Single-family houses
	Multi-family buildings
	Colonies
	Rental situations

Household	Number in table
EPC nb. 2024-808-65-112024	1
EPC nb. 2023-808-65-108679	2
EPC nb. 2023-808-65-110135	3
EPC nb. 2023-808-65-106792	4
EPC nb. 2023-808-65-108655	5
EPC nb. 2024-808-65-112002	6
EPC nb. 2023-808-65-110136	7
EPC nb. 2023-808-65-110138	8
EPC nb. 2023-808-65-110140	9
EPC nb. 2017-461-21-53725	10
EPC nb. 2023-808-65-110132	11
EPC nb. 2023-808-65-110137	12

	1	2	3	4	5	6	7	8	9	10	11	12
Insulation of the ceiling above the basement	X		X									X
Insulation of the ceiling towards the attic	X	X	X	X	X	X		X			X	
Insulation of external walls	X						X	X	X		X	
Mechanical ventilation with heat recovery	X	X	X	X	X	X	X	X	X		X	
Biomass heating	X	X	X								X	
Replacement of the fuel oil boiler with a more suitable one		X										
Installation of thermostatic radiator valves		X										
Installation of the system of solar energy collectors for hot		X										

water preparation												
Replacement of windows			X									
Installation of photovoltaic panels			X			X						
Elimination of convection thermal bridges and improvement of air tightness				X			X					
Elimination of transmission thermal bridges							X		X			
Replacing lamps with more efficient ones and optimizing the provision of daylight								X				
Installation of a condensation gas boiler										X		

Proposed measure by the energy audits – single family houses

Most of the priority measures proposed in the energy audits of single-family houses center on **insulation measures, particularly insulation of ceilings**, and installation of **mechanical ventilation** with energy recovery.

Measure	1	2	3
Insulation of the ceiling above the basement	X		X
Insulation of the ceiling towards the attic	X	X	X
Insulation of external walls	X		
Mechanical ventilation with heat recovery	X	X	X
Biomass heating	X	X	X
Replacement of the fuel oil boiler with a more suitable one		X	

Installation of thermostatic radiator valves		X	
Installation of the system of solar energy collectors for hot water preparation		X	
Replacement of windows			X
Installation of photovoltaic panels			X

Household	Proposed measure
#1 EPC nb. 2024-808-65-112024	<ul style="list-style-type: none"> • Insulation of the ceiling above the basement • Insulation of the ceiling towards the attic • Insulation of external walls • Mechanical ventilation with heat recovery • Biomass heating
#2 EPC nb. 2023-808-65-108679	<ul style="list-style-type: none"> • Insulation of the roof - ceiling in the attic • Mechanical ventilation with heat recovery • Replacement of the fuel oil boiler with a more suitable one • Installation of thermostatic radiator valves • Biomass heating • Installation of the system of solar energy collectors for hot water preparation
#3 EPC nb. 2023-808-65-110135	<ul style="list-style-type: none"> • Insulation of the ceiling above the basement • Insulation of the ceiling to the attic • Replacement of windows • Mechanical ventilation with heat recovery • Installation of biomass central heating • Installation of photovoltaic panels

Proposed measures by the DREEM model – single family houses

We also employed the [Dynamic high-Resolution dE-mand-side Management \(DREEM\) model](#), to apply an evaluation framework that determined the most suitable Energy Efficiency Measures in the area of study. The modelling was done for single- and multi-family house typologies. Considering the specificities of the rural housing stock, the following energy efficiency measures (EEM) were evaluated for the RENOVERTY pilot regions:

- *EEM₁ - Exterior walls insulation*: Insulating the main walls of the building under study from the outside, which commonly have solid walls with no cavities.

- *EEM₂ - Double-glazed windows*: Replacing single-glazing windows with energy-efficient glazing (*Double-glazed windows*) to reduce heat loss.
- *EEM₃ - Roof insulation*: Insulated between and under the rafters of the roof itself, reducing the overall heat transfer coefficient by adding materials with low thermal conductivity (this measure applies only in the case of SFH).
- *EEM₄ - Energy-efficient heating system (Boiler upgrade - gas)*: In this case, the dwelling's outdated heating system is replaced by an efficient gas boiler with a higher efficiency ratio.
- *EEM₅ - Energy-efficient heating system (Boiler upgrade - biomass)*: In this case, the dwelling's outdated heating system is replaced by an efficient biomass boiler with a higher efficiency ratio.
- *EEM₆ - Energy-efficient heating system (Heat pump)*: In this case, the dwelling's outdated heating system is replaced by a heat pump with a higher efficiency ratio.
- *EEM₇ - Energy-efficient lighting*: In this case, the conventional tube lights and bulbs (fluorescent lamps) are replaced by high energy-efficiency ones (LED lamps).

In the baseline scenario, modelling results indicate that the SFH typology equipped with a wood stove in the rural region of Zasavje in Slovenia consumes around 27,053.8 kWh annually (almost 301.7 kWh/m²), which is divided into 23,603.5 kWh for its heating needs and 3,450.3 kWh for its cooling and appliances needs.

Replacing the dwelling's heating system with a **heat pump** (EEM₆) and **roof insulation** (EEM₃) were identified as the measures that lead to the *highest amount of energy savings* (67.5% and 45.2% reduction compared to the baseline scenario).

According to the analysis, EEM₃ (roof insulation) and EEM₄ (Boiler upgrade - gas) demonstrate the best performance in terms of NPV (net present value). However, installing a **heat pump (EEM₆) and roof insulation (EEM₃)** were identified as the **most cost-effective measures** in terms of annual energy savings and levelized cost of saved energy. Overall, EEM₂ (double glazed windows) and EEM₅ (biomass boiler) are the ones ranked lower in terms of cost-effectiveness, mainly because of the high investment cost of this intervention, indicating the need for incentives and initiatives aiming to increase their cost-effectiveness and lower their investment costs. Subsidies of at least 50% ensure positive net present values for EEM₁ (exterior walls insulation) and EEM₅ (boiler upgrade – biomass), while EEM₂ (double glazed windows) needs subsidisation of at least 75%. The model also investigates the correlation between NPV and cost-effectiveness of the different EEMs under study and indicates that EEM₃ (Roof insulation), EEM₄ (Boiler upgrade - gas) and EEM₆ (Heat pump) rank highest, representing more attractive investments.

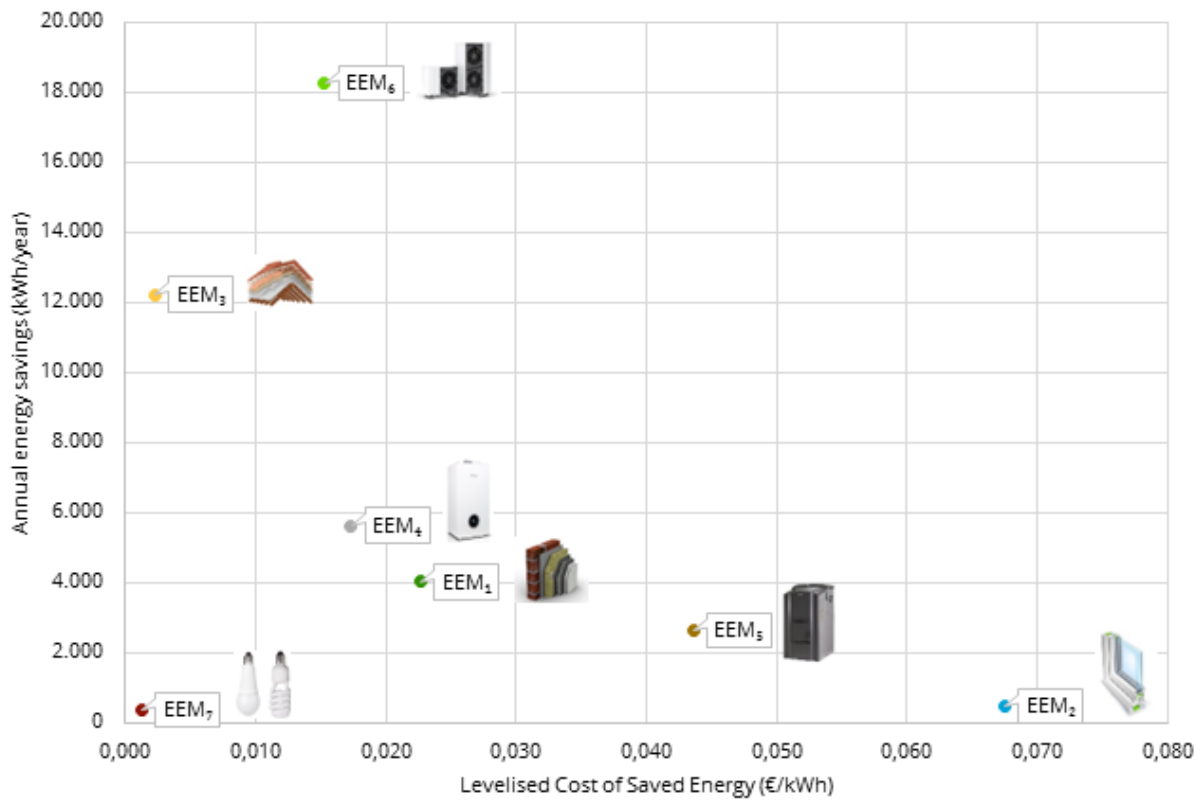


Figure 8: Energy-saving potential and cost-effectiveness of the EEMs under study in the case of the SFH typology (gas boiler) in the rural region of Zasavje in Slovenia.

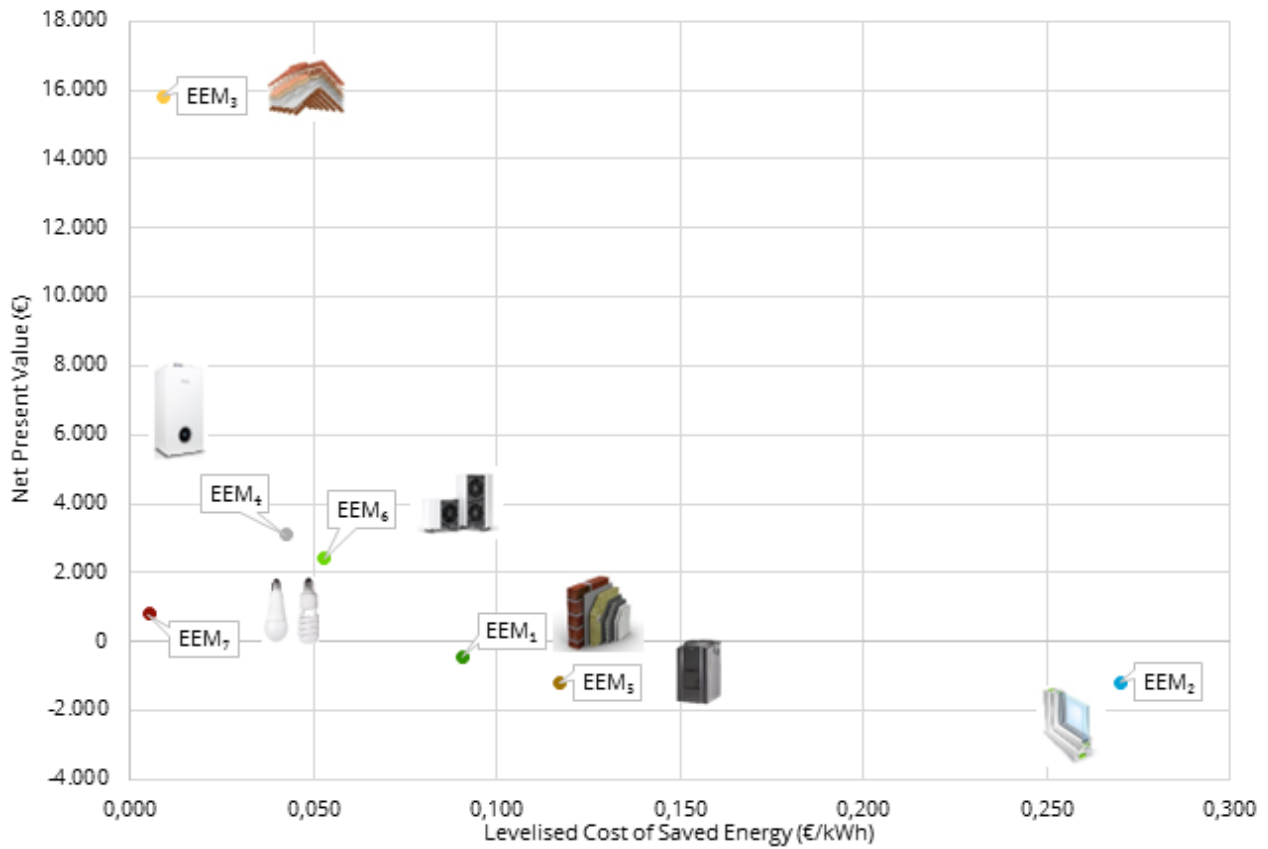


Figure 9: Profitability and cost-effectiveness of the EEMs under study in the case of the SFH typology in the rural region of Zasavje in Slovenia.

2 SECTION 2: What's next? Conceptualizing and applying actions to reduce energy poverty in rural areas

2.1 Identifying and overcoming structural barriers and challenges

There are numerous structural challenges and barriers in the renovation process of households experiencing energy poverty in rural areas. This section provides an overview of the detected challenges and barriers that should be addressed by relevant national, regional and local actors. The barriers are organized into groups (technical, financial, administrative, legal, and community). The section also provides an overview of possible ways to tackle and overcome the outlined barriers and challenges.

2.1.1 Technical barriers and challenges

BARRIERS AND CHALLENGES	MEASURES FOR OVERCOMING BARRIERS AND CHALLENGES
<p>DISTURBANCES IN LIVING SPACES</p> <p>Need for relocation during the renovation process.</p>	<p>This can be a potential barrier to the renovation process, but it has not been identified as a challenge in the region, as perceived by the households.</p> <p>Additionally, measures that are funded by the Eco fund are not of such nature (not deep renovation) that they would demand a relocation as households can live in their dwelling during the renovation.</p> <p>In the future, it may become a bigger obstacle due to the increasing necessity of static renovations.</p>
<p>UNAVAILABILITY OF CONTRACTORS</p>	

<p>At certain periods of the year, contractors can be unavailable due to high levels of demand and a lack of skilled workforce.</p>	<p>To avoid this obstacle, renovations should be scheduled during off-seasons whenever possible.</p> <p>For the Eco Fund ZER 2024 subsidy, the guidelines allow a 9-month period between signing the contract (household, Eco Fund, contractors) and completing the work, giving households some flexibility in setting the renovation timeline. If experiences of the Eco Fund programs show that the tight timeline is an issue, the Eco Fund could consider adjusting it.</p> <p>Households should ensure timely planning of the renovation, taking contractor availability into account and maintaining regular communication with them.</p> <p>As this challenge is common to all renovations (also renovations in households not experiencing energy poverty), the government should consider developing policies and measures that would enable a better development of the renovation sector in the country (e.g. ensuring proper education programs, rethink the salary policies of the sector...).</p>
<p>UNAVAILABILITY OF CONTRACTORS</p> <p>For the Eco Fund subsidies aimed at alleviating energy poverty (ZER 2024), contractors cover the costs of the renovation measures upfront and are later reimbursed by the Eco fund. This system may limit contracting to larger companies, as smaller businesses might not have the resources to cover the costs upfront.</p>	<p>The first step in addressing this potential challenge is to provide a comprehensive overview of energy renovation-related contractors in the region (by size and liquidity).</p> <p>This overview could best be done by local or regional actors (municipalities or the development agency of Zasavje). The informative list could be made available on municipal websites, and the Eco Fund could</p>

	<p>also refer to it on its own website and communication channels.</p> <p>Alternatively, in the long run, the Eco Fund could reconsider its reimbursement rules, to allow for greater participation by smaller contractors.</p>
<p>UNAVAILABILITY OF CONTRACTORS</p> <p>Contractors across Slovenia are territorially distributed, they mostly carry out work in the region or around its headquarters. In rural areas and smaller regions like Zasavje, the number of suitable contractors might be lower and contractors from other regions might be involved in the renovation. The geographical distance between the location of the contractor and the home under renovation can pose challenges in the renovation process (delays, higher upfront costs due to transport...).</p>	<p>Group purchase or order of renovation works could help to tackle this obstacle. The group purchase could be organized at the municipal level with the municipality acting as the organiser of the group purchase or, alternatively, support of the Consumer Protection Association of Slovenia can be sought. The association has implemented several successful cases of group purchase. In this respect also the stimulation of energy communities, specialised in the renovation, would be beneficial.</p>

2.1.2 Financial barriers and challenges

BARRIERS AND CHALLENGES	MEASURES FOR OVERCOMING BARRIERS AND CHALLENGES
<p>ENERGY EFFICIENCY MEASURES NOT SUBSIDIZED (FULLY) BY THE ECO FUND</p> <p>The subsidy schemes provided by the Eco fund for energy renovations of households experiencing energy poverty are a good mechanism and should be maintained. However, certain shortcomings could be addressed:</p> <ol style="list-style-type: none"> 1. The individual subsidy amount aimed at alleviating energy poverty by the Eco fund (up to €18000) does not cover deep renovation. 2. Installation of heat pumps is not included in the Eco fund's subsidies that address energy poverty and cover 100% of the investment. 3. There are no subsidies for people experiencing energy poverty, to install renewables, more specifically PV. 	<ol style="list-style-type: none"> 1. Improvements, made possible by the Eco fund, already make a significant contribution to eliminating energy poverty. Deep renovation is thus usually not needed. 2. It could be considered that the future programs of the Eco Fund for alleviating energy poverty would work towards deep renovation by increasing the available funds for renovation. 3. When it comes to households experiencing energy poverty other measures (e.g. insulation) usually have priority. Additionally, the main reason given by the Eco Fund and some energy experts for heat pumps not being included in the subsidy scheme is the high(er) costs of electricity for the household following the implementation of this measure. The running costs of electricity, needed to use the heat pumps, are too high for families experiencing energy poverty to sustain. A possible solution would be to at the same time install PV, which would significantly reduce the costs of electricity. Hence ensuring the full coverage of investment costs of a heat pump and PV system should be considered in Slovenia for households, experiencing energy poverty. This would be in line with Slovenia's Action plan for the reduction of energy poverty, where the involvement of people experiencing energy poverty in renewable energy communities

	<p>is planned. However, the government should stimulate the implementation of this measure in the near future.</p>
<p>VULNERABLE POPULATION THAT DOES NOT MEET The ECO FUND ELIGIBILITY CRITERIA FOR ENERGY POVERTY</p> <p>There are segments of the population that are not recipients of social benefits and not eligible for Eco fund ´s subsidy covering 100% of investment costs but still have difficulties to finance renovation measures. This segment of the population is also difficult to identify.</p> <p>Especially the elderly (retirees) are vulnerable to such a situation. This segment of the population is particularly relevant in Slovenia because 43% of buildings and homeowners are pensioners. Older owners might find it more difficult to make major renovation investments due to limited financial capacity and the longer payback period.</p>	<p>This challenge can only be tackled by the coordination between social and environmental actors (energy poverty), specifically it needs to be addressed by national social policies, as highlighted by many social organisations.</p> <p>An option to explore would be, how to develop and channel local/municipal funds to focus on vulnerable households that are not recipients of social benefits (and not covered by Eco fund ´s energy poverty subsidy scheme). There is already a good practice example from Trbovlje, where the municipality matched the Eco fund subsidy (approx. 25% of investment) with its own funds for the EE measure of changing old heating devices.</p> <p>Another option is to explore options for funding renovations under the Social Climate Fund.</p>
<p>LACK OF REGIONAL and LOCAL FUNDS FOR ENERGY RENOVATIONS</p> <p>At the municipal level, there are possibilities to create dedicated funds to stimulate investment in energy renovation of buildings, but these are very limited due to the very low level of fiscal autonomy.</p>	<p>The government should consider legislative changes in the area of local fiscal policy in the direction of more autonomy for dedicating local funds for renovation, as this could significantly improve the situation.</p>
<p>RISE OF ENERGY PRICES</p> <p>Although the government of Slovenia has been managing energy price hikes since the</p>	<p>The existing concessions given by the municipalities to the chosen heating providers</p>

<p>start of the war in Ukraine, energy prices have risen. This is closely linked to the increase in energy poverty.</p> <p>In Hrastnik and Trbovlje – two of the municipalities in Zasavje – households connected to the district heating system are facing high costs of heating, a problem the households have voiced. Often even in the case of already renovated households the heating costs remain too high to afford with ease.</p>	<p>(in the case of Hrastnik the company Petrol) should be reevaluated due to the high costs for households.</p> <p>However, also alternatives for heating should be considered by the relevant local actors, such as the municipalities or utilities.</p> <p>Due to the large differences in district heating prices on the national level, the National Energy Agency could review the current methodology for determining district heating prices.</p>
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2.1.3 Legal and administrative barriers and challenges

BARRIERS AND CHALLENGES	MEASURES FOR OVERCOMING BARRIERS AND CHALLENGES
<p>COMPLEX APPLICATION PROCESS FOR FUNDING</p> <p>The complexity of the application process to apply for Eco fund subsidy can present a challenge to households experiencing energy poverty.</p>	<p>As part of the subsidy scheme Eco fund aimed at alleviating energy poverty (ZER 2024) provides a coordinator for households, which guides people through the application process. However, there is a lack of awareness of this option (see awareness obstacles).</p> <p>It is important that people are aware of the very first steps of the application process (e.g. where to find the application) and the application process. The key information for the households is that coordinators are available to help with the application process and ways to contact these coordinators. All the next steps can be guided by the coordinator.</p>

	<p>We suggest that a list of coordinators be available at Centers for Social Work and other relevant institutions and local organizations that are in contact with vulnerable households.</p>
<p>CHOOSING A CONTRACTOR</p> <p>Households can find it difficult to search for, choose and communicate with contractors.</p>	<p>Eco fund maintains a list of contractors. The list is informative and can help households with the search for a contractor. Eco fund places on the list of contractors every contractor who has completed the application form for entry into the list and has a registered activity for the implementation of measures according to the public call ZER. Eco fund does not check the liquidity and references of contractors before including them on the list.</p> <p>Municipalities, which have a better overview of contractors in their local area, could also maintain and annually publish lists of contractors in the region.</p>
<p>PROFORMA INVOICES from CONTRACTORS</p> <p>For a household to obtain funding from Eco fund aimed at alleviating energy poverty (ZER 2024) and sign a tripartite contract between the household, Eco fund and contractor, the household needs to obtain a proforma invoice from the contractor(s). These invoices often do not match the criteria and guidelines of Eco fund, leading to a delay in the process.</p>	<p>Eco fund is addressing this challenge by issuing guidelines for the proforma invoices. Households need to be aware of these guidelines and communicate them with the contractors. It is recommended that the Eco fund sends the guidelines to the household upon initial acceptance of the application.</p> <p>In addition, the coordinators who support the households, must be made aware of these guidelines by the Eco Fund.</p>
<p>ILLEGAL BUILDINGS</p> <p>People facing energy poverty can live in illegally constructed buildings, which are not</p>	<p>Efficient processes that enable the legalisation of already constructed buildings can help</p>

eligible for subsidies. The legalization process can sometimes cost more than €3000 ²³ .	overcome this obstacle (satellite imaging makes it easy to determine the year of construction).
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2.1.4 Awareness and trust barriers and challenges

BARRIERS AND CHALLENGES	MEASURES FOR OVERCOMING BARRIERS AND CHALLENGES
<p>HOUSEHOLDS</p> <p>Lack of awareness of the benefits of energy renovations, availability of funds and eligibility for those funds.</p>	<p>Communication campaigns on the benefits of renovation by local actors. However, the precondition is awareness raising on renovation benefits among local actors, who are in regular touch with vulnerable households.</p> <p>To promote funding available, coordinated efforts by centers for social work, humanitarian organizations, medical workers and any other actors who are in touch with vulnerable households are needed.</p>
<p>HOUSEHOLDS</p> <p>Lack of trust in contractors.</p> <p>Lack of trust in national actors.</p>	<p>One measure to address this challenge has already been adopted by the Eco fund, namely the on-site visit and supervision by the Eco Fund of the renovation process and the work of contractors.</p> <p>Direct contact with households experiencing energy poverty should be mediated by trusted actors with whom the households have experience (e.g. centers for social work, and social organisations, etc). Small meetings with people, experiencing energy poverty are</p>

²³ Moj mojster (2025) Legalizacija objekta – cena: <https://www.mojmojster.net/cene/legalizacija>.

	needed instead of big workshops with all actors.
ONE-STOP-SHOP (OSS) Questionable effectiveness of existing one-stop-shops (OSS)	Community outreach programs can be a better option than OSS for raising awareness of the benefits of energy renovations and the availability of funds, or at least they need to be combined with OSS. In Slovenia, there is a network of energy advisers, which could act as OSS, but are usually not a very suitable solution for people, experiencing energy poverty, as they are either not aware of them or are afraid to visit them. However, combining OSS with community outreach programs could be a good approach.

2.2 Identifying all relevant actors and stakeholders

Renovation in households that are experiencing energy poverty is a complex process, not only characterized by technical and financial challenges, but also by challenges related to habits, fears, community etc. Because of this, it is highly important that a network of key actors and stakeholders is in place to support the renovations. It is important that the actors and stakeholders are present and connected on the local level, but also the coordinated action and connections between actors and stakeholders at the national level are important. This chapter provides a list of actors and stakeholders both at the local and at the national level, who are relevant for the orchestrating of the renovation of households experiencing energy poverty, in rural areas, according to the guidelines of this REER, with a focus on single-family houses.

Key actor or stakeholder	Level	Role (in the energy renovation process)	Link
Ministry of Environment, Energy and Climate	National	Responsible for shaping policies and measures related to tackling energy poverty	Link
Ministry of Labour, Family, Social Affairs and Equal Opportunities	National	Responsible for shaping social support, also co-shaping policies and measures related to tackling energy poverty	Link

Ministry of Natural Resources and Spatial Planning	National	Responsible for keeping national real estate records and shaping policies regarding building permits.	Link
Ministry for Solidary Future	National	Responsible for shaping housing policies and measures (also rental sector)	Link
Ministry of Health	National	Ministry, responsible for shaping health policies and measures	Link
Eco Fund, Slovene Environmental Public Fund	National, regional, local	Responsible for delivery of subsidies for the renovation of households, also the ones that are experiencing energy poverty	Link
ENSVET – Energy Advising Network	National, local	Provides energy advising services to households, as well as the ones experiencing energy poverty.	Link
Municipality of Zagorje	Local	Owens and rents apartments, directs and manages municipal funds, manages concession tenders and contracts local energy suppliers (heating), and establishes energy communities.	Link
Municipality of Trbovlje	Local	Owens and rents apartments, directs and manages municipal funds, manages concession tenders and contracts local energy suppliers (heating), and establishes energy communities.	Link
Municipality of Hrastnik	Local	Owens and rents apartments, directs and manages municipal funds, manages concession tenders and contracts local energy suppliers (heating), and establishes energy communities.	Link
Association of Municipalities and Towns of Slovenia	National, local	Provides outreach to municipalities in Slovenia	Link
The Association of Municipalities of Slovenia	National, local	Provides outreach to municipalities in Slovenia	Link
Local energy agencies	Regional, local	Provide energy know-how and support for a variety of actors	Link
Regional Development Agency Zasavje	Regional, local	Implements development-related tasks in Zasavje.	Link

Regional development agencies	Regional, local	Implement development-related tasks.	Link
Local Action Group Zasavje	Regional, local	Promoting sustainable rural development by uniting various sectors in Zasavje (public, private, civil society sector). Carries out and provides funding for local projects that aim to enhance social inclusion, lower developmental differences across the region, stimulate the economic development of the region and contribute to nature and environmental protection in the region.	Link
Local Action Groups	Regional, local	Promoting sustainable rural development by uniting various sectors (public, private, civil society sector).	Link
Green Hrastnik - Local Energy Community	Local	Can include households experiencing energy poverty to provide them with clean energy or to support energy renovation.	Link
Centre for Social Work Zasavje	Regional	Provides social support and services to vulnerable groups regionally	Link
Centre for Social Work Zagorje	Local	Provides social support and services to vulnerable groups locally	Link
Centre for Social Work Trbovlje	Local	Provides social support and services to vulnerable groups locally	Link
Centre for Social Work Hrastnik	Local	Provides social support and services to vulnerable groups locally	Link
Centres for Social Work	Regional, local	Provide social support and services to vulnerable groups locally	Link
Community of Centers for Social Work	National, regional, local	Connects centres for social work nationally	Link

Red Cross Zagorje	Local	Provides humanitarian assistance and social support and services to vulnerable groups locally	Link
Red Cross Trbovlje	Local	Provides humanitarian assistance and social support and services to vulnerable groups locally	Link
Red Cross Hrastnik	Local	Provides humanitarian assistance and social support and services to vulnerable groups locally	Link
Red Cross of Slovenia	National, regional, local	Provides humanitarian assistance and social support and services to vulnerable groups locally	Link
Caritas Zagorje	Local	Provides humanitarian assistance and social support and services to vulnerable groups locally	Link
Caritas Trbovlje	Local	Provides humanitarian assistance and social support and services to vulnerable groups locally	Link
Caritas Slovenia	National, local	Provides humanitarian assistance and social support and services to vulnerable groups locally	Link
ZPM Slovenije	National, local	Provides humanitarian assistance and social support and services to vulnerable groups locally	Link
ZPM Moste Polje	National, local	Provides humanitarian assistance and social support and services to vulnerable groups locally	Link
Slovene Philanthropy	National, local	Promotes and organizes volunteers and thereby provides humanitarian assistance and social support and services to vulnerable groups locally	Link

Association of Pensioners' Societies	National, local	Connects pensioners' associations and reaches out to pensioners	Link
Local construction companies and contractors for different renovation measures	Regional, local	Provide services and equipment needed for renovation	
Utility Komunala Zagorje	Local	Provides utility services to the households and can impact the prices of these services	Link
Utility Komunala Trbovlje	Local	Provides utility services to the households and can impact the prices of these services	Link
Utility Komunala Hrastnik	Local	Provides utility services to the households and can impact the prices of these services	Link
Local utilities	Local	Provide utility services to the households and can impact the prices of these services	Link
Institute for the Protection of Cultural Heritage of Slovenia	National, local	Prescribes rules for renovation of objects, subject to cultural heritage rules (such as miners' colonies in Zasavje)	Link
Manufacturers and suppliers of products, equipment and services to increase energy efficiency	Local	Provide works, equipment and services, needed for energy renovation	
Local administrative units	Local	Issue building permits.	
Local administrative unit of Hrastnik	Local	Issues building permits.	Link
Local administrative unit of Trbovlje	Local	Issues building permits.	Link
Local administrative unit of Zagorje ob Savi	Local	Issues building permits.	Link

The actors can have different roles in overcoming challenges related to energy renovation of households experiencing energy poverty. One of the biggest obstacles is raising awareness among households on the availability of the Eco fund subsidies that cover 100% of investment

costs. Actors with a **decisive role in addressing challenges related to awareness and trust** are the Eco fund, municipalities, Centers for social work and local actors (humanitarian organisations, healthcare workers, LAGs etc.).

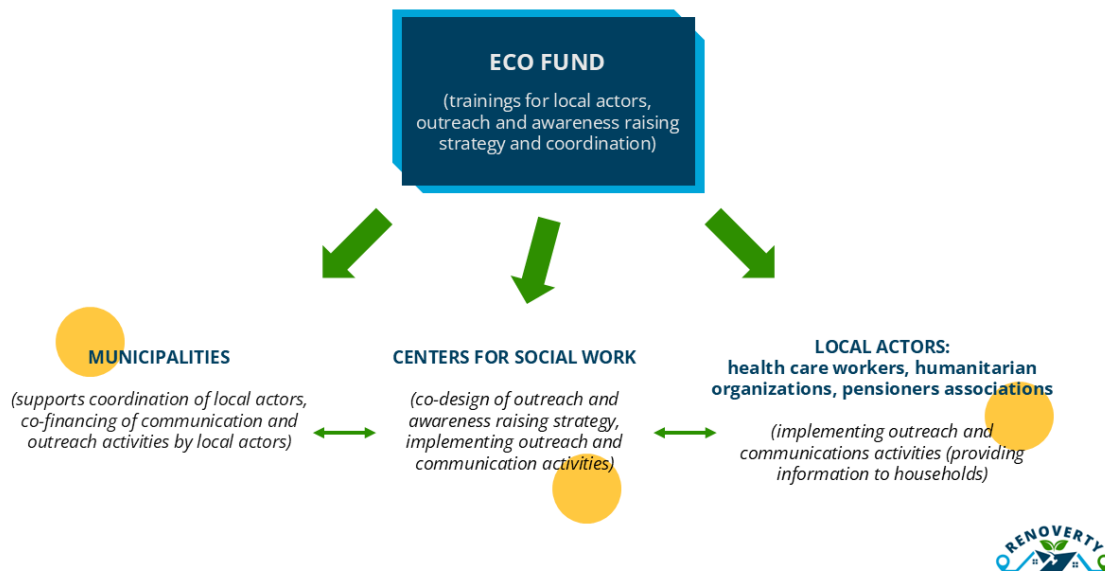


Figure 10: Role of actors (addressing awareness and trust-related challenges)

2.3 Leveraging (EU) financial mechanisms

Leveraging the funds, which are or will be made available through the Recovery and resilience facility/plan (RRF), National Energy and Climate Plans (NECP), RePowerEU, Social Climate Fund and Cohesion funds offer potential for addressing energy poverty in Slovenia.

Perhaps the most significant opportunity to address energy poverty in Slovenia are EU cohesion funds, which have an ongoing program and financing until 2027. Cohesion funds are already being used by Eco fund to finance energy renovation measures and could be used also by municipalities to fund renovation measures.

The RRF can fund renewable energy installations, energy efficiency upgrades, and social housing improvements aligned with NECP. However, the financing related to RRF focuses on the energy renovation of public buildings, including energy renovation of publicly owned residential buildings. Hence, the RRF funds can be leveraged especially to address energy poverty related to rental situations (e.g. tenants in apartments owned by municipalities etc.)

RepowerEU is one of the pillars of the Recovery and Resilience Plan of Slovenia. Its funding focuses on measures improving energy efficiency of the economy and increasing the share of renewables. The latter could be an opportunity for measures to include households experiencing energy poverty in RES energy communities or to finance the later steps of energy renovation in

households experiencing energy poverty (combined installations of heat pumps and solar power plants).

Social Climate Plans, required under the Social Climate Fund (SCF), directly address the challenges of vulnerable groups by funding targeted measures, including energy efficiency upgrades and clean energy adoption, helping alleviate energy poverty nationwide. Slovenia has included some elements of alleviating energy poverty in all the listed measures, but as the Social Climate Plans are currently just in the making, this represents an important opportunity to introduce further measures for alleviating energy poverty.

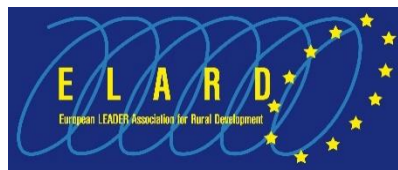
2.4 Scalability and replicability

Scalability and replicability are critical factors in ensuring that the roadmap for the renovation of households that are experiencing energy poverty is made available to all relevant actors. These principles ensure that successful strategies can be expanded and adapted to different contexts, reaching a larger population and creating a broader impact.

When composing the REER, attention was paid that the document is composed in a manner to allow scalability and replicability.

To ensure the REER with an emphasis on the national/regional or local benefits of energy renovations proposed in REER, is able to reach all relevant actors, the following activities are planned to ensure the scalability and replicability of the REER: _

- presenting the REER, particularly section 2, to larger national level audiences (ministries, Eco fund, Borzen, researchers, NGOs working in the field of sustainable energy and social affairs),
- presenting the REER, particularly section 1, at annual events of relevant social actors (Centres for social work, humanitarian organizations etc.),
- present the REER to Eco Fund energy advisers and coordinators,
- present the REER to the national network of municipalities,
- mapping other regions to identify stakeholders needed to replicate the REER.



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