



SMARTER Finance for EU

Launching new taxonomy-aligned green homes and green mortgages program in the EU – SMARTER finance improving energy security and citizens' health comfort and financial wellbeing by engaging banks and residential investors

The SMARTER4EU project has received funding from the European Union's LIFE Clean Energy Transition Programme under grant agreement no. 101121060



Co-funded by
the European Union



Document summary information

Grant Agreement No	101121060 EU LIFE	Acronym	SMARTER4EU
Full Title	SMARTER Finance for EU Launching new Taxonomy aligned green Homes & green Mortgages programs in the EU – SMARTER Finance improving energy security and citizens health comfort and financial well-being by engaging banks and residential investors		
Start Date	01/ 06/ 2023	Duration	24 months
Project URL	https://www.smarterfinance4.eu/		
Deliverable	D5.1 Toolkits - Recommended green homes renovation solutions		
Work Package	Work package 5: Hybrid Green Finance Tools for Vulnerable Citizens		
Contractual due date	31/03/2024	Actual submission date	03/05/2024
Nature	Report	Dissemination Level	Public
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Revision history (including peer reviewing & quality control)

Version	Issue Date	Stage	Changes	Contributor(s)	Comments
1	12/01/2024	1 st draft		Ana Cardoso, Joana Fernandes, Isabel Pereira	
2	24/01/2024	2 nd draft	content control and language edits	Steven Borncamp, Iva Merheim-Eyre	
3	15/04/2024	3 rd draft	language edits	Jeff Colley	
4	03/05/2024	Final version	formatting edits	Ana Cardoso	

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Glossary of terms and abbreviations used

Abbreviation / Term	Description
EDEPI	European Domestic Energy Poverty Index
EPAH	Energy Poverty Advisory Hub
EU	European Union
NECP	National Energy and Climate Plans

1 Introduction

1.1 Addressing the SMARTER4EU description of action

SMARTER4EU GA requirements	Section(s) of present deliverable addressing SMARTER4EU GA	Description
WP5	<i>Entire document</i>	<i>This document contains information focused on solutions for households experiencing energy poverty, describing what it is and the recommended green homes renovation solutions.</i>

Table 1 - Deliverable's adherence to SMARTER4EU objectives and Work Plan

1.2 Summary

The aim of this document is to provide information to Green Homes & Green Mortgage (GHGM) program implementing partners, regarding energy poverty and renovation solutions for energy poverty mitigation. This information is to be integrated into their toolkits in accordance with Deliverable “D3.8 – Toolkits for financial institutions, investors and developers on benefits of GHGM programs”.

2 What is energy poverty?

Energy poverty occurs when a household must reduce its energy consumption to a degree that negatively impacts the inhabitants' health and wellbeing. It is mainly driven by three underlying root causes: (i) high proportion of household expenditure spent on energy; (ii) low income; and (iii) low energy performance of buildings and appliances (European Commission, 2023).

According to Eurostat data for 2022, a combination of high energy prices and the cost-of-living crisis contributed to an increase in energy poverty, with an estimated 9.3% of Europeans (approximately 40 million people) across all member states unable to keep their homes adequately warm, compared to 6.9% in 2021. According to the same source, 95.3 million people (21.6% of the EU population or over 1 in 5 citizens) were at risk of poverty or social exclusion in 2022, meaning they lived in households experiencing at least one of the three poverty and social exclusion risks (risk of poverty, severe material, and social deprivation and/or living in a household with very low work intensity) [4].

The 2023 European Commission recommendation on energy poverty [8] stated that **energy poverty** is a multi-dimensional phenomenon, driven primarily by three underlying root causes: **high energy expenditure in proportion to a household's budget, low levels of income, and low energy performance of buildings and appliances**.

The recently adopted revision of the Energy Efficiency Directive [7] also addresses energy poverty, including an EU-wide definition of energy poverty for the first time. According to the directive, energy poverty includes cases where households lack access to essential energy services to provide basic levels and decent standards of living and health. This includes adequate heating, hot water, cooling, lighting, and energy to power appliances, and considers the applicable national context, existing national social policy, and other relevant national policies. Energy poverty is taken to be caused by a combination of factors, including at least non-affordability, insufficient disposable income, high energy expenditure and poor energy efficiency of homes. In light of this definition, the EU's legal framework requires that energy poverty in member states is identified and tackled in national energy and climate plans (NECPs), including a timeframe and outline of relevant policies.

Put simply, energy poverty can be understood as a “situation where a household cannot meet its domestic energy needs”, and it is possible to assess the scale of energy poverty in the EU in several ways. The revised Energy Efficiency Directive [7] proposes **four main indicators** to be considered by member states when assessing energy poverty: (i) inability to keep home adequately warm; (ii) arrears on utility bills; (iii) population living in a dwelling with a leaking roof, damp walls, floors or foundation, or rot in window frames or floor; and (iv) the at-risk-of-poverty rate.

Prior to the directive's new definition, a methodology for measuring energy poverty and a **set of indicators** was published in the 2020 commission recommendation on energy poverty [6]. This recommendation identified 13 key indicators based on available Eurostat data, along with other data availability, subject to reliability, and robustness. The indicators cover the three energy poverty angles: low-income households, a high share of spending on energy and housing with poor energy efficiency. A dashboard with indicators used for national and European level measurement is also available on the [commission website](#) [10], together with guidance for addressing the measurement of energy poverty at the local level.

Additionally, to assist with measuring energy poverty at the local level, the Covenant of Mayors for Climate and Energy-Europe, supported by the Energy Poverty Advisory Hub (EPAH) and the Joint Research Centre, proposed a set of 56 local energy poverty indicators for assessing and monitoring energy poverty [11]. Grouped into six macro-areas, these indicators can be used for the Covenant of Mayors reporting while the monitoring framework serves as an instrument for planning and implementation of energy poverty measures.

Another example is the European Domestic Energy Poverty Index (EDEPI) [9], which ranks member states based on their progress in alleviating domestic energy poverty, considering both summer and winter energy poverty. Figure 1 provides the EDEPI scores, revealing, Portugal, Italy, and Spain as having low scores, because they must simultaneously alleviate summer and winter energy poverty. The latter can be addressed by insulating homes and

improving energy efficiency of heating systems, while the former requires a combination of insulation, passive cooling solutions, and efficient cooling/ventilation systems.

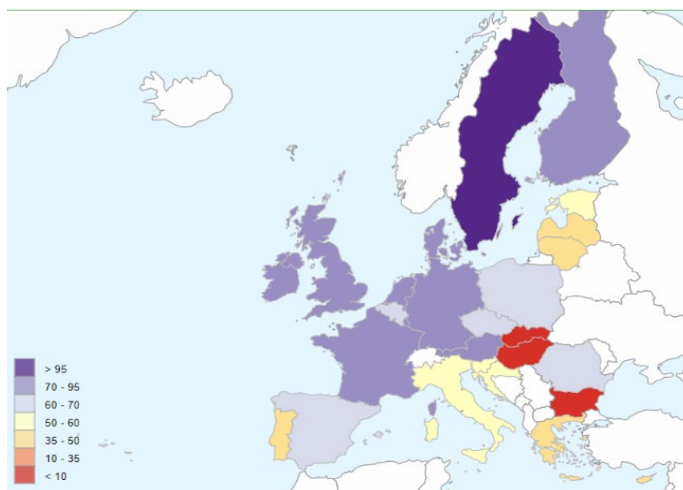


Figure 1 - Domestic energy poverty index scores.
Source: EDEPI, 2023

3 Renovation solutions for energy poverty mitigation

A 2019 European Commission [2] report on building energy renovation activities stated that a common understanding of what renovation “rate” and “depth” mean was needed. Therefore, first, clear definitions for different renovation depths, relating them to non-renewable primary energy savings achieved in a specific calendar year were defined as:

- Below threshold ($x < 3\%$ energy savings)
- Light renovations ($3\% \leq x \leq 30\%$ energy savings)
- Medium renovations ($30\% < x \leq 60\%$ energy savings)
- Deep renovations ($x > 60\%$ energy savings)

It should be noticed that, in practice, “below threshold”, “light” and “medium” renovations are more common than “deep” renovations, meaning that typically only a **few efficiency measures are implemented**. Therefore, if the goal is the actual improvement of the building’s energy performance, along with the implementation of non-energy green standards, **preference should be given to deep renovations** that have a greater impact potential. The SMARTER4EU system functions as good support for this goal as it provides a list of measures to improve both the energy efficiency and overall sustainability of buildings and is aligned with the EU Taxonomy for Sustainable Activities (activities such as building renovation are covered by the EU Taxonomy technical screening criteria).

The type of works that can be considered as energy renovation activities include measures such as **window replacement, installation of thermal insulation on the façade or roof, replacement of old and inefficient space heating generator/water heater/space cooling systems - or first-time installation in buildings without such systems. Other measures include installation of photovoltaic and/or solar thermal systems and new lighting installations.**

In recognition of renovation’s key role in reaching the 2050 climate neutrality target, the commission published the strategy “A Renovation Wave for Europe – Greening our buildings, creating jobs, improving lives” to boost renovation in the EU [3]. This initiative places tackling energy poverty and the worst-performing buildings at the centre. As the commission states, renovations have two recognised positive economic impacts: decreasing energy costs, and thereby alleviating energy poverty, and improving employment opportunities in the building sector.

According to the 2023 commission recommendation on energy poverty [8], **priority should be given to the renovation of buildings with the worst energy performance to directly address energy poverty**, since people affected by energy poverty and vulnerable people tend to live in such buildings. As a consequence of such renovations, energy needs for heating and/or cooling are substantially reduced, and the inhabitants can experience a comfortable indoor climate with lower energy bills, while also contributing to greenhouse gas reduction goals. This isn’t just about saving energy or cutting emissions: the indoor environmental quality and comfort improvements associated with these renovations can improve the overall quality of life for households experiencing energy poverty.

Furthermore, the commission staff working document accompanying the commission recommendation on energy poverty [4] reinforces that **energy efficiency improvement of buildings is key to tackling energy poverty**. Additionally, energy renovation of buildings can generate and preserve jobs and economic activity that indirectly contributes to the welfare of the population and reduces poverty. It is also stated that, currently, approximately 35% of the EU’s buildings are over 50 years old and 75% of the EU’s building stock has a poor energy performance. The same commission staff working document highlights that renovating existing buildings can **significantly reduce the EU’s total energy consumption** by 5-6% and **lower carbon dioxide emissions** by about 5%, and that to meet the EU’s climate, social and energy objectives, the current rates of renovations should at least double.

To this end, the commission 2023 recommendation on energy poverty [8] set some **major recommendations** regarding renovation, namely:

1. Actions should be taken to accelerate the renovation rate of buildings with the worst energy performance in away that ensures at least as much savings as the household needs to achieve adequate indoor thermal comfort.
2. Regulatory and social safeguards should be established, and the policy mix analysed, to ensure that housing costs following energy efficiency improvements or renovations of dwellings do not result in excessive

increases in rents and housing costs, which can lead to unaffordability issues, displacement of residents, evictions, and gentrification.

3. Attention should be paid to the design of specific energy efficiency support schemes targeting households affected by energy poverty. When setting up these schemes, Member States should keep in mind that these households cannot afford paying the upfront costs of renovation, although they would be reimbursed afterwards, and that they do not benefit from tax-related bonuses and deductions as their income tax is minimal.

On the third point, **municipalities can play a crucial role** as potential providers of guarantees, which may facilitate private investments into these households, or even provide the necessary investment upfront. Concrete examples may be found in the SMARTER4EU Catalogue of Good Practices.

In this sense, initiatives such as the Irish Warmer Homes Scheme [1] should be kept in mind. This scheme targeted vulnerable households and energy poor homes providing advice and funds for energy efficiency measures. From 2000 to 2013 over €82 million was distributed through the scheme and more than 95,000 homes were supported. The energy efficiency interventions included measures such as: **attic insulation, draught proofing, efficient lighting, and cavity wall insulation**. In 2010, the implemented measures saved 25 GWh and many beneficiaries were lifted out of energy poverty. Moreover, the number of beneficiaries who found it difficult or impossible to pay utility bills on time decreased from 48% to 28%. The number of families with children who could keep a comfortable temperature at home increased from 27% to 71%, and the number of beneficiaries who suffered from long-term illness or disorders decreased by 88%.

Another noteworthy programme to be considered is the Portuguese “Vale Eficiência” (**efficiency voucher initiative**) initiative. This scheme assigns economically vulnerable families an “efficiency voucher” worth €1,300 plus VAT, with families able to apply for up to three of these vouchers. This allows eligible households to improve the energy performance of their home either by carrying out interventions to the building envelope or by replacing or purchasing energy-efficient equipment and solutions. There are several “passive interventions” such as thermal insulation of roofs, walls, or floors or replacing doors and/or windows, that can be put into place. “Active interventions” can also be taken, such as heating and/or cooling systems and/or domestic hot water installation (heat pumps, solar thermal systems, boilers, and biomass heat exchangers) and/or renewable energy microgenerators such as solar PV. The beneficiary families are assisted in acquiring an energy efficient solution, including its installation. The funds for this initiative are from the recovery and resilience plan, and the technical support is given by ADENE – Portuguese energy agency. The goal is to support 100,000 families between 2021 and 2015, with an investment of €130 million.

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