European Energy Network

A voluntary network of European energy agencies

Energy Poverty mitigation in Europe

Potential role for Renewable Energy Communities

March 2023

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The full study and annexes are available at https://enr-network.org/energy-poverty-mitigation-in-europe-potential-role-for-renewable-energy-communities/

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About the Study

This publication is an EnR study produced under the 2022 Presidency by ADENE, the Portuguese Energy Agency. It aims at providing the best available knowledge based on policy implementation across EnR member countries. The expressed conclusions do not imply policy positions of individual countries. The European Energy Network (EnR) or any person acting on behalf of EnR is not responsible for the use that might be made of this publication.

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Slovak Innovation and Energy Agency	Swedish Energy Agency	Sustainable Energy Development Agency, Bulgaria

Executive Summary

The present study was carried out by the European Energy Network, EnR, under the Presidency of ADENE in 2022 and focuses on the role of renewable energies in energy poverty mitigation. It presents the result of a survey answered by fourteen EnR member countries regarding policies, programs, and their status concerning energy poverty and Renewable Energy Community implementation.

The study was coordinated by ADENE and the Steering Committee included ADEME (FR), dena (DE), RVO (NL), AEA (AT), CRES (GR), ENEA (IT), EST (UK).

The objectives of this study were the following:

- General overview of energy poverty status across EnR member countries, including main measures and legislation in place to tackle energy poverty with a relevant contribution from renewable energy, and the critical role played by energy agencies in their implementation, present and future;
- Identification of main drivers and barriers that can influence energy poverty mitigation strategies, using the proposed assessment framework methodology;
- Discussion and insights into the role of energy production decentralization (and renewable energy communities in particular) towards mitigation of energy poverty and how energy agencies can enable the opportunities identified;
- Workshop (brainstorming) with EnR member agencies on the recommendations and conclusions provided by the current study.

The study involved the participation of 15 countries (14 EU-member states + 1 non-EU member state) - Austria, Bulgaria, Netherlands, France, Greece, Italy, Luxembourg, Portugal, Slovakia, Spain, Sweden, Croatia, Germany, Lithuania, and the United Kingdom. Information was gathered through a survey carried out with the E^{n}R Energy Agencies of these countries (AEA, SEDA, Motiva Oy, ADEME, CRES, ENEA, Klima-Agence, ADENE, SIEA, IDAE, SEA, and EST).

The collected information concerned:

- Definition of energy poverty;
- Main issues considered for the energy poverty definition;
- Up-to-date energy poverty indicators and other indicators regarding energy poverty per country;
- National strategies or plans to mitigate energy poverty (and the types of energy poverty measures included, activities/programs already implemented or being defined in the different areas);
- Main barriers to implement national strategies or plans;
- Funding and financing sources for energy poverty mitigation;
- Projects implemented or being designed to mitigate energy poverty that include Renewable Energy Communities (REC), including the type/cluster, most important solutions adopted, stakeholders involved, and other benefits obtained;
- EnR agencies' participation (in the design and implementation of the national strategy or plan);
- Special measures to mitigate rising energy prices, considering the current new framework (COVID-19, war in Ukraine, and consecutive increases in energy prices).

The main results of the survey about the status of energy poverty in Europe and the potential role of Renewable Energy Communities were as follows:

- Eight out of 14 countries do not have a definition of energy poverty.
- Four out of 6 countries with a definition of energy poverty are located in Southern Europe.
- Eleven out of 14 countries considered low income as the main issue related to energy poverty, followed by energy costs.
- Seven out of 14 countries have more up-to-date information regarding primary indicators used in the Energy Poverty Observatory.
- Seven out of 14 countries have other indicators to describe energy poverty.
- Nine out of 14 do not have a national strategy or plan to mitigate energy poverty.
- All the countries with plans or strategies stated that these instruments are related to information provision, renewable energies, energy saving, financial intervention, and consumer protection.
- Ten out of 14 countries have activities/programs already implemented to mitigate energy poverty.
- Five out of 9 countries considered energy saving measures as the most relevant type of initiatives already being implemented.
- Thirteen out of 14 countries state the identification of energy-poor households as the main barrier to implement the national strategy or plan.
- Eight out of 10 countries that responded regarding financing stated that subsidies are the most implemented funding and financing sources.
- Seven out of 14 countries have Renewable Energy Communities' projects directly connected to energy poverty mitigation.
- Five out of 7 countries referred that REC present additional benefits to lower energy prices, the main type identified is thermal comfort.
- Ten out of 14 countries have EnR Members agencies involved in the design of the national strategy or plan to mitigate energy poverty, assuming as their main roles technical support for policy design and promotion/dissemination in the implementation phase.
- Ten out of 14 countries do not have a department/area responsible for energy poverty in the EnR Members agencies.
- All 14 responding countries have implemented special measures to attend to the current framework (COVID-19 recovery, energy crisis exacerbated by the war in Ukraine).

The main conclusions drawn from the data gathered are the following:

- The formal definition of energy poverty is still lacking in some countries, and this is a key instrument to build a regulatory framework and development agenda, as it is not possible to manage a problem without defining it, and without being able to monitor progress with a set of indicators.
- The main issues included in the definition of energy poverty often overlap with other energy policy concepts such as resilience, energy security, poverty, justice, and sustainability.
- Other aspects of energy poverty, such as the level of thermal comfort at home, damp problems detected, restriction of other essential needs to manage energy payments, etc., bring some interesting conclusions to explore the relationship between various indicators.
- It appears that households considered energy poor are not easy to be identified and are not identical between countries when examined by objective and subjective questions.
- Energy poverty is not easily determined by one indicator. The up-to-date energy poverty indicators information per country is an issue, as several countries do not have information more recent than 2018. According to the Energy Poverty Observatory, 2018 is the year with the largest data set regarding primary indicators (described in the EPOV Indicator Dashboard – Methodology Guidebook: HS021 and HH050 from Consensual-based indicators – EU-SILC Target variables; and M/2 and M2 from Expenditure-based indicators – HBS).
- Most of the countries use other indicators that complement the ones used by the Energy Poverty Observatory such as population in poverty; population living in households unable to maintain the house properly heated; households with social tariff; households whose energy expenditure represents +10% of total earnings; households in poverty whose expenditure with energy represents +10% of total income, among others;
- Most of the countries that responded do not have a national strategy or plan to mitigate energy poverty. This could potentially be a consequence of the lack of a definition of energy poverty. Out of the countries that do have a definition, only one does not have a national strategy to mitigate energy poverty.
- Existing financial measures address mainly the cost of energy rather than the structural causes of energy poverty. This is the case for most of the subsidies and tariff schemes implemented for energy poverty mitigation;
- Tackling energy poverty through local actions such as the creation of Renewable Energy Communities (REC) can inspire a new energy culture and empowerment;
- Decentralized renewable energy generation can additionally provide access to sustainable modern energy services and products;
- It is urgent to put in place long-term solutions like energy efficiency and renewable energy generation, which have the potential to cut emissions and tackle energy poverty simultaneously, especially in the current context of recovery from the COVID-19 pandemic, energy crisis and the war in Ukraine which have exacerbated it, putting Europe at a greater risk of energy poverty;

Guided by the study's findings, a set of recommendations is proposed, including aspects related to building renovation, energy efficiency and specifically regarding Renewable Energy Communities. Many of the solutions that can target energy poverty are common to a general framework of building stock conditions and energy efficiency improvement.

Building Renovation

I. Building Renovation

Support mechanisms for deep renovations | There is an important challenge associated with lack of financial capacity of energy poor households to overcome the initial investments required for deep renovations and improvements that benefit energy efficiency and alleviation of energy poverty. It is important to ensure coherent and consistent dialogue on energy poverty issues, also avoiding the fragmentation of funds that just partially support the renovations and don't consider the whole picture. The creation of support schemes to provide financing for multifamily apartment buildings' deep renovations should also involve technical support. This assistance might cover information provision, audits, consulting, installation of equipment, construction management, and the necessary budget management.

Construction training and education | As evidenced in the EnR study on Green Jobs & Skills, provide training for the construction industry workforce, including construction workers, project managers and designers, is critical to meet the energy transition targets, and therefore is also a critical aspect to mitigate energy poverty. Training should address retrofitting methods guided by sustainable practices. Greening the construction industry will also lead to the creation of a significant number of green jobs, while contributing to provide access to sustainable dwellings, especially for the population in energy poverty.

One-stop-shops | Facilitate access to information about technical and financial support to foster self-renovations.

Promote smart buildings | Encourage an inclusive approach in the access to the design and implementation of sustainable and intelligent building services. Smart buildings contribute to measuring and managing energy consumption and tackling energy poverty. There are benefits for operation & maintenance from the optimization these technologies provide, namely smart indoor comfort control. Measurements and control are key elements to move toward the alleviation of energy poverty.

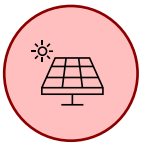
Energy Efficiency

II. Energy Efficiency

Energy Services Companies and Energy Performance Contracts | Explore the role of Energy Services Companies (ESCO) and Energy Performance Contracts (ESCO) in offering financing solutions for the renovation of homes for energy-poor families, so that they can overcome initial high costs. The support of the development of ESCO projects could also scale to regional and local energy agencies. The provision of a potential "public ESCO" player could provide greater confidence to the energy poverty citizens. The services could also cover all stages of the energy efficiency value chain, from energy audits to project design in line with the goals of energy-efficient buildings.

Access to relevant information and promote of energy literacy | Promote greater dissemination of knowledge in the energy area to contribute to energy literacy. The development of inclusive strategies assists in the actions to face info exclusion. Incentives through the promotion of field activities, offering all available information on energy tariffs, tax benefits, and energy efficiency support available on the market.

Support for energy efficiency in rented properties | Low-income households are often tenants and not homeowners, and it is essential to provide support mechanisms that aim to help vulnerable people and encourage energy efficiency in their homes. The involvement of the private rental sector in the design of policies and financing programs is important to guarantee that the most vulnerable population is not excluded from the support and programs that must be designed for them.



Renewable Energy Communities

III. Renewable energy communities

Introduce a comprehensive Energy Poverty Strategy in line with Renewable Energy Communities | Promote a long-term strategy to combat energy poverty developing instruments through renewable energies communities that benefit from the reduction of energy expenditure, energy prices, and access to quality services. It is fundamental to support the participation of vulnerable consumers in energy communities and in collective self-consumption as producers and as consumers.

Support establishment of not-for-profit citizen energy communities | Establish at the local level the creation of energy communities contributes to increasing public acceptance of renewable energy projects and makes it easier to attract private investments. Development of sustainable neighborhoods, eco-quartiers involving municipalities to guarantee compliance with construction, energy standards and the integration of Renewable Energy Communities, specifically including energy poor consumers within the same geographical area.

Secure access to affordable renewable energies | Define objectives to ensure just and democratic access to affordable and clean energy is urgent. In addition to the effect towards fighting energy poverty, energy decentralization increases countries' energy independence.

1. Framework

The European Commission has emphasized the need for alleviating energy poverty, which represents a complex issue, as a key pillar in the context of a just and fair transition within the Green Deal, and the subsequent Renovation Wave.

Energy poverty is severely affecting many European countries, but up until now, only a few comparative analyses have been developed to understand the phenomenon. At the same time, energy savings and energy efficiency are essential for delivering the European Green Deal and the additional targets imposed by the current crisis and geopolitical situation, further increasing the ambition, namely through the Save Gas for a Safe Winter Regulation. Taken together, Europe is currently facing the urgent need to increase the use of renewable energy sources in order to reduce greenhouse gas emissions and decrease the dependence on imported fossil fuels and the concomitant need to mitigate growing energy poverty. Energy efficiency measures are long-term sector-specific interventions that have potential positive externalities, affecting not only direct GHG emissions, but also health costs, reducing inequality and other macroeconomic benefits.

The paramount idea behind this report is to provide insight into the greatest difficulties for consumers faced with energy poverty, focusing on tested solutions that make use of the widespread of renewable energies and energy efficiency literacy dynamics.

In the context of this study, an assessment of the effectiveness of current policy measures is presented, and the facilitating role of energy agencies as enabling agents in the context of Renewable Energy Communities, namely, to combat energy poverty is analyzed.

This study highlights the main avenues for future research and policy development, including the need for greater attention towards local and regional measures to combat energy poverty. The involvement of different decision-making silos, as well as the systemic challenges associated with existing monitoring and policy frameworks, is linked with strategies for fair renewable energy access and financing mechanisms. This study will be of great interest to assist Europe's strategic vision towards reducing energy poverty by leveraging the role of renewable energies in that major undertaking.

The study was coordinated by the Industry and Energy Transition Department (DITE) at ADENE, under the direction of the EnR Steering Committee, composed by ADENE (PT), ADEME (FR), AEA (AT), CRES (GR), dena (DE), EST (UK) and RVO (NL).

2. Objectives

The study summarizes the results from a survey that collected data and views from EnR member agencies about energy poverty status and mitigation measures that include the use of renewable energy, in particular through Renewable Energy Communities. The benchmark covers existing policies, projects and initiatives to mitigate energy poverty, with emphasis on renewable energy generation. The goal is to assess current initiatives, in terms of the number of people involved, installed capacity, and to develop a reference guide for new project strategies and/or policies.

Considering the current global energy crisis, the war in Ukraine, and the Covid-19 pandemic, a short description of special emergency measures was also collected, as these conditions have disproportionate effects on energy-poor households.

An analysis of existing projects and their financing (public/private, for profit/ not for profit, loans, tariff schemes, subsidies, etc.) was made, looking into specific goals, such as reducing energy costs, improving access to sustainable and affordable energy, or improving health conditions.

The purpose of this study is to evaluate how the wide spreading of renewable energy solutions' deployment can help alleviate energy poverty in Europe, with special focus on central and local policy measures.

The role of the energy agencies as dynamic agents is considered, taking into account their potential supporting role for project implementation in the context of energy poverty and renewable energies.

3. Methodology and EnR agencies involved

The EnR member agencies' consultation was developed through a survey to evaluate the status of energy poverty mitigation in Europe, specifically looking at the potential role for Renewable Energy Communities. The goal was to compare the data from different EnR member agencies' countries, and, as a result, infer about the energy poverty status and look ahead into potential future policies and projects which can/should be fostered, from an energy agency's perspective. An analysis of how to better integrate renewable energies and lead to an improvement of public policies in each EnR member agencies' countries was obtained. Case studies were evaluated regarding success factors, barriers, and how to overcome them and better meet policy targets.

The structure of the survey sent to EnR agencies had eight sections and an annex for fact sheets of individual projects/measures/programs.

Section 1 includes general information to identify each energy agency.

Section 2 concerns the existence of an energy poverty definition and the main issues related to its definition.

Section 3 is about the country's status. The most up-to-date Energy Poverty Observatory indicators and other relevant indicators of energy poverty in the country were collected.

Section 4 is about the existence of a national strategy or specific plan to mitigate energy poverty (and which types of measures and programs/activities are being defined or implemented in such strategy), as well as the main barriers for implementation.

Section 5 queries EnR agencies about the funding and financing. The type of financing sources that exist for energy poverty mitigation is explored with a brief description of the adopted solutions.

Section 6 concerns Renewable Energy Communities and energy poverty. Examples of projects involving Renewable Energy Communities (REC) to mitigate energy poverty were described. The type of community, a brief description of the adopted solutions and relevant information to describe the project were collected, including other benefits in addition to the lower energy price.

Section 7 is about the role of the energy agencies, namely inquiring about the participation of the energy agency in the design of the national strategy or plan, as well as the type of support provided. In addition, it explores the role of the energy agencies in the implementation of specific projects or initiatives, as well as the existence of a department/area responsible for energy poverty and the current projects in progress.

Section 8 is about emergency measures. Taking into consideration the current energy crisis, we asked for details on special measures adopted in each country.

In the **annexes**, information is gathered for specific case studies of projects, measures, or programs (Annex 1). The fact sheets include a short description of the project, website if available, type of support provided, the geographical scope of implementation, the type of case study and the identification of the main stakeholders. The agencies are asked for for their analysis of the main success factors and barriers. The case studies are meant to illustrate the role of renewable energies and in particular the deployment of REC to mitigate energy poverty, so there is a section asking for some details regarding it. The fact sheet also includes information about the EnR member agency's role in the case study, if any. Finally, some relevant indicators are collected (investment, energy bill reduction, number of households involved and additional benefits).

Table 1: List of countries / EnR Energy Agencies which responded to the survey

Country	E^{n}R Energy Agency
Austria	AEA - Austrian Energy Agency
Bulgaria	SEDA - Sustainable Energy Development Agency
France	ADEME – Agency for Ecological Transition
Greece	CRES – Centre for Renewable Energy Sources and Saving
Croatia	HERA- Croatian Energy Regulatory Agency
Italy	ENEA - Italian National Agency for New Technologies, Energy and Sustainable Economic Development
Luxembourg	Klima-Agence G.I.E.
Portugal	ADENE – Portuguese Energy Agency
Slovakia	SIEA - Slovak Innovation and Energy Agency
Spain	IDAE - Institute for Diversification and Saving of Energy
Sweden	SEA - Swedish Energy Agency
United Kingdom	EST - Energy Saving Trust
Netherlands	RVO- Netherlands Enterprise Agency

4. Results

The survey results are presented in this section. The analysis performed attempts a comparative analysis to process and interpret the information provided in order to identify the overall trends, areas of strength and weakness, and, in doing so, support future decision-making.

4.1 Definition of energy poverty

Regarding the definition of Energy Poverty adopted by each country, “there is no one metric for energy poverty because there is no single, universally accepted understanding of what it is to be below the energy poverty line. However, energy poverty can be seen as a situation in which **a household lacks a socially and materially necessitated level of energy services in the home**. It is possible to conclude that the condition is predicated upon high energy prices, low household incomes, inefficient buildings and appliances, and specific household energy needs. It is particularly widespread in Eastern, Central, and Southern Europe, where it tends to affect groups who are already vulnerable to income poverty ”[1]. The concept of energy (or fuel) poverty has definitely entered the EU's agenda. In this study, an overview is presented for 14 countries, whose EnR member agencies participated. In the survey, the working definition of energy poverty, where it exists, was analyzed for the common/distinctive elements.

EnR member agencies were asked if there was a definition of energy poverty and, if so, were asked to provide it.

Questions:

Is there a definition of energy poverty in your country?

If yes, please provide the working definition:

Countries with definition of energy poverty are currently (Table 2, Figure 1): Portugal, Italy, Spain, United Kingdom, France, Greece and Croatia. These countries presented the following working definitions:

In **Portugal**, the definition is related with the inability to maintain the house with an adequate level of essential energy services due to a combination of low income, low energy housing performance and energy costs.

In **Italy**, although not an official definition, the Italian National Energy and Climate Plan (NECP) defines energy poverty as a ”difficulty in purchasing a minimum number of energy goods and services or the condition for which access to energy services implies a distraction of resources (in terms of expenditure or income) greater than what is socially acceptable”.

In **Spain**, the National Strategy against Energy Poverty defines that energy poverty is the situation in which a home is found where no basic needs for energy supplies can be met, such as

consequence of an insufficient level of income and which may be aggravated by having an energy-inefficient home.

In the **United Kingdom**, the term 'fuel poverty' is used to refer to households which struggle to afford to keep their homes at a reasonable temperature, but the precise definition varies across the UK as follows: in England fuel poverty is measured using the Low Income, Low Energy Efficiency (LILEE) indicator. Under this indicator, a household is considered to be fuel poor if: a) they are living in a property with a fuel poverty energy efficiency rating of band D or below and b) when they spend the required amount to heat their home, they are left with a residual income below the official poverty line. In Scotland there is a two-part definition whereby a household is considered fuel poor if an after housing costs have been deducted, more than 10% (20% for extreme fuel poverty) of their net income is required to pay for their reasonable fuel needs b) after further adjustments are made to deduct childcare costs and any benefits received for a disability or care need, their remaining income is insufficient to maintain an acceptable standard of living, defined as being at least 90% of the UK Minimum Income Standard (MIS). To take account of the generally higher costs of living in Scotland's remote, rural and island communities, the legislation provides for uplifts to be applied to the MIS for households in these areas. In Wales, a household is to be regarded as living "in fuel poverty" if the household needs to pay more than 10% of their full household income to maintain a satisfactory heating regime. In Northern Ireland, a household is said to be in fuel poverty if it needs to spend more than % per cent of its income on energy costs.

In **France**, the 2010 Environmental Plan (*Grenelle de l'Environment*) states that a person is in energy poverty if they have particular difficulties in getting the energy supply necessary to meet basic needs in their dwelling because of inadequate conditions of revenue or housing.

In **Greece**, the National Strategy for Energy Poverty Alleviation proposes that a household is considered to fall into energy poverty, when both the following conditions are met: total annual energy costs represent less than 60% of the cost of minimum energy requirements and, net annual income is less than 60% of the national median.

In **Croatia**, there isn't an official definition. However, there were some actions directed toward citizens at risk of energy poverty and these are the most socially vulnerable people, already under social benefit schemes (in the form of guaranteed minimal compensation). Hence, energy poverty is related to general poverty. Energy-related issues are not really assessed. However, this should change with the official definition of energy poverty.

Countries without an official definition of energy poverty are currently Sweden, Slovakia, Netherlands, Luxembourg, Lithuania, Croatia, Bulgaria, Austria (Table 2, Figure 1), representing 57% in a universe of fourteen countries that answered the survey.

To establish a formal energy poverty mitigation strategy, it is imperative to recognize and define the problem and then develop measures that encompass the questions raised in the definition. The

development and evaluation of energy poverty mitigation targets depends periodic characterization of the prevalence, severity, and causes of energy poverty.

Table 2: Definition of energy poverty per country

Country	Is there a definition of energy poverty in your country?	
	Yes	No
United Kingdom	X	
Spain	X	
Portugal	X	
Italy	X	
Greece	X	
France	X	
Sweden		X
Slovakia		X
Netherlands		X
Luxembourg		X
Lithuania		X
Croatia		X
Bulgaria		X
Austria		X

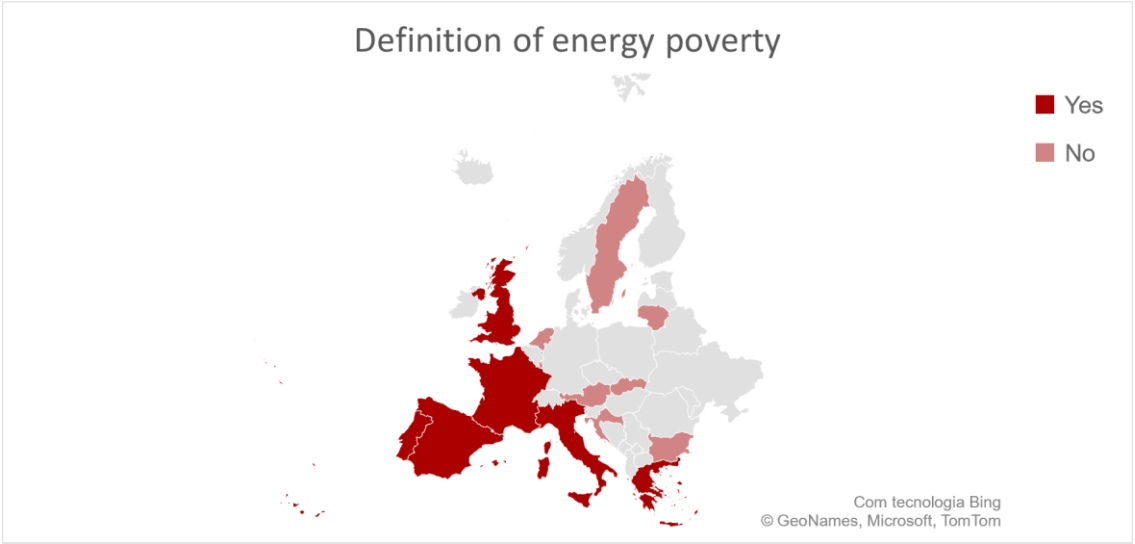


Figure 1: Definition of energy poverty

Taking into consideration the importance of defining a problem to create the right parameters to manage the problem, other variables are analysed, such as geographic location and GDP per capita.

Regarding geographical location, most countries in Southern Europe already have a definition (Figure 1), together with France (Western Europe) and United Kingdom (Northern Europe).

To analyze the answers to the question “Is a definition of energy poverty in your country?” and their possible relationship with economic factors, the Gross Domestic Product (GDP) per capita was considered as a variable to be explored (Table 3). Countries with higher and lower GDP per capita do not have a definition of energy poverty. This may suggest that countries with lower GDP potentially have other problems considered more urgent. Countries with higher GDP potentially do not consider energy poverty as the main priority, as higher incomes allow citizens to meet higher energy bills to keep dwellings adequately warm, if needed. However, in the current scenario, it is expected that energy poverty will likely assume higher priority in all countries due to rising energy prices and the war in Ukraine, which jeopardizes energy security in Europe.

Table 3: Definition of Energy Poverty and GDP – Source: World Bank (2022)

Country	Is there a definition of energy poverty in your country?	GDP per Capita (€)
Luxembourg	No	110 172
Netherlands	No	52 448
Sweden	No	51 610
Austria	No	50 277
United Kingdom	Yes	42 300
France	Yes	40 494
Italy	Yes	33 190
Spain	Yes	29 614
Portugal	Yes	23 145
Greece	Yes	19 583
Lithuania	No	19 455
Slovakia	No	19 329
Croatia	No	14 853
Bulgaria	No	12 328

Regarding the main issues that are addressed in the energy poverty definition, energy agencies were asked to rate issues based on their relative importance using a scale of 1 to 5, where 5 represents the most important issues, 1 the less important ones.

Table 4: Main issues concerning energy poverty

Country	Low income	Low energy performance of the house	Energy costs	Access to essential energy services	Other(s)
Portugal	**5**	**5**	**5**	**5**	0
Netherlands	**5**	**5**	**5**	2	0
Italy	**5**	1	**5**	4	1
Spain	**5**	**5**	**5**	**5**	0
UK	**5**	**5**	**5**	0	0
Bulgaria	**5**	**5**	4	3	0
France	**5**	**5**	4	1	0
Austria	**5**	2	**5**	4	0
Greece	**5**	4	4	4	0
Croatia	**5**	0	0	0	0
Lithuania	**5**	**5**	**5**	3	0

Most of the EnR member agencies from countries with a definition of energy poverty, have considered that **low income** is the main issue related to energy poverty in their countries, followed by **energy costs**.

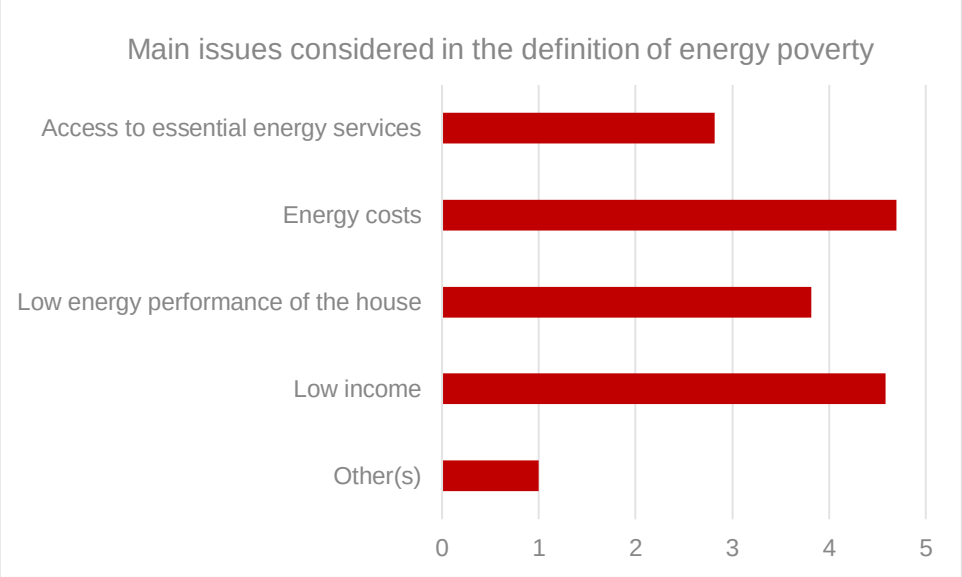


Figure 2: Main issues related to energy poverty
(Average score, on a scale of 1 to 5, where 5 represents the most important issues, 1 the less important ones.)

The definition of energy poverty is not consensual in Europe, with countries adopting a different definition which considers their national reality. However, the different definitions adopted point to some common elements, such as the **ability to meet energy costs**, the **inability to adequately heat dwellings**, or **access to energy services** at an affordable cost.

The European Observatory for Energy Poverty states that the population considered to be in energy poverty is characterized by **inadequate levels of energy services**, particularly in heating and cooling, due to a combination of **high energy costs**, **low incomes**, and **inefficient buildings** and **equipments**.

This definition, including the cost of energy, access to adequate levels of energy services, and the energy performance of housing, leads to a potential situation where energy poverty is not exclusive to families in poverty.

It might be consensual to consider that the population that lives in poverty or close to the poverty line is most likely also in a situation of energy poverty. However, the causes for energy poverty extends far beyond low income. Other factors, which might broaden the scope of the population considered as energy poor, include: Inability to meet energy costs due to rising prices and the increasing weight of energy expenditure in total income; poorly constructed or maintained dwellings (presence of damp, mold, inefficient windows, poorly insulated walls or roofs); lack of access to adequate levels of energy services; use of inefficient equipments to improve thermal comfort. These factors will inevitably increase the weight of energy in total costs for families.

Defining is key to determining, designing and implementing targeted solutions, as well as for monitoring the results of the measures adopted. Determining the population in energy poverty and identifying the most vulnerable consumers is an essential premise for the development and effective measures.

4.2 Country status

The development and monitoring of indicators allows for comprehensive evaluation of energy poverty status in different countries. The analysis of the progress of these indicators is essential to understand the energy poverty situation, its impacts, and to assess mitigation policies' implementation, allowing for continuous updates of plans and strategies. For this, it is important to update indicators regularly and to compare them.

Having up-to-date Energy Poverty Observatory indicators available is an important tool in order to better manage energy poverty policies' development/reassessment. Energy poverty is a multi-dimensional concept that is not easily captured by a single indicator. Besides the Energy Poverty Observatory available indicators, other relevant indicators of energy poverty in the country were also

gathered in the survey. The different approaches followed by each country and the specificities of their energy poverty definition were considered.

Questions:

> *"According to the Energy Poverty Observatory, 2018 is the year with the largest data set regarding primary indicators (as described in the EPOV Indicator Dashboard – Methodology Guidebook: HS021 and HH050 from Consensual-based indicators – EU-SILC Target variables; and M/2 and M2 from Expenditure-based indicators – HBS). Is there more up-to-date information in your country? If yes, please specify your answer:"*
>
> *Is there another indicator that better describes energy poverty in your country?*
>
> *If yes, please specify and provide latest available data.*

The most up-to-date information from Portugal, Italy, Spain, France, Greece, Croatia, Luxembourg, and Lithuania is described below:

Portugal has additional indicators related with population in poverty and living in households unable to maintain the house properly heated: 38% (data from INE,2019). Households with Social Electricity Tariff: 19,3% (data from DGEG,2022). Households with Natural Gas Social Tariff: 1,25% (data from DGEG,2022). Households whose energy expenditure represents +10% of total earnings: 30% (data from INE,2016). Households in poverty whose expenditure with energy represents +10% of total income: 6,6% (data from INE,2016).

Netherlands has additional indicators based on income combined with the housing quality. They are working on these to have the results towards the end of 2022.

In **Italy**, the component of the indicator is the energy expenditure incidence higher than 2 times the annual average; total expenditure (proxy of income) after energy expenditures below the relative poverty line + Households with zero heating expenditure. Total expenditure below the median and the latest value is 8,0% from 2020.

In **Spain**, AROPE rate (the share of the total population who are either at risk of poverty, or severely materially and socially deprived or living in a household with a very low work intensity is 26,4% in 2020, source from INE. At-risk-of-poverty rate in 2020 is 21,0%-18,6% in the situation from the year prior to the interview. According to the Eurostat criteria, the poverty risk threshold is set at 60% of the median income per consumption unit. The household income includes imputed rent. Imputed rent applies to households that do not pay full rent because they own or occupy rented housing at less than market price or free of charge. The imputed value is the equivalent of the rent that would be paid in the market for a dwelling like the one occupied, less any rent actually paid. Likewise, the interest on the loans requested for the purchase of the main home is deducted from the total income of the household. Households with electricity social bonus is 6% in 2021. Households with thermal social bonus is 6% in 2021, source from MITERD. These figures do not include the real number of

potential beneficiaries. The basic requirements to benefit from the social electricity tariff are to have contracted the electricity regulated tariff (Voluntary Price for Small Consumer, PVPC in Spanish) and to have a contracted power equal to or less than 10 kW. All consumers who satisfy both criteria must also meet certain socioeconomic requirements in terms of income level and composition of the family unit. Around 1.3 million consumers benefit from the social bonus in its various categories. By the end of 2021, 50,5% of the beneficiaries were classified as vulnerable, 48,8% as severely vulnerable and less than 1% as at risk of social exclusion.

In **France**, the share of households with energy expenses representing more than 8% of their total expenses, among the households of the three first deciles (i.e., among the 30% poorest households) the latest data is 10,5% (gross value) from 2020 and after weather correction is 11,7%. The other official indicator is about "feeling cold" ("FROID" indicator in French), that is similar to the inability to keep the home warm (answer to the question: "did you suffer of cold for at least 24h during the last winter?") and the latest data is 14% for winter 2019/2020, 20% for winter 2020/2021.

In **Lithuania**, presence of leaks, damp, rot and percentage of citizens given compensation for heating bills.

Regarding the status of the country, according to the Energy Poverty Observatory, 2018 is the year with the largest data set regarding primary indicators (as described in the EPOV Indicator Dashboard – Methodology Guidebook: HS021 and HH050 from Consensual-based indicators – EU-SILC Target variables; and M/2 and M2 from Expenditure-based indicators – HBS).

The Energy Poverty Observatory most recent data regarding primary indicators from Portugal, Italy, Spain, France, Greece, Croatia, Luxembourg, and Lithuania is presented in Table 5.

The indicators used to measure energy poverty provide an approximation of the extent of domestic energy privation, the assessments of indoor housing conditions, and the ability to attain certain basic necessities relative to the society in which a household resides. Those indicators are specific markers that measure the progress of energy poverty and enable the creation of specific strategies and/or follow-up of the strategies already implemented.

Out of the 14 EnR member energy agencies that responded, **8 confirmed having other indicators, besides the Energy Poverty Observatory primary indicators, that better describe energy poverty in their countries** (Table 6).

Table 5: Primary energy poverty indicators per country

Country	HS021 - Arrears on utilities bills (population %)	HH050: Inability to keep home adequately warm (population %)	M/2: Low absolute energy expenditure (population %)	2M: High share of energy expenditure in income (population %)
Portugal	5,3%	16,4%	6,7%	15,1%
Netherlands	1,2%	2,4%	4,4%	10,7%
Italy	6,0%	8,3%	11,8%	14,2%
Spain	9,6%	10,9%	10,31%	16,8%
Sweden	2,2%	1,7%	24,2%	28,7%
UK	9,2%	5,4%	9,2%	18,8%
Bulgaria	19,2%	23,7%	9,3%	11,5%
France	5,4%	6,5%	19,5%	15%
Austria	2,4%	1,7%	14,9%	15,9%
Greece	33%	17,5%	12,8%	16,2%
Croatia	15,2%	7,7%	7,5%	12 %
Luxembourg	2,9%	3,6%	8,8%	11,2%
Slovakia	5,2%	5,8%	7.9%	9,3%
Lithuania	7,27%	30%	14,3%	13,8%

Table 6: Another indicator that better describes energy poverty per country

Country	Is there another indicator that better describes energy poverty in your country?	
	Yes	**No**
Portugal	X	
Netherlands	X	
Italy	X	
Spain	X	
Sweden		X
UK		X
Bulgaria		X
France	X	
Austria		X
Greece	X	
Croatia		X
Luxembourg		X
Slovakia		X
Lithuania	X	

There are other indicators that can be analyzed simultaneously with the Energy Poverty Observatory indicators, such as the indicators from the Eurostat (ESTAT), Statistics on Income and Living Conditions (SILC), and the Building Stock Observatory (BSO). These indicators can provide a snapshot of energy poverty issues, which can then be explored in more detail in research projects on the ground.

When considering a targeted action plan to alleviate energy poverty, it is essential to both identify and define the population living in energy poverty, as well as to monitor the effectiveness in the implementation of measures. Having up-to-date indicators of energy poverty allows for continuous improvement and strengthening of measures targeting energy efficiency of housing, the promotion of support mechanisms, consumer protection and improvements in the legislative and normative domain.

4.3 Policies

The medium and long-term strategies to alleviate energy poverty allow the mobilization and coordination of public and private investment around this common purpose. The development of coherent, transparent, and stable strategies should entail diagnosis and characterization of the energy poverty impacts through monitoring indicators, specific strategies to establish medium and long-term energy poverty reduction goals, at national, regional, and local levels, as well as new methods of funding and financing.

The policies might enable to assist an inclusive approach not leaving vulnerable groups behind. Ensuring to address their needs and offering tailor-made support with local communities, exploiting multiple (social, supply security, environmental, etc.) benefits. This impactful approach enables citizens to become active energy prosumers, paving the way towards sustainable, integrated, and flexible clean energy systems. The increasing of energy supply security and social cohesion, also contribute to ease back on demand and faster end dependency on Russian natural gas and other fossil energy sources in line with the REPowerEU plan. As well as GHG reduction pathways in line with Europe's Green Deal and Fit for 55 package to combat the climate emergency.

Questions:

Is there a national strategy or plan to mitigate energy poverty?

If yes, please identify if the following types of energy poverty measures are available in the plan/strategy.

Are there activities/programmes already implemented or being defined in the different areas?

If yes, please identify which type of measures are already being implemented: Consumer Protection; Financial Intervention; Energy Saving; Renewable Energies; Information Provision.

If other(s), please specify

Concerning a national strategy or plan to mitigate energy poverty, **9 out of 14 countries do not have a national strategy or plan to mitigate energy poverty in their country**, as presented in the Table 7 and Figure 3.

Table 7: National strategy or plan to mitigate energy poverty

Country	Is there a national strategy or plan to mitigate energy poverty?	
	Yes	No
Portugal	X	
Netherlands		X
Italy		X
Spain	X	
Sweden		X
UK	X	
Bulgaria		X
France	X	
Austria		X
Greece	X	
Croatia		X
Luxembourg		X
Slovakia		X
Lithuania		X

Countries with a national strategy such as **Greece**, in the National Strategy for Energy Poverty Alleviation proposes that a household is considered to fall into energy poverty area, where both following conditions are met its total annual energy cost is less than 60% of the cost of its minimum energy requirements and, its net annual income is less than 60% of the national median.

Countries without national strategy such as the **Luxembourg** and **Netherlands** mentioned that they do not have a responsible authority for tackling energy poverty, in the case of Luxembourg, and do not have a national strategy, in the case of the Netherlands, it is something that they are current working on.

Countries that have introduced a national strategy and plan (Table 7, Figure 3), have done so starting from a definition of the problem and monitoring indicators. This is a critical step, as the current energy crisis will likely increase the population in energy poverty and its impact.

Figure 3: National strategy/plan per country

The policies to fight energy poverty should encompass a process of public participation, with broad stakeholder involvement. The definition of the measures to combat energy poverty must be based on close cooperation between all levels of public administration, regional and local authorities, as well as civil society organizations and private sector entities, as these stakeholders are often already dealing with the impacts of energy poverty and might offer valuable insights.

At the same time, these strategies should be in line with national Long-Term Renovation Strategies (and the future Building Renovation Plans) to make sure the obstacles to invest in energy efficiency in the homes are removed for the energy poor households and that the housing stock with the greatest need for renovation is targeted.

In all the countries with a formal plan or strategy, these plans include measures related with **information provision, renewable energies, energy saving, financial intervention and consumer protection** (Table 8).

Table 8: Types of energy poverty measures per country

Country	Consumer Protection	Financial Intervention	Energy Saving	Renewable Energies	Information Provision
Portugal	X	X	X	X	X
Spain	X	X	X	X	X
UK	X	X	X	X	X
France					
Greece	X	X	X	X	X

Concerning general energy poverty policies,**10 out of 14 countries have activities/programs already implemented to mitigate energy poverty in their country** (Table 9).

Table 9: Activities/programmes implemented or in plannning

Country	Are there activities/programmes already implemented or being defined in the different areas?	
	Yes	No
Portugal	X	
Netherlands		X
Italy	X	
Spain	X	
Sweden		X
UK	X	
Bulgaria	X	
France	X	
Austria		X
Greece	X	
Croatia	X	
Luxembourg	X	
Slovakia		X
Lithuania	X	

The types of energy poverty fighting measures implemented in most of the plans or strategies are consumer protection, financial intervention, energy saving, renewable energies, and information provision, **with a highlight on energy saving** (Figure 4).

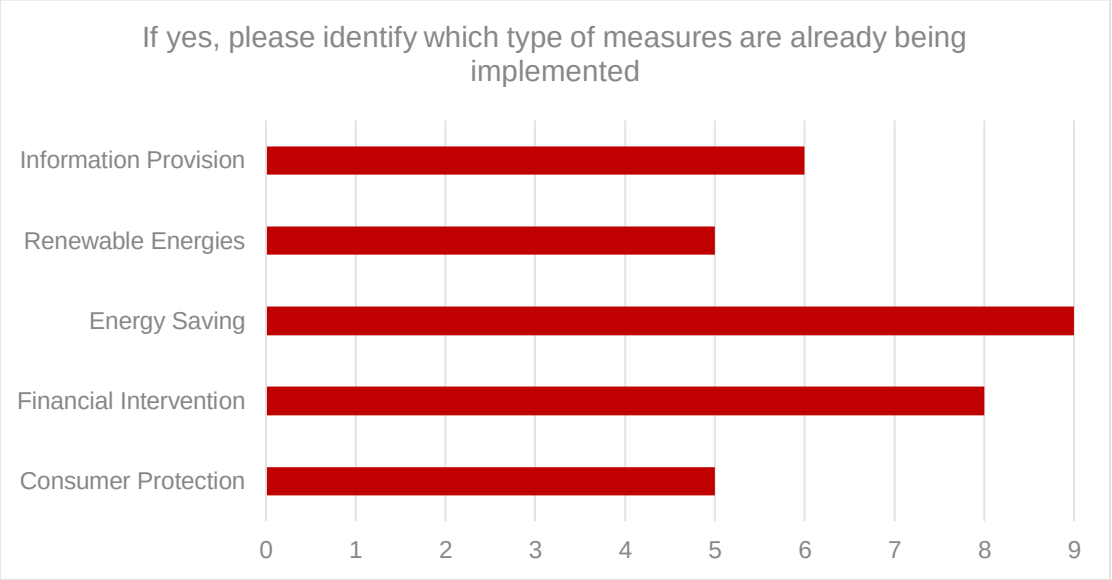


Figure 4: Energy poverty measures under implementation
(Number of countries implementing each typology of measures, out of the 9 which responded)

In the countries with a national strategy or energy poverty plan, EnR agencies identified and rated barriers to implement it (on a scale of 1 to 5, where 5 represents the most relevant barriers, 1 the less important ones; 0 means that the question was not answered). The main barriers identified were the **identification of energy poor households**, followed by **investment from the families** (Table 10, Figure 5).

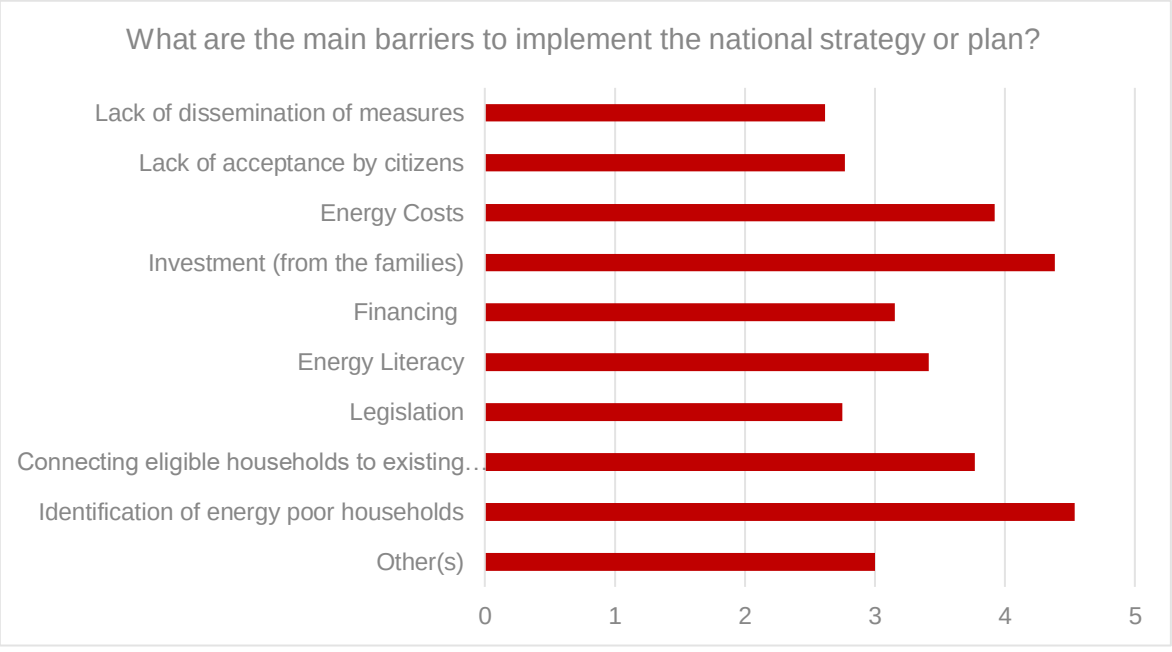


Figure 5: Main barriers to implement the national strategy or plan
(Average score, on a scale of 1 to 5, where 5 represents the most relevant barriers, 1 the less important ones.)

Table 10: Main barriers to implement the national strategy or energy poverty plan per country

Country	Identification of energy poor households	Connecting eligible households to existing programmes	Legislation	Energy Literacy	Financing	Investment (from the families)	Energy Costs	Lack of acceptance by citizens	Lack of dissemination of measures	Other(s)
Portugal	5	5	3	4	3	4	4	5	5	0
Netherlands	5	5	3	3	2	5	5	3	1	5
Italy	5	1	1	3	3	4	4	1	2	0
Spain	5	4	3	4	3	5	5	3	4	0
Sweden	0	0	0	0	0	0	0	0	0	0
UK	4	3	1	1	3	2	1	1	1	3
Bulgaria	5	4	4	3	4	5	5	3	3	0
France	5	5	2	0	4	4	4	2	3	0
Austria	5	4	2	4	3	5	1	3	3	0
Greece	4	2	0	4	4	5	5	1	1	0
Croatia	3	4	1	2	3	5	3	3	2	0
Luxembourg	4	4	4	4	2	4	4	2	3	1
Slovakia	5	4	5	4	4	4	5	5	3	0
Lithuania	4	4	4	5	3	5	5	4	3	0

Energy poverty mitigation requires being able to target vulnerable consumers and ensure that the resources to protect the energy poor households are directed to the corrects instruments. A new sustainable energy model should include a comprehensive response to energy poverty with a regular evaluation of the strategy planned.

To guarantee the effective right for all citizens to access energy at an affordable cost, it is necessary to have the indicators that better describe the reality of the consumer in energy poverty with particular reference to vulnerable and excluded groups.

A national strategy should diagnose and describe the energy poverty in a country, develop follow-up indicators, monitoring strategies, establish medium and long-term energy poverty reduction goals at national, regional and local levels, and propose specific measures to achieve these goals, as well as forms of financing to mitigate this problem in the coming years.

4.4 Funding and financing

The survey covered the issue of funding and financing for energy poverty mitigation investments, asking EnR agencies for the existing subsidies, loans, tariff schemes, tax breaks and direct public investment. This information would allow an analysis of social and infrastructural aspects and to develop possible action in the short and medium-term. Full answers from each individual country are provided in Annex 2 and a summary is provided in Table 11.

Questions:

What funding and financing sources exist for energy poverty mitigation?

EnR agencies countries identified existing funding and financing sources, choosing between subsidies, loans, tariff schemes, tax breaks, or direct public investment. Some countries identified specificities such as **UK** that has 100% funding of energy efficiency/certain renewable technologies. Under the 'Tax Breaks' option UK Government has removed VAT from energy saving measures including renewables. However, this VAT break is only available in England, Scotland and Wales, and not in Northern Ireland. In **Luxembourg**, the social welfare office may cover energy bills of households not able to pay. There are also subsidy schemes for refurbishment, renewable energy systems, electric mobility, household appliances. And policies such as free public transport and direct / general subsidy for households with low income, also contribute to mitigate energy poverty.

Table 11:Available funding and financing sources for energy poverty mitigation

Country	Subsidies	Loans	Tariff schemes	Tax breaks	Direct public investment
Portugal	X	X	X		X
Netherlands	X			X	
Italy			X		
Spain	X	X	X	X	X
Sweden					
UK	X	X			X
Bulgaria					X
France	X	X	X	X	X
Austria					
Greece	X		X		
Croatia					
Luxembourg	X	X	X		
Slovakia					X
Lithuania					

Subsidies, **direct public investment** and **tariff schemes** are two of the most widely implemented sources of funding and financing for energy poverty mitigation. Subsidies are direct public funds from governments to support energy access and efficiency programs and initiatives, while tariff schemes introduce a positive bias through the pricing and are especially helpful for immediate reduction of the cost of energy access for lower-income households.

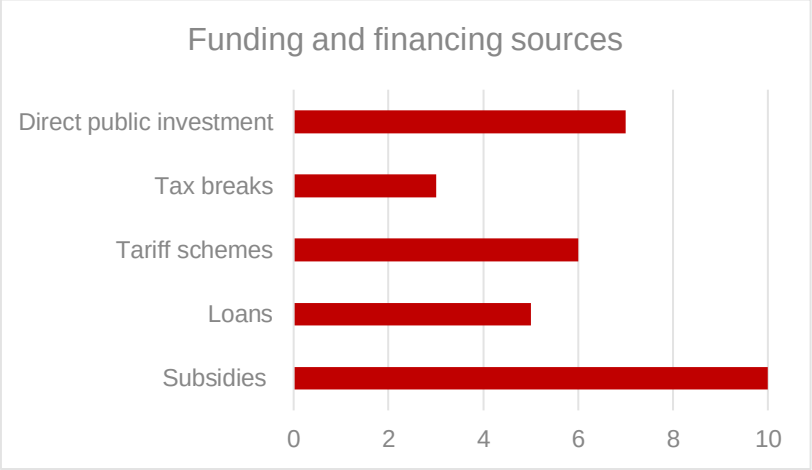


Figure 6: Funding and financing sources
(Number of countries with each funding and financing mechanism available, out of the 10 which responded)

4.5 Renewable Energy Communities and Energy Poverty

Supporting the creation of Renewable Energy Communities may simultaneously provide benefits regarding energy poverty alleviation, as well as contribute to meet targets under the Paris Agreement and thus reduce the dependence on fossil fuels, and increasing access to affordable clean electricity.

Renewable Energy Communities should be promoted with integrated, participatory and neighborhood-based approaches. This creates green jobs and various social and economic benefits that stay at the local level with an impact on energy poverty households and promotes active citizen participation in the energy system as prosumers.

The survey addressed the implementation of Renewable Energy Communities to mitigate energy poverty, collecting information about the solutions and stakeholders involved.

Question:

> *In your country, are there projects implemented or being designed to mitigate energy poverty that includes renewable energy communities (REC)?*
>
> *If yes, please indicate the main cluster of REC being used for energy poverty mitigation: Agriculture, Industry, Residential, Services (including public administration buildings and equipment's such as schools, etc.). If hybrid, please specify:*

Regarding the projects implemented or being designed to mitigate energy poverty that include renewable energy communities (REC), **7 out of 14 countries have REC projects involving energy poverty mitigation** (Table 12, Figure 7).

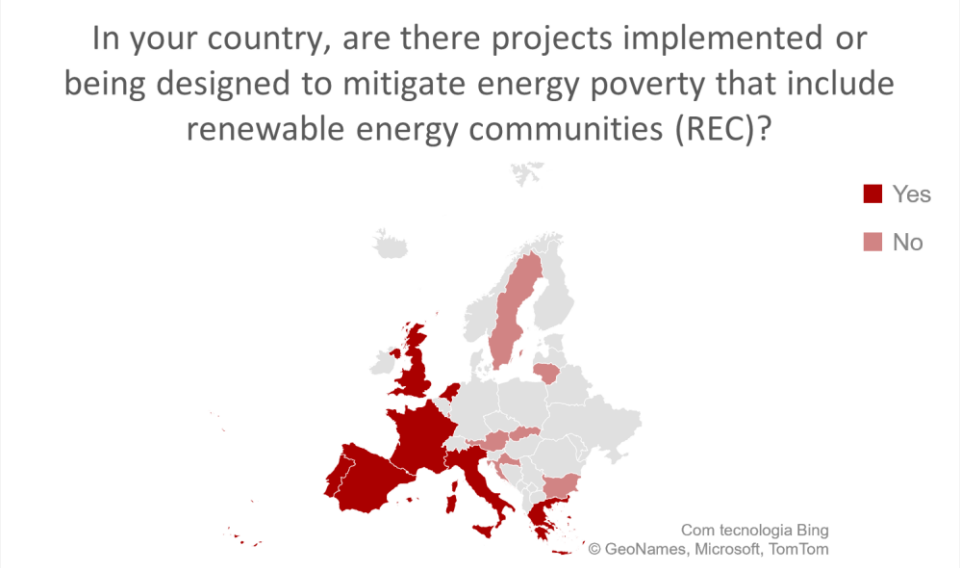


Figure 7: Existence of projects (implemented or planned) to mitigate energy poverty which include Renewable Energy Communities (REC)

Table 12: Existence of projects (implemented or planned) to mitigate energy poverty which include Renewable Energy Communities (REC**)**

Country	In your country, are there projects implemented or being designed to mitigate energy poverty that includes renewable energy communities (REC)?	
	Yes	No
Portugal	X	
Netherlands	X	
Italy	X	
Spain	X	
Sweden		X
UK	X	
Bulgaria		X
France	X	
Austria		X
Greece	X	
Croatia		X
Luxembourg		X
Slovakia		X
Lithuania		X

The main cluster of Renewable Energy Communities being used to mitigate energy poverty is **residential** (Table 13).

Table 13: Main cluster of REC being used for energy poverty mitigation

Country	Residential	Services	Hybrid
Portugal	X		
Netherlands	X		
Italy	X		
Spain	X	X	X
UK	X		
France			
Greece		X	X

Question:

> *If yes, please give a brief description of the most important/relevant adopted solution, stakeholders and other relevant information that better describe the implemented system*

In **Portugal**, the Porto Energy ElevatoR European project, within the scope of Horizon 2020, sought by the Porto Energy Agency, aims to fight energy poverty and promote energy efficiency in 3,000 buildings and encourage individuals to participate in Renewable Energy Communities, with the installation of 12MW from renewable sources.

In **Netherlands**, municipalities work with local energy communities and some of them engage these communities in alleviating energy poverty. Usually in combination with one of the subsidy schemes.

In **Spain**, the CE IMPLEMENTA program is an initiative, promoted by the MITERD through the IDAE within the Spanish Recovery Plan, whose objective is to promote social innovation and citizen participation in renewable energies, energy efficiency or electric mobility through the execution of 40 projects promoted by renewable energy communities. The project proposals foresee different financing solutions such as those based on crowdfunding systems. Likewise, in the case of collective self-consumption, there are interesting proposals in which the participants buy shares in the collective self-consumption facilities that generate savings on their electricity bill. Currently, at the national level there are different projects related to energy communities.

In **UK**, Community and Renewable Energy Scheme (CARES) runs in Scotland helping communities with free advice and support to develop renewable energy schemes or to secure and manage income from renewables, advice on funding streams and support to access CARES funding. We are Local Energy Scotland · Local Energy Scotland, funded by the Scottish Government that is managed by a consortium of Energy Saving Trust and regional energy agencies. The case studies presented in the Annex it is from Local Energy Scotland.

In **Greece**, REC using smart metering schemes may provide a part of RES produced electricity to energy poor household and vulnerable consumers.

Question:

> *In addition to lower energy price access due to the introduction of renewable energies, are there other benefits that those families can get from being part of a Renewable Energy Community? [Social/Employment, Health, Economical (beyond price, e.g. service sharing?), Thermal Comfort. If other(s). Please specify.]*

When Renewable Energy Communities projects are specifically designed to mitigate energy poverty, they can not only reduce electricity bill for vulnerable households, but also present the opportunity to provide advice and support vulnerable households in other ways. REC have the power to promote

social innovation, citizen participation in renewable energies, energy efficiency and electrical mobility.

Most of the EnR member agencies that responded (**5 out of 7**) referred additional benefits for households from membership in Renewable Energy Communities, in addition to lower energy prices (Table 14, countries not displayed did not answer the question).

Table 14: Existence of additional benefits for households from membership in a Renewable Energy Community

Country	In addition to lower energy price access due to the introduction of renewable energies, are there other benefits that those families can get from being part of a Renewable Energy Community?
Portugal	Yes
Netherlands	Yes
Italy	Yes
Spain	Yes
UK	Yes
France	No
Greece	No

The main additional benefit from being part of a Renewable Energy Community in the context of energy poverty mitigation is **thermal comfort** (Table 15).

Table 15: Type of additional benefits for households from membership in a Renewable Energy Community

Country	Social/ Employment	Health	Economical (beyond price, e.g. service sharing)	Thermal Comfort	Other(s)	Other(s)
Portugal	1	1	1	5	0	
Netherlands	2	3	2	5	0	
Italy	1	3	3	3	0	
Spain	4	3	3	4	5	See Annex 2, Q29.
UK	3	3	3	3	3	See Annex 2, Q29.

4.5 Role of the Energy Agencies

Energy Agencies are quite distinct between countries regarding their roles. They might have varying degrees of responsibilities over matters related with supply and use of energy, providing analysis, data, policy recommendations. But all energy agencies are at the forefront of the transition to a sustainable energy system. To meet the challenges of decarbonization, energy agencies can provide support to citizens, contributing to behavior change; and to local authorities, creating a facilitating environment and organizational change in mindset. Regarding energy agencies' role in energy poverty mitigation strategies, the survey covered their roles and responsibilities.

Question:

Did the energy agency participate in the design of the national strategy or plan?

If yes, please describe briefly the type of support from the energy agencies in the design of the national strategy (technical support, indicators, other).

*If applicable, in the implementation of this strategy/plan, what is the role of EnR member agency? [*Policy design, technical support for policy design, management (financial, strategic), operationalization (technical), promotion/dissemination, contact center activities, indicators (Business Intelligence Solutions), If other(s), please specify]

Regarding the energy agency's participation in the design of the national strategy or plan to mitigate energy poverty, **10 out of 14 agencies state they have participated in the design of the national strategy or plan to mitigate energy poverty** (Figure 8).

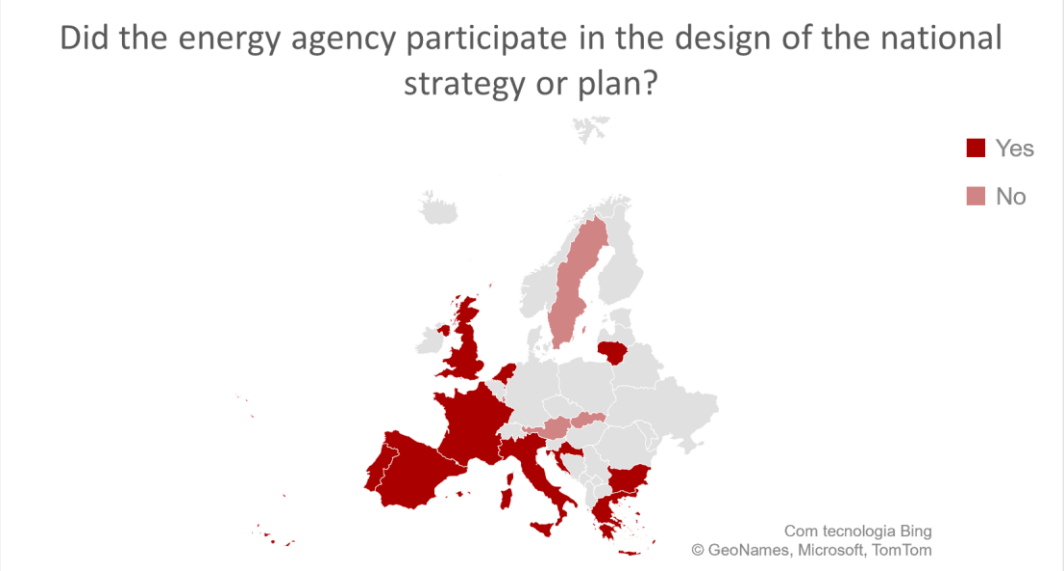


Figure 8 -- Energy agency participation in the design of the national strategy or plan

Most of the EnR agencies' provided **technical support for policy design and promotion/dissemination** in the implementation of strategy/plan to mitigate energy poverty, as well as providing **monitoring solutions** with indicator progress.

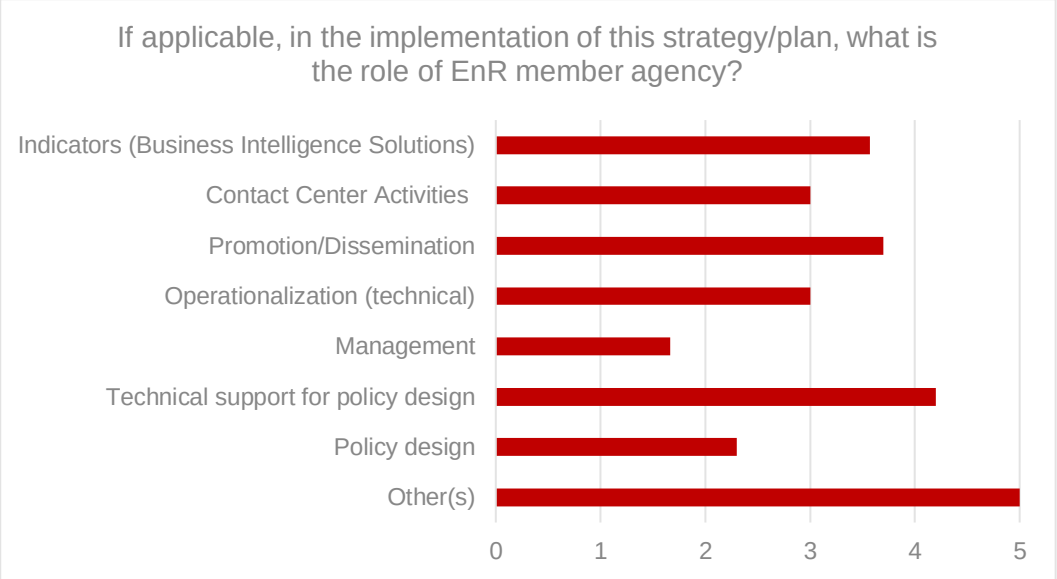


Figure 9- Role of the energy agencies
(Average score, on a scale of 1 to 5, where 5 represents the most relevant roles, 1 the less important ones.)

In **Portugal**, ADENE provided technical support to the drafting of the National Long-Term Strategy to Fight Energy Poverty 2021-2050 that currently is in the stage of public consultation.

In **Netherlands**, the energy agency is a partner in the setting up of a strategy together with the ministry of Economic Affairs and Climate.

In **Italy**, ENEA provided technical support, and monitoring.

In **Spain**, IDAE plays an active role in the measures established to improve the knowledge about energy poverty and transparency of information, among which are the publication of an annual monitoring report updating the four main official indicators based on national data, analyzing the trends and comparing with the EU Member States, and the development of an study aimed to the assessment of the energy expenditure needs of homes to meet the required thermal comfort of the dwellings. IDAE is responsible for the development of a three-year project (2022-2025), monitoring a panel of 400 vulnerable households, to support better design of the existing support measures.

In **UK**, for all nations i.e. England, Scotland, Wales and Northern Ireland the energy agency (Energy Saving Trust, EST) provides input via consultations, particularly on good practice in advice provision. In Scotland, EST also fed insight from their advice network into the design of the fuel poverty funding programme. EST provides advice, which is much more than 'contact' center' in Scotland, Wales; Partner engagement in Scotland, Wales, Northern Ireland; provision of in-home advice and support in Scotland.

In **Bulgaria**, SEDA is a member of the Interinstitutional Working Group which was assigned in April 2022 with the task to develop official definition for “energy poverty”.

In **France**, ADEME is chairing the National Observatory (ONPE) that provides important background elements. And ADEME also produces various studies that support the design and improvement of the policies and programmes. ADEME is leading the work on promotion/dissemination, local energy advice centers and indicators.

In **Greece**, the National Strategy for Energy Poverty Alleviation was developed by CRES, mandated by the Greek Ministry of Energy & Climate Change. The National Action Plan foresees that CRES will operate the ‘National Observatory for Energy Poverty’ aiming at monitoring energy poverty data and policies.

In **Croatia**, the energy agency EIHP provided technical support to the competent authority responsible for adoption of a national plan.

In **Lithuania**, the energy agency ENA is responsible for the assessment of measures, and for modeling of energy consumption.

Questions:

> *Does the energy agency have a department/area responsible for energy poverty or is it being created/defined?*
>
> *If yes, please describe briefly the main project(s) you are currently working on.*

Regarding the governance structure inside energy agencies to deal with energy poverty, **6 out of 14 energy agencies do not have a specific department/area responsible for energy poverty**.

In **Portugal**, ADENE is tasked by the national government to provide technical support, promote and develop indicators for the Efficiency Voucher program (*Vale Eficiência*), that finances energy efficiency building measures as well as the installation of photovoltaic panels and other equipment for the production of renewable energy for self-consumption in energy-poor households. The allocation of the 1st phase of the “*Vale Eficiência*” program is €31,980,000 converted into the delivery of 20,000 vouchers, in the amount of €1,300 plus VAT each voucher (total program has 162 million euros to distribute to 100,000 families until 2025). The Energy Save (*Poupa Energia*) is an ADENE platform for simulating and comparing electricity and natural gas tariffs, which allows consumers to make an informed choice in their energy contracts. Furthermore, there are several articles and content dedicated to energy poverty consumers.

In **Italy**, H2020/Erasmus+ Projects: Involvement of the Third Sector in contrasting Energy Poverty (SER and GREENABILITY) and Removing split-incentives barriers to energy retrofitting in the residential rental sector (ENPOR).

In **Spain**, inside IDAE there is not a department specifically in charge of the energy poverty. However, the IDAE is responsible for the development of a three-year project for monitoring of energy poverty in Spain, considering the existing winter climate zones available in Spain in accordance with the Technical Building Code (monitoring 400 families over 3 years). This project, which is framed in the Strategy against Energy Poverty, 2019-2024, (ENPE), will started in June 2022.

In **France**, there is no ad-hoc department or service on energy poverty within ADEME, but two full time experts dedicated to energy poverty and ONPE, and other ADEME staff contributing to ONPE and activities on energy poverty as part of their missions, so in total 8 persons contribute to this field.

In **Austria**, AEA is currently involved in ENPOR, an H2020 project to support energy poor households in the private rental sector. Concerning the target region of Vienna, it is implementing the development of new target group-oriented information and advisory materials on energy topics together with an energy advisory service for energy poor households. In contrast to current material, it contains little text and focus on clear communication with the help of illustrations. This is intended to provide important added value for advice for and communication with energy poor households. Furthermore, AEA is also working in a national project on the development of material on mobility topics for the consultation of energy poor households, as mobility is usually an unaddressed topic. This is intended to create a basis for raising awareness among affected households on related topics and issues as well. AEA provides input on the topic to the responsible Ministry, which has become very relevant due to current developments.

In **Greece**, CRES develops actions to Mitigate Energy Poverty in the Private Rented Sector (PRS), and is involved in the EU-funded ENPOR project, which aims to render energy poverty in PRS more detectable and measurable. This will assist in addressing it. The project will consider dedicated actions to identify energy-poor tenants and their respective homeowners and to comprehend their specific challenges (energy efficiency, structural problems like information deficits, split incentives and others).

In **Luxembourg**, Klima Agence is involved in the implementation of a project procuring energy advice to low income households, combined to an electric appliance's subsidy scheme.

4.6 Emergency measures

Governments across Europe and in key non-member economies have rolled out significant support to shield households and firms from the impacts of high energy prices that followed the strong recovery in demand in the aftermath of the COVID-19 slump and the fallout of the war in Ukraine [2].

In this survey, EnR collected information on special emergency measures put in place to deal with the energy crisis, which might help reduce its impact on the increase in energy poverty that could closely follow rising prices.

Questions

> *Are there special measures to mitigate rising energy prices, taking into account the current new framework (COVID-19, war in Ukraine, and consecutive increases in energy prices)?*
>
> *If yes please describe special measures adopted.*

Concerning the special measures to mitigate rising energy prices, considering the current new framework (COVID-19, war in Ukraine, and consecutive increases in energy prices), **all countries** answered that they **have a special measure to attend the current framework.** The COVID-19 and war in Ukraine showed the need to rethink energy security and resilience as a key priority. The future requires strategic decision-making by governments and institutions to be more resilient to unstable scenarios. Increasing energy poverty was one of the main problems that the several recent crises have triggered and should therefore be a main priority in the policy responses to the new framework.

Full answers from individual countries provided in Annex 2 (Questions 36 and 37 for induvial countries).

In **Portugal**, The AUTOvoucher is a financial support created by the Portuguese government in order to help consumers face the significant increase in fuel prices. To join the program, the citizen must register, free of charge, on a platform. After that, automatically, all purchases at adherent fuel pumps paid for with a credit or debit card registered to the same tax number gets an immediate (within two business days) cash back refund deposited into the bank account. The discount is granted per consumer, which means that in the same family there can be several consumers benefiting from the refund. The AUTOvoucher measure was discontinued in May 2022 and replaced by a permanent reduction in the oil, gas and energy products tax, which can be reviewed as needed to accommodate fluctuations in international markets. The possibility of a temporary VAT rate reduction is also under discussion with the EU.

In **Netherlands**, Ad hoc financial support for households.

In **Italy**, Reinforcement of Energy Social Bonus.

In **Spain**, the government approved several measures to assist the electricity sector and consumers among which the Royal Decree-Law 11/2020, of 31 March, stands out, which adopted urgent social and economic measures to deal with COVID-19, included the following measures related to the electricity sector and electricity consumers. The supply guarantee measures such as prohibition to interrupt the supplies (electricity, natural gas, and water) to consumers, new category of vulnerable consumers (self-employed workers affected by the closure measures of establishments that meet certain income requirements), suspension of bills (electricity, natural gas, and petroleum products) applicable only to SMEs, allowing the option to temporarily suspend bills for electricity and natural gas consumption for a period of six months following the end of the state of emergency due to COVID-19. Subsequently, to alleviate the effect of the rise in energy prices, additional measures have been adopted, temporary suspension, during the last two quarters of 2021 and the first quarter of 2022, of the tax on the value of electricity production, limitation for 3 quarters (from October 2021 to July 2022) on the increase in the cost of raw materials (maximum limit of 15%) included in the last resort rate for natural gas applied to domestic consumers, to cushion the effect of the exceptional rise in international natural gas prices. Establishment of a minimum vital supply for vulnerable consumers, improvement of the protection of the beneficiaries of the thermal social bonus, increase in discounts for the electricity social bonus (up to 70% for severely vulnerable consumers and up to 60% for vulnerable consumers), support mechanism to guarantee the competitiveness of the electro intensive industry (from January 1 to December 31, 2022), 80% reduction in the electricity bill of the cost corresponding to access tolls to the electricity transmission and distribution networks. Support measures for the intensive gas industry in 2022 through a line of direct aid of €125 million to alleviate the detrimental effect of the increase in the cost of gas caused by the invasion of Ukraine and the sanctions imposed on Russia Reduction of electricity system charges. Temporary mechanism for adjusting production costs to reduce the electricity price in the wholesale market which contributes to limit the impact of the rise in natural gas prices. The adjustment mechanism is adopted simultaneously in the Iberian Peninsula due to the integration of the Spanish and Portuguese electricity markets in the Iberian Electricity Market, MIBEL. The value of the adjustment to the marginal fossil plants is established as the difference between a reference price of gas, and the daily effective price of the natural gas spot market. The reference price will start at a value of €40/MWh during the first six months and will increase in successive monthly steps of €5/MWh until reaching a value of €70/MWh in the last month.

In **Sweden**, has the short term state support to households with electricity consumption between 700 and 2,000 KWh per month for the period December 2021 to February 2022 and between 400 and 2000 kWh in March 2022. (Also, a suggestion has been made by the government to make 1000-1500 SEK cash transfer to the families which own cars. The higher amount applies for rural areas. Furthermore, a suggestion was made for a temporary reduction of petrol and diesel taxes for the period of June -October 2022. These measures have however not yet been adopted)

In **UK**, announced on 26 May 2022 covering England, Scotland and Wales with this or equivalent support to people in Northern Ireland, measures such as energy bills support scheme doubled to a one-off £400 made as a grant, via energy suppliers, £650 one-off Cost of Living Payment for those on means tested benefits made in two lump sums directly by the government – tax free and will make no impact on existing benefit payments, one-off £300 Pensioner Cost of Living Payment paid directly to pensioner households by the government, £150 Disability Cost of Living Payment – an additional payment made directly by the government to those on disability benefits – tax free and will make no impact on existing benefit payments. Also announced on 26 May 2022, £500million across UK to increase and extend the Household Support Fund which helps those in most need with payments towards the rising cost of food, energy and water bills. This is administered differently and called different names in the different nations ie. England, Scotland, Wales and Northern Ireland. In England it is administered by local councils. In Scotland from April 2022 the additional £10 million into the Fuel Insecurity Fund to help households at risk of self-disconnection, or self-rationing their energy use, due to unaffordable fuel costs. Expansion of the Home Energy Scotland (HES) advice service, which provides free, impartial advice available to all households in Scotland on making homes warmer, greener and easier to heat. Widening the eligibility criteria of the Scottish Government's flagship Warmer Homes Scotland fuel poverty programme to include more groups within the 60 – 75 years age range. Increasing the level of funding individual fuel poor households could benefit from through the local authority-led Area Based Schemes. In Wales on 14 February 2022, the government announced the following expansion of its measures are £150 cost-of-living payment to all households who live in properties in council tax bands, £25 million discretionary fund for local authorities, allowing councils to use their local knowledge to help households who may be struggling. More than £100 million (in 2022-23) to strengthen other schemes that help people meet the rising costs of living. More money will be provided through the Discretionary Assistance Fund (this fund helps people pay for essential costs such as food, gas, electricity, clothing or emergency travel) and through the Winter Fuel Support Scheme (enables households to claim a one-off payment of £200 to provide support towards paying winter fuel bills).

In **Bulgaria**, in the Recovery and Resilience Plan there are two investments directly targeted to vulnerable households – energy efficiency in buildings and grant scheme for solar and PV installations for households.

In **France**, the tariff umbrella freezes of the gas sales regulated tariff and limitation of the electricity regulated tariff rise to 4% + special increase (about doubling) of the energy voucher.

In **Austria**, several financial supports for households were introduced to relieve them from the rising energy prices. While the measures also benefit energy poor households, they are not tailored to them specifically through an energy cost offset, each household can apply for 150 euros of assistance, which will be deducted from the annual energy bill. The green electricity subsidy (levy in electricity costs) has been suspended for the year 2022. Electricity and gas tax have been

temporarily reduced by 90%. Through an inflation compensation, socially vulnerable households can receive a further 300 euros in support for this year. Through a so-called climate bonus, all households will also receive 500 euros per person (250 for children) in the household as support this year. This was originally intended as a relief measure for the introduction of a CO2 price. However, due to the current situation, the introduction of the price was postponed, and the support increased.

In **Greece**, national subsidy on excess Electricity & Fuel prices for most households (Power & Fuel Pass). Suspension of specific electricity market mechanisms for one year market prices control.

In **Croatia**, regulation of prices and vouchers for energy costs.

In **Luxembourg**, general measures, not only for low-income households such as reinforced subsidy schemes (general measure, not only for low-income households), temporary overtake of grid usage fee for natural gas for household clients. Temporary reduction of heating oil, gasoline and diesel prices, tax break (depending on income height). Specific measures and general subsidy for low-income households, social top-up on residential refurbishment and renewable energy systems.

In **Slovakia**, financing programs for energy efficiency and change of heating sources in households (RRF), change in legislation and several measures in consumers protection.

In **Lithuania**, Compensations for electricity and gas consumers.

5. Case studies overview

EnR agencies presented 16 case studies for analysis in this survey. The full description of the case studies is- presented in Annex 1 (full study and annexes are available at https://enr-network.org/energy-poverty-mitigation-in-europe-potential-role-for-renewable-energy-communities/).

The **geographical scope** of the case studies presented in this consultation launched by EnR was **national** (13), with only 3 local case studies were selected by national EnR agencies. Considering the implementation of renewable energies to mitigate energy poverty, **9 out of 16** case studies presented include renewable energies.

The main types of intervention in the case studies in the sample, are related to **energy saving** and **financial interventions**.

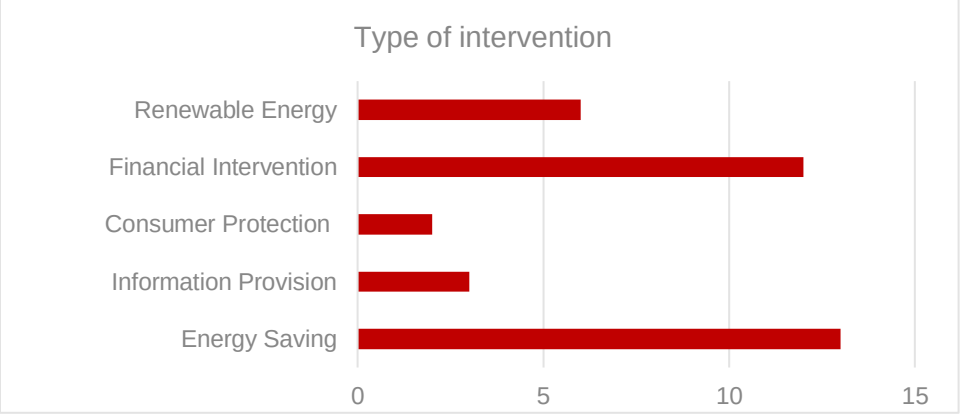


Figure 10- Type of intervention
(Number of case studies in which each typology is selected, out of the 16 case studies presented; Each case study may be characterized by a combination of interventions)

Financial interventions, introduced to support payment of bills, are primarily focused on short-term relief. But, for longer term benefits, it is essential to provide additional support to increase adoption of energy efficiency, targeting improvements to the building stock and energy efficient appliances. Also very relevant is the impact of behaviours on energy consumption reduction and efficiency in energy use. Therefore, the support for information and awareness raising programs should be highlighted, namely focusing on understanding of consumer rights, and information on market tariffs and energy-saving measures.

The main stakeholders that participate in the case studies presented are **central government** and **consumers**.

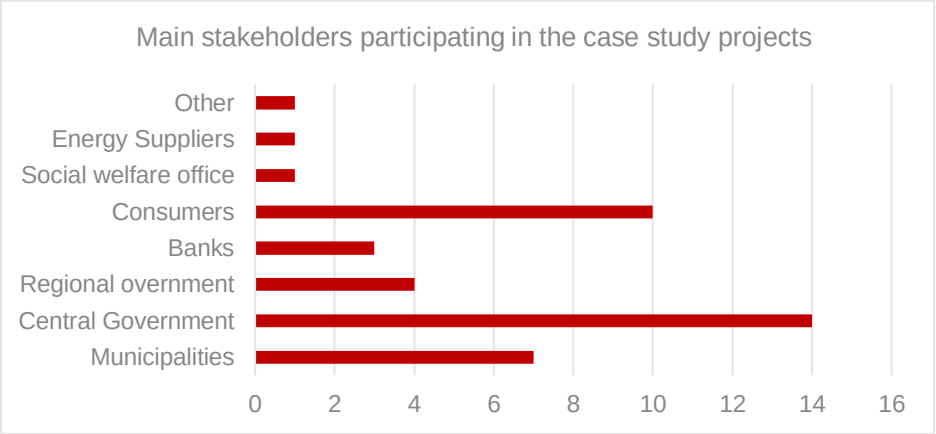


Figure 11- Main stakeholders that participate in the case study
(Number of case studies in which each typology is selected, out of the 16 case studies presented; Each case study may be characterized by a combination of stakeholders)

Public participation, by central governments or regional and local authorities, offers credibility to projects and helps overcome initial investment barriers. It can also have a triggering effect on the market, by providing security forr private investors and a project bundling and pipeline for larger financial institutions.

When analyzing implementation of these case studies, EnR agencies identified that the main success factors are related to the **dissemination of information** and **easy access to financial support or incentive**.

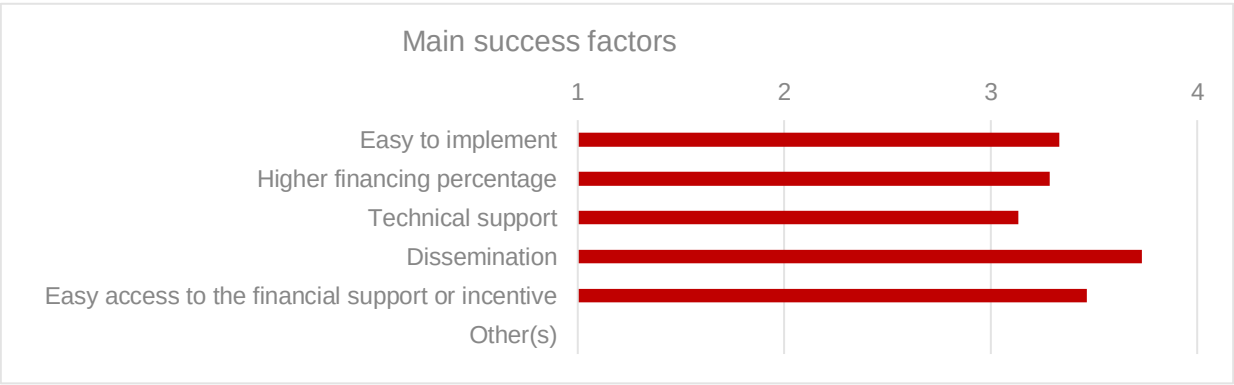


Figure 12 – Main success factors for implementation
(Average score, on a scale of 1 to 5, where 5 represents the most relevant factors, 1 the not relevant ones.)

The existence of an easy to access financial incentive is one of the most important factors to keep in mind when designing renewable energy projects, particularly targeting energy poverty. This also circles back to the existence of other support mechanisms, technical and bureaucratical, which can help address any difficulties in accessing existing financial incentives for the most vulnerable population, often also dealing with literacy issues (energy and digital).

The main barriers for implementation of the presented case studies are related to the **identification of energy poor households** and to the difficulty in **connecting eligible households to existing programmes**, closely followed by **difficult access to financial incentives**.

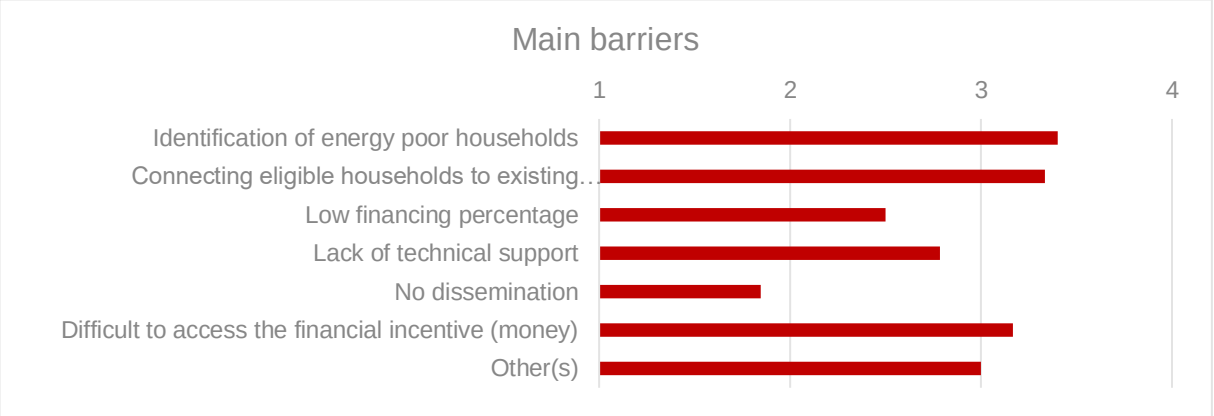


Figure 13 - Main barriers for implementation
(Average score, on a scale of 1 to 5, where 5 represents the most relevant factors, 1 the not relevant ones.)

These barriers related to engaging the right households and population must be addressed by better data collection and analysis, where EnR agencies can be of the utmost importance, but also in crossing the line from the energy professionals to the social professional, who have already gained the population's trust and often can much better assess multiple needs than exclusively the issues pertaining to energy.

As for the **role the members of EnR, national energy agencies**, play, they can assume varying degrees of intervention in diverse matters throughout the implementation of the case studies in this sample. The main roles of the EnR agencies are related to **promotion / dissemination**, **technical support for policy design**, and **policy design**.

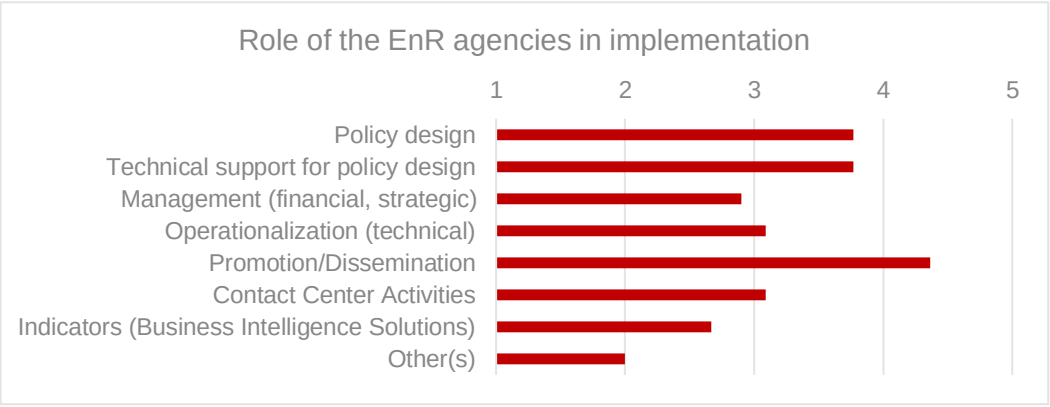


Figure 14- Role of the EnR Members in the implementation of the case studies
(Average score, on a scale of 1 to 5, where 5 represents the most relevant role, 1 the not relevant ones.)

Renewable energy projects, and specifically Renewable Energy Communities, offer as a primary and one of the main **benefits to households** the reduction in energy costs. Nevertheless, there can be **additional benefits** to renewable energy projects, in particular Renewable Energy Communities, for the efforts of mitigation of energy poverty, namely because a number of energy services can be offered by the community such as energy efficiency advice, retrofits and improvements, etc.

The main additional benefit for households in the sample of case studies analyzed, besides energy cost reduction, was **thermal comfort.**

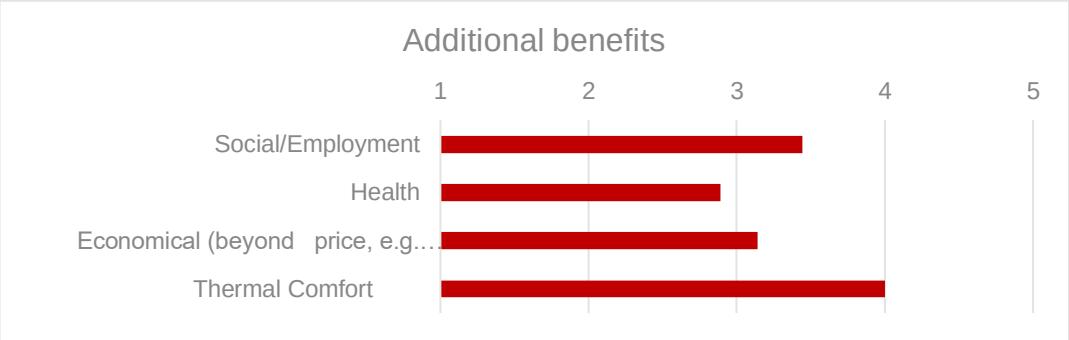


Figure 15- Additional benefits of the case studies, beside energy cost reduction
(Average score, on a scale of 1 to 5, where 5 represents the most relevant benefit, 1 the not relevant ones.)

The full description of the case studies is- presented in Annex 1 (full study and annexes are available at https://enr-network.org/energy-poverty-mitigation-in-europe-potential-role-for-renewable-energy-communities/).

6. Conclusions

Energy poverty is a growing problem in Europe that affects population health, household available income, and quality of life in general.

The framework of policies and action measures that can be adopted should be a cross cutting mix between social, technological, economic and cultural aspects pertaining to energy poverty. Generally, 4 different axis can be targeted:

Energy efficiency | Energy poverty is deeply connected with the housing stock conditions and with inefficient equipment. Therefore, improving the energy performance of housing in general (with actions and support mechanisms for structural renovations in rehabilitation of buildings, integration of renewable energies or planned equipment replacement) or incentives for changes in consumption patterns for the general population can assist the targeted energy poverty strategies.

Expenditure reductions | Inability to meet the costs of energy to adequately regulate thermal comfort in dwellings (both heating and cooling) is a major cause of energy poverty, not exclusive to socially vulnerable population. Mechanisms such as social tariffs, but also financial support for domestic consumers to avoid price-based exclusion of energy services, should be adopted. Generally, programs that address the challenges of the current energy and inflationary crisis, will also help alleviate energy poverty specifically. This contributes towards ensuring universal access to quality services at affordable prices. This also connects with the need to improve energy literacy and develop awareness-raising actions for correct energy use, as household energy efficiency/sufficiency is largely based on behaviour, impacting expenditures directly.

Consumer protection | In order to safeguard social cohesion, inability to meet rising energy costs should be targeted with specific protections for the more vulnerable consumers. This reinforces universal access to essential energy services, improving well-being and health of households facing energy poverty. At the same time, consumer protection measures can assist in the identification of energy poor households, allowing for further supporting actions, such as the development of self-consumption projects or engagement in Renewable Energy Communities.

Information and education | Promoting energy literacy in general is a key tool to assist in energy poverty alleviation. This can entail training and information campaigns to raise awareness for energy efficiency, encouraging behavior change to obtain both savings and improvements in comfort. It is essential to create or strengthen formal or informal advice and assistance structures, specifically at a local level, with greater proximity to the citizen, which can disseminate existing incentive schemes available to increase the energy efficiency of dwellings. Also, programs targeting schools about the importance of behavior change regarding efficient energy use should become universal and even part of the curricula.

6.1 Barriers and Opportunities

EnR member agencies in the study's Steering Committee discussed the study findings in two workshops, identifying barriers and potential solutions, presented in the tables below.

For social aspects related to energy poverty

Barriers/Challenges	Opportunities/Solutions
Very rapid energy price increases widen the population that is faced with energy poverty due to high prices/share of income spent on energy.	Create community solutions for thermal comfort: Warm rooms set up by municipalities that people can attend to avoid having to heat their house (activities), that could be power by renewable energies.
Difficult identification of the energy poor population Trust issues (in the grants, in the service companies' staff, etc.)	Use social, health professionals and public agents as a 1st contact point, to establish trust with the population for the energy auditors to come in (ex: health workers will have the trust of the elderly for health related renovations)

For Building Renovation

Barriers/Challenges	Opportunities/Solutions
Lack of specialized human resources to act as an intermediary	Provide sufficient resources for intermediaries as social work, public agents, and energy experts
Targeting energy poverty consumers with the correct deep renovations support mechanisms	Create an incentive to support the energy audit and energy certification for energy poverty households and designate them for future support mechanisms for deep renovations
Digital one-stop-shops are not accessible to all	Create actions for digital literacy training, ensuring everyone has an equal opportunity to participate
Lack of targeted support that is specific to energy poverty mitigation (broad programs make the direct identification of energy poor households hardly possible)	Access to pre renovation information (data collection), local agents and support to ensure benefits of renovations are being maximized and in is really aimed to energy poverty consumers
Energy poor households do not have the capacity to overcome initial investments	Develop support and incentive mechanisms (including non-refundable grants) to overcome the initial investments
Engage the right audience for construction training and education	Address supply chain skills gaps with the training, qualifications and technology solutions to tackle energy poverty
Lack of data at proper resolution	Promote smart building solutions, stimulating the creation of business models involving real estate agents and decision makers across the value chain to promote affordable smart buildings

For Energy Efficiency

Barriers/Challenges	Opportunities/Solutions
Engaging the energy poor	Training social workers and public agents to be energy efficiency promoters
Stimulate Energy Service Companies and Energy Performance Contracts for energy poverty households	Create public ESCOs to tackle energy poverty and increase visibility through social media campaigns
Create an easy access to relevant information/energy literacy	Development of educational programs, contents and actions adapted to different levels of education with educational tools and best practices exchange
Promote the support of energy efficiency in rented properties	Create support for social entrepreneurs that invest in communities to tackle energy poverty including in rented properties
Create systems for monitoring indicators and strategies	Promote the development of projects that monitor and manage solutions in real time Using smart meter data on displays used in homes to help awareness
Establish policies that prioritize the vulnerable population to access energy efficiency supports	Establish obligations in the programs that support energy efficiency measures for the energy poverty consumer (exclusive percentage and / or a priority in the program access)
Skepticism of beneficiaries on the advantages of energy efficiency	Setting up district companies (citizens living in the district) to directly help citizens with the efficiency measures or renovation, with energy coaches (ex: adjust settings of appliances).

For Renewable Energy Communities

Barriers/Challenges	Opportunities/Solutions
Rural/remote areas and islands are not as interesting for RES investments	Promote Renewable Energy Communities: promote and support projects on a local scale – “Sustainable Neighborhoods”, “Sustainable Villages” – with the aim of creating local dynamics with the involvement of communities and local agents
Grids are not prepared for decentralized energy production	Create smart grids; Reform the domestic energy supply market involving tech companies and research centers
Vulnerable population is less likely to access energy services, such as efficiency or other technical advice	Promote social inclusion within communities: Introduce the figure of the “Energy Doctor” in the community, acting on behavioral change and public awareness, involving the city council and parish councils
Access to renewable energy sources is not affordable, thus leaving vulnerable population excluded	Mobilize financial institutions in the creation of adequate mechanisms to create a framework of loans that allow extended access and simplified funding sources
Introduce a comprehensive Energy Poverty Strategy in line with Renewable Energy Communities	Implementation of market aggregators that can channel surplus renewable energy production for energy poverty households, including through Renewable Energy Communities

6.2 Recommendations

The main outcomes of the survey and case studies lead to recommendations of general measures such as **building renovation** and the promotion of **energy efficiency**, which could contribute to an overall energy consumption reduction, as well as to the reduction of the dependency on fossil fuels. A more targeted approach, on which this study focused, is the decentralized electricity production based on **Renewable Energy Communities**, for its potential high-impact role, both on fossil fuel dependency, and (more importantly for energy poverty mitigation) on long-term reduction of energy costs, increased energy services' access and energy efficiency measures. Considering the whole picture, it is divided the recommendations in different groups.

Guided by the study's findings, a set of recommendations is proposed, including aspects related to building renovation, energy efficiency and specifically regarding Renewable Energy Communities. Many of the solutions that can target energy poverty are common to a general framework of building stock conditions and energy efficiency improvement.

Building Renovation

I. Building Renovation

Support mechanisms for deep renovations | There is an important challenge associated with lack of financial capacity of energy poor households to overcome the initial investments required for deep renovations and improvements that benefit energy efficiency and alleviation of energy poverty. It is important to ensure coherent and consistent dialogue on energy poverty issues, also avoiding the fragmentation of funds that just partially support the renovations and don't consider the whole picture. The creation of support schemes to provide financing for multifamily apartment buildings' deep renovations should also involve technical support. This assistance might cover information provision, audits, consulting, installation of equipment, construction management, and the necessary budget management.

Construction training and education | As evidenced in the EnR study on Green Jobs & Skills, provide training for the construction industry workforce, including construction workers, project managers and designers, is critical to meet the energy transition targets, and therefore is also a critical aspect to mitigate energy poverty. Training should address retrofitting methods guided by sustainable practices. Greening the construction industry will also lead to the creation of a significant number of green jobs, while contributing to provide access to sustainable dwellings, especially for the population in energy poverty.

One-stop-shops | Facilitate access to information about technical and financial support for home owners, landlords and tenants, to foster building renovation.

Promote smart buildings | Encourage an inclusive approach in the access to the design and implementation of sustainable and intelligent building services. Smart buildings contribute to measuring and managing energy consumption and tackling energy poverty. There are benefits for operation & maintenance from the optimization these technologies provide, namely smart indoor comfort control. Measurements and control are key elements to move toward the alleviation of energy poverty.

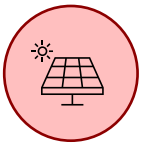
Energy Efficiency

II. Energy Efficiency

Energy Services Companies and Energy Performance Contracts | Explore the role of Energy Services Companies (ESCO) and Energy Performance Contracts (ESCO) in offering financing solutions for the renovation of homes for energy-poor families, so that they can overcome initial high costs. The support of the development of ESCO projects could also scale to regional and local energy agencies. The provision of a potential "public ESCO" player could provide greater confidence to the energy poverty citizens. The services could also cover all stages of the energy efficiency value chain, from energy audits to project design in line with the goals of energy-efficient buildings.

Access to relevant information and promote of energy literacy | Promote greater dissemination of knowledge in the energy area to contribute to energy literacy. The development of inclusive strategies assists in the actions to face info exclusion. Incentives through the promotion of field activities, offering all available information on energy tariffs, tax benefits, and energy efficiency support available on the market.

Support for energy efficiency in rented properties | Low-income households are often tenants and not homeowners, and it is essential to provide support mechanisms that aim to help vulnerable people and encourage energy efficiency in their homes. The involvement of the private rental sector in the design of policies and financing programs is important to guarantee that the most vulnerable population is not excluded from the support and programs that must be designed for them.



Renewable Energy Communities

III. Renewable energy communities

Introduce a comprehensive Energy Poverty Strategy in line with Renewable Energy Communities | Promote a long-term strategy to combat energy poverty developing instruments through renewable energies communities that benefit from the reduction of energy expenditure, energy prices, and access to quality services. It is fundamental to support the participation of vulnerable consumers in energy communities and in collective self-consumption as producers and as consumers.

Support establishment of not-for-profit citizen energy communities | Establish at the local level the creation of energy communities contributes to increasing public acceptance of renewable energy projects and makes it easier to attract private investments. Development of sustainable neighborhoods, eco-quarters involving municipalities to guarantee compliance with construction, energy standards and the integration of Renewable Energy Communities, specifically including energy poor consumers within the same geographical area.

Secure access to affordable renewable energies | Define objectives to ensure just and democratic access to affordable and clean energy is urgent. In addition to the effect towards fighting energy poverty, energy decentralization increases countries' energy independence.

7. References

[1] Bouzarovski, S. (2014). **Energy poverty in the European Union: Landscapes of vulnerability**. WENE, 3: 276-289 https://doi.org/10.1002/wene.89 [Accessed on 13/03/2023]

[2] OECD (2022). ***Why governments should target support amidst high energy prices***. *OECD Ukraine Hub website*, June 30, 2022. https://www.oecd.org/ukraine-hub/policy-responses/why-governments-should-target-support-amidst-high-energy-prices-40f44f78/ [Accessed on 13/03/2023]

[3] Gouveia J.P., Palma P., Bessa S., Mahoney K., Sequeira M. (2022). **Energy Poverty National Indicators: Insights for a more effective measuring**. *Energy Poverty Advisory Hub*. https://energy-poverty.ec.europa.eu/discover/publications/publications/energy-poverty-national-indicators-insights-more-effective-measuring_en [Accessed on 13/03/2023]

[4] Kyprianou I., Serghides D.K., Varo A., Gouveia J.P., Kopeva D., Murauskaite L. (2019), **Energy poverty policies and measures in 5 EU countries: A comparative study**, *Energy and Buildings*, Volume 196, 2019, Pages 46-60, ISSN 0378-7788, https://doi.org/10.1016/j.enbuild.2019.05.003 [Accessed on 13/03/2023]

[5] Caramizaru, E. and Uihlein, A. (2020), **Energy communities: an overview of energy and social innovation**, EUR 30083 EN, *Publications Office of the European Union*, Luxembourg, 2020, ISBN 978-92-76-10713-2, http://dx.doi.org/10.2760/180576, JRC119433. [Accessed on 13/03/2023]

[6] Hesselman M., Varo A., Guyet R., Thomson H. (2021) **Energy poverty in the COVID-19 era: Mapping global responses in light of momentum for the right to energy**, *Energy Research & Social Science*, Volume 81, 2021, 102246, ISSN 2214-6296, https://doi.org/10.1016/j.erss.2021.102246 [Accessed on 13/03/2023]

[7] Castaño-Rosa R., Solís-Guzmán J., Marrero M. (2020) **Energy poverty goes south? Understanding the costs of energy poverty with the index of vulnerable homes in Spain**, *Energy Research & Social Science*, Volume 60, 2020, 101325, ISSN 2214-6296, https://doi.org/10.1016/j.erss.2019.101325 [Accessed on 13/03/2023]

[8] Reis, I. F.G., Gonçalves, I., Lopes, M.A.R., Antunes, C.H. (2022) **Towards inclusive community-based energy markets: A multiagent framework**, *Applied Energy*, Elsevier, vol. 307(C). https://doi.org/10.1016/j.apenergy.2021.118115 [Accessed on 13/03/2023]

[9] European Energy Network (2022). **Comparative Study of the roles played by renewable energy network agencies in the implementation of public policies for building renovation and the main lessons learned.** *European Energy Network* https://enr-network.org/comparative-study-of-the-roles-played-by-renewable-energy-network-agencies-in-the-implementation-of-public-policies-for-building-renovation/ [Accessed on 13/03/2023]

[10] Portuguese Government (2021) *National Long Term Renovation Strategy.* Resolution of the Council of Ministers 8-A/2021, February 3rd. https://dre.pt/dre/detalhe/resolucao-conselho-ministros/8-a-2021-156295372 [Accessed on 13/03/2023]

[11] Portuguese Directorate-General for Energy and Geology (2021) *Proposal for a National Long Term Strategy to Combat Energy Poverty.* https://www.dgeg.gov.pt/pt/areas-transversais/relacoes-internacionais/politica-energetica/estrategia-nacional-de-longo-prazo-para-o-combate-a-pobreza-energetica/ [Accessed on 13/03/2023]