EnPover

# Toolkit of local support schemes facilitating implementation of energy efficiency measures in vulnerable households

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# INTRODUCTION

The present toolkit has been developed within the EnPover municipalities project in order to support cites in tackling energy poverty by giving practical **guidelines** and tips on assessing the scale of the problem on their territories, identifying most vulnerable households and planning concrete measures facilitaing implementation of low-cost and no-cost energy efficiency improvements in targeted households. It not only provides ready-to-use tools for tackling energy poverty on the local level, but also references to relevant and inspiring good practices and possible supporing material.

The EnPover municipalities project aimed at **alleviaing energy poverty** of vulnerable households by engaging municipal actors in the process. Private households are large contributors to the EU GHG emissions. At the same time they more and more often suffer from rising energy bills and are not being able to satisfy their daily energy needs. While larger energy renovations might not always be possible, **low-cost energy efficiency measures and change of behaviour** may be the answer to their problem. Introduction of such measures should be facilitated by the municipalities, who are the closest to their citizens and know best the challenges they face and their needs.

The project capacitated municipal actors to fight energy poverty on their territories and equipped them with a **set of universal and ready-to-use tools** boosting implementation of low-cost energy efficiency measures in households most prone to energy poverty. Also, a network of municipal professionals, exchanging relevant ideas and good practices, was created and a series of inspiring study visits was organised. And last, but not least, the project envisaged designing and implementation of model awareness raising campaigns that may inspire other cities to follow.

The project is financed from the European Climate Initiative (Contract number: 81247746) of the German Federal Ministry of the Environment, Nature Conservation and Nuclear Safety (BMU).

More information may be found at: www.enpover.eu

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# STEP 1

# Assessing energy poverty on the local level

# A. Energy poverty – an introduction to the problem

## What is energy poverty?

Broadly understood, the term energy poverty points to "a situation in which a household lacks a socially and materially necessitated level of energy services in the home".[1] While there are many ways domestic energy deprivation manifests, they often have the same root causes, including low household income, high prices of energy and energy inefficient homes.

In recent years energy poverty research and corresponding support schemes have been scaled up within the European Union. Despite this, throughout the EU, there are still millions of households that cannot satisfy their energy needs or satisfy them on the expense of other important expenditures, e.g. on food or health care. As the European Commission puts it, "energy poverty is a widespread problem across Europe, as between 50 and 125 million people are unable to afford proper indoor thermal comfort. A common European definition does not exist, but many Member States (MS) acknowledge the scale of this socio-economic situation and its negative impact translated into severe health issues and social isolation. Different terms are used to describe affected persons: fuel poor, energy poor, vulnerable energy consumers or, to a larger sense, at-risk-of-poverty or low-income people."[2]

Following BPIE, energy poverty can be illustrated by three main issues: (1) inability to keep homes adequately warm, (2) living in a dwelling with a leaking roof, rot windows and damp walls and (3) arrears on utility bills.[3]

1. Bouzarovski, S., Petrova, S., & Tirado-Herrero, S. (2014, January 1). *From Fuel Poverty to Energy Vulnerability: The Importance of Services, Needs and Practices.*
2. *Energy poverty.* (n.d.). Energy - European Commission. hps:// ec.europa.eu/energy/eu-buildings%20factsheets-topics-tree/energy-poverty_en
3. hps://www .bpie.eu/wp-content/uploads/2017/04/Factsheet_A-170420v4.compressed.pdf

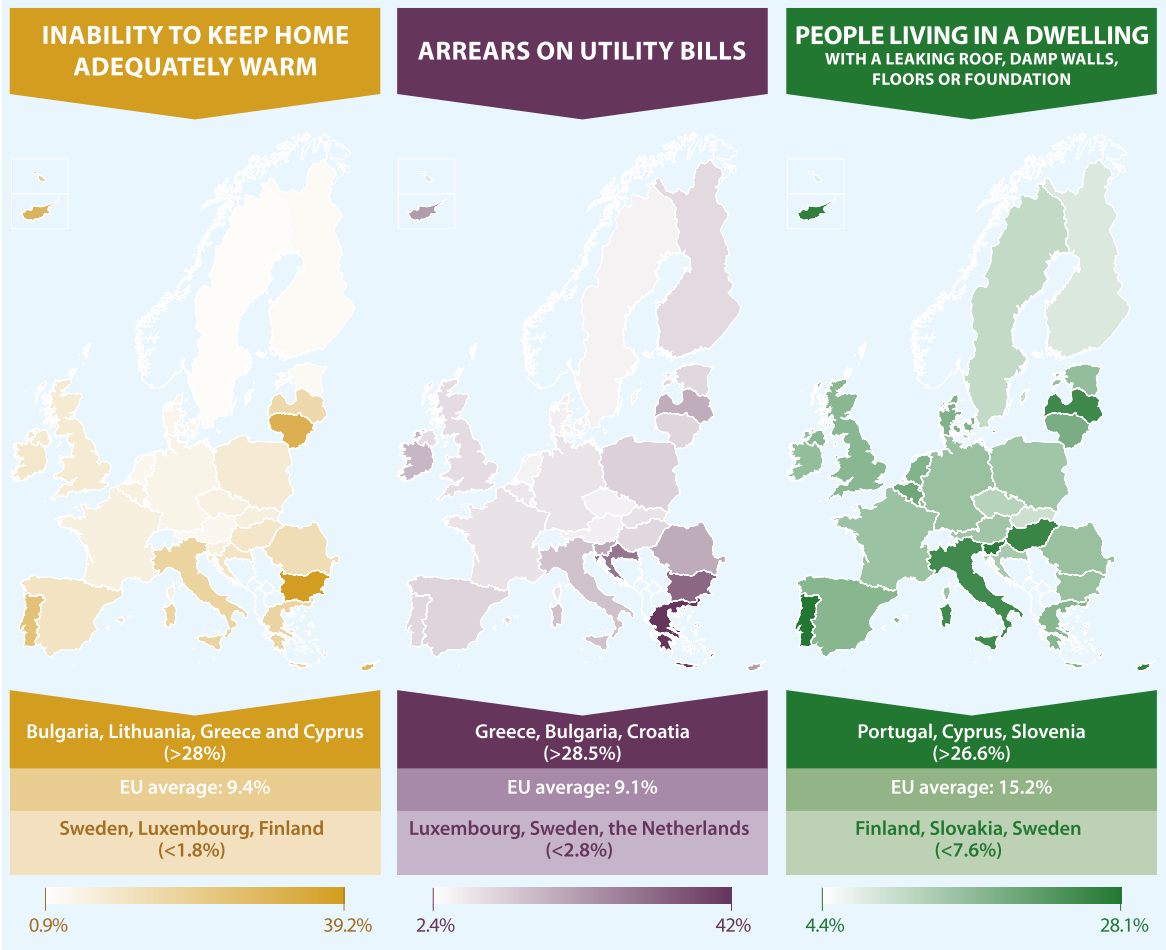



Figure 1. Energy poverty in Europe (Source: BPIE own analysis based on 2015 Eurostat data); https://www.bpie.eu/wp-content/uploads/2017/04/Factsheet_A-170420v4.compressed.pdf

According to Eurostat (EU):

- **57 million (13%)** people in the EU can't keep their homes adequately warm during winter;
- **104 million (23%)** people in the EU cannot keep their homes comfortable enough during summer;
- **87 million (19%)** in the EU live in poor quality dwellings;
- **52 million (12%)** people in the EU face delays in paying energy bills.

Energy poverty concerns both heat and electricity and is directly linked to the energy consumption. Inability to satify basic energy needs comes from various sources, including inadequate development of energy infrastructure, characteriscs of housing infrastructure (e.g. lack of thermal insulaon, old and inefficient appliances) and low levels of energy awareness. The EU made it a policy priority to tackle energy poverty and protect vulnerable consumers in the

"Clean energy for all Europeans" package (2019).[4] Energy poverty remains one of the priority areas also in the EU's Renovation Wave[5], in which one of the key principles are "affordability and making energy-performing and sustainable buildings widely available, in particular for medium and lower-income households and vulnerable people and areas." The European Commission sees renovations as a lever to address energy poverty and ensure access to healthy housing for all households.

For more information visit the EU Energy Poverty Observatory's (EPOV) website: https://www.energypoverty.eu/. EPOV is a user-friendly and open-access resource promoting public engagement on the issue of energy poverty and disseminating many useful material and good practices for those wishing to learn more about the problem and join efforts to tackle it. The material addresses many actual circumstances influencing the situation of energy poor or vulnerable households, like the outbreak of the COVID-19 pandemics. In this aspect, it is especially worth to check out the June 2020 report on the ways the COVID-19 crisis is affecting households: https://op.europa.eu/en/publication-detail/-/publication/4a440cf0-b5f5-11ea-bb7a-01aa75ed71a1/language-en

## What is the definition of energy poverty?

Definition of energy poverty is a complex issue but also an important one as it allows for appropriate measurement of the problem and for planning support measures. There are several different approaches to define and conceptualize energy poverty within the EU. The first official definition of energy poverty, still unofficially used in other countries, was introduced in the UK in 1991. It says that "a household is said to be fuel poor if it needs to spend more than 10% of its income on fuel to maintain an adequate level of warmth."[6] It needs to be highlighted, however, that the multifaceted nature of energy poverty makes it very hard to pinpoint households affected by energy poverty by a general and official definition, especially when it may manifest throughout Member States and on local or state level in various ways. One of the most straightforward definitions may be the following:

**'A household is called energy poor if it is unable to afford the level of heang or other basic ener gy services needed for a decent quality of life.' [7]**

4. https://ec.europa.eu/energy/topics/energy-strategy/clean-energy-all-europeans_en
5. https://ec.europa.eu/energy/sites/ener/files/eu_renova on_wave_strategy.pdf
6. https://ec.europa.eu/energy/eu-buildings-factsheets-topics-tree/energy-poverty_en
7. Feldmár, N. (2020, October 5). Energiaszegénység. Éves Lakhatási Jelentés 2020 | Habitat for Humanity. https://habitat.hu/sites/lakhatasi-jelentes-2020/energiaszegenyseg/

## How energy poverty manifests in practice?

Energy poverty has many economic, health, social and environmental impacts. The economic ones include high living costs, necessity to prioritize expenses and sometimes generation of dept by not being able to pay energy bills in time. The health impacts are connected with the poor living conditions and include development of respiratory diseases and allergies, hormonal disorders, circulatory disorders, as well as the deterioration of the overall immune system. Social impacts include social exclusion, while the environmental ones high utilisation of fossil fuels, high emissions of GHG emissions, and - in some European regions – also high emission of other air pollutants as energy poor households often have individual boilers burning poor quality fuels.

Energy poverty often leads to so called 'vicious circles'. Low income, which is one of the causes of energy poverty, usually forces poor households to live in cheaper, bad quality housing that is hard to heat, increasing their bills and costs. Their personal and household circumstances may mean that they need to heat their homes for longer periods and to higher levels using more energy. Parcularly affected groups include **men and women out of work or in low paid, precarious jobs, people suffering from long-term sickness or disability, single mothers or mothers being at home with small children, the elderly, the multigenerational households etc.** When identifying energy poor on a local level special attention needs to be directed to these vulnerable groups of society. Hikes in prices and cuts in income make it increasingly difficult to manage, driving households into unacceptable choices between energy and other key needs like food, health care, school equipment or trips, and further into debt. By being constantly faced with these difficult decisions and associated pressure, the physical and mental health of energy poor persons can be severely affected with impacts on well-being, but also capacity to work, relate and participate.[8]

## What are the main causes and indicators of energy poverty?

Most studies agree that there are three main drivers or causes of energy poverty that work in combinaon as highlighted by the INSIGHT_E study:[9]

**1.** Low incomes
**2.** Poor thermal efficiency and housing
**3.** High energy costs

8. Sian, J. (2016). Social causes and consequences of energy poverty. In *Energy Poverty Handbook* (pp. 21–38). https://doi.org/10.2861/094050
9. INSIGHT_E. (2015). *Energy poverty and vulnerable consumers in the energy sector across the EU: analysis of policies and measures.*

There are also several different indicators that might be used to measure and assess energy poverty on the local level, like the ones included in the table below.

| | Rationale | Justification & challenges |
|---|---|---|
| **Expenditure-based** | Expenditure-based metrics capture affordability of adequate energy services for those on low income. ('Adequacy' only captured if using 'required' expenditure) | ✓ Captures key features of energy poverty<br>✓ Applied / tested in a number of MS<br>✓ Capture severity by use of different thresholds<br>– Problematic to implement across all MS (if based on required household energy due to the need for detailed modelling<br>– Sensivtie to energy price rises |
| **Consensual-based** | Self-reported indicators can provide an effective way of understanding perceived energy poverty and more explicit insights than quantitative metrics. This family of indicators could be a 'bacstop' or complementary to other indicators. | ✓ Main basis to date for assessment<br>✓ Can be used as a complementary indicator (FR, BE examples)<br>✓ Survey infrastructure in place, just needs improvement (see Thomson)<br>– May not adequately allow for effecv e quanfic aon<br>– ProbSurvey may not have any assiociated income dimension |
| **Outcome-based** | This family of indicators provides a proxy for energy poverty based on outcomes. There are two possible approaches - using u lity data or focusing on health outcomes (see Thomson in literature review + EuroMOMO) | ✓ Measure of actual outcomes<br>✓ For utilities, brings utilities in as key stakeholders help provide solutions<br>– Access to utility may be difficult<br>– Narrow proxy measure<br>– Many different factors impact health outcomes in addion t o energy poverty (see Healy 2003) |

Figure 2: Overview of energy poverty approaches

There are also other approaches - you can read more about energy poverty indicators, measurement methods and mul-dimensional factors e.g. in Sokolowski et. al. 2019[10] or check out EPOV's Methodology Guidebook: https://akaryon-epah.com/sites/default/files/downloads/observatorydocuments/2007/epov_methodology_guidebook.pdf

[10]. IBS. (2019). *Measuring energy poverty in Poland with the Mul dimensional Energy Poverty Index.* https://www.researchgate.net/profile/Piotr_Lewandowski3/publicaon/335986244_Measuring_ener gy_poverty_in_Pola nd_with_the_Muldimensional_Ener gy_Poverty_Index/links/5d88f1d5299bf1996f988d8a/Measuring-ener gy-poverty-in-Poland-with-the-Muldimensional-Ener gy-Poverty-Index.pdf

As mentioned above, the energy poverty is a complex but far from insoluble issue. However, it is usually the interplay between these multiple factors, including personal factors, that make a difference. Stefan Bouzarovski in a recent review article highlighted specific household energy needs as a fourth significant factor.

“Other factors are also highlighted. For example, in the INSIGHT_E Study: rate of energy price rises versus income growth, ability to access cheaper energy prices, household energy needs, efficiency of energy use and importantly specific policy intervention are addional factors (Preston, White, Blacklaws and Hirsch, 2014).”[11]

In different countries and regions there are different types of households that are especially prone to energy poverty. Generally, the King Baudouin Energy Precarity Barometer highlighted that single parent families (80% being women), single households and parcularly older single households are parcularly at risk. Unemployed people are also more vulnerable, 25.9% compared to 8.9% in work.

## European and Member States' answer to energy poverty

According to the Clean Energy for All Europeans Package, Member States must use their National Energy and Climate Plans (NECPs) and Long-Term Renovation Strategies (LTRS) to identify dwellings of people at risk of energy poverty and develop effective strategies for renovating these as a matter of priority. The Commission reiterated these obligations in **a Recommendation on Energy poverty** (14.10.2020)[12]: Members States should **assess the number of households in energy poverty** and they are also called to develop their own **criteria for defining energy poverty** in their national context by using the indicators outlined in the Annex to the Recommendation.[13] However (as of December 2020), the LTRS and NECPs currently handed in have massive gaps with regards to energy poverty as a recent analysis[14] shows. Member States must urgently deliver on these basic requirements. Providing **criteria for defining energy poverty and defining indicators on the national level** are a prerequisite to develop strategies and policies addressing energy poverty also on a local level.

11. Tod, A., H. Thomson (2016). Health impacts of cold housing and energy poverty. In Energy Poverty Handbook (pp. 39–58). European Union. https://doi.org/10.2861/094050
12. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32020H1563&qid=1606124119302
13. A set of stascal indicators measuring likely drivers of energy poverty and its consequences has been developed at EU level and are listed in the Annex to the Recommenda on.
14. https://caneurope.org/content/uploads/2021/01/Energy-poverty-report-_FInal_December-2020.pdf

## B. How can energy poverty be measured on the local level?

### Firstly, map own resources and existing information

Collect all available figures, graphs, research, datasets, statistical information, etc. about the municipality/given settlement, including (if possible):

- **list/database of potentially vulnerable households, e.g. elderly people, widows, single parent families, young students etc.;**
- list/database of those households that receive some kind of social subsidy, for instance housing aids/benefits or social firewood etc.;
- list/database of those households that have pre-paid electricity meters (establishing contact and cooperation with local energy supply company might be needed);
- list of "cut-off" households that have permanent or periodic problems with paying their energy bills (establishing contact and cooperation with local energy supply company might be needed);

Sometimes a lot of valuable information already exists within the different departments of the municipal administration. In this case, joint brainstorming sessions could be a great starting point. Bringing together different experts always creates a lot of synergies and can increase general efficiency.

**Tip:** During brainstorming deploy SWOT analysis to define the strengths, weaknesses, opportunies, threats of the given municipality. To increase efficiency (especially during COVID-19 situation) online tools (e.g. the MURAL platform) could be used for this task.

### Secondly, map and engage stakeholders

With their own knowledge, human and financial resources, as well as contacts stakeholders could help in finding, locating and getting in touch with the most vulnerable households. Therefore, creating a stakeholder map and inviting them to collaborate is highly recommended. Stakeholder maps could contain the most relevant NGOs, social organisations, energy suppliers, local companies etc. and their link to the given municipality and its ciztiens.

**Tip:** Use interactive online mapping tools and methods e.g. Mind Meister or Kumu map in order to define and map the most important stakeholders.

## Thirdly, evaluate and analyse collected data and information

With the help of the information and data collected, define the most vulnerable households and locate the most affected districts, quarters, streets, homes in the municipality. Data visualisation always helps the assessment process. It also helps to create illustrative charts and diagrams that will help the overall awareness raising of the problem and the communication campaign supporng municipality's response.

**Tip:** Use interactive map for visualizing data, such as e.g. https://www.energy-poverty.eu/en/interac ve-energy-poverty-map-cluj-napoca

## Fourthly, prepare targeted questionnaires and conduct interviews

After idenfication of vulnerable groups, it is highly recommended to make targeted interviews with the sample of energy poor households. The most reliable knowledge about the current situation of and the exact needs of energy-poor families should be gained on site. Interviewing affected people can also help the communication campaign by highlighting problems they mentioned about living in energy poverty. Furthermore, interviews could be combined with detailed energy consumption and habits quesonnaires. To make wide use of the data collected it is necessary to ask the interviewees to sign the necessary consent forms.

Read more about available online calculators and tools such as Power TARGET:
http://powerpoor.epu.ntua.gr/powerpoor-toolkit/target/

**Tip:** The optimal number of collected interviews and questionnaires could vary to a large degree (e.g. from few dozens to thousands). It mainly depends on the size, the capacity, and the resources of the given municipality. It is suggested, however, to cover as many 'types' of vulnerable households as possible.

## Fifthly, evaluate field experiences and make use of the results

Careful and professional evaluation of the results of the survey is needed. On the one hand, direct information from energy poor households can bring local decision-makers and experts closer to the root of the problems, which can boost the policy-making process and support schemes, as well as make them more effective and targeted. On the other hand, the results of the interviews and questionnaires can be well utilized in the local government's awareness and communicaon campaigns, which promotes solidarity and community parcipation to alleviate energy poverty in the given settlement.

### Sixthly, monitor local energy poverty permanently

Energy poverty is a variable phenomenon. It takes many forms and affects different social groups. The number of energy poor families depend on several external factors such as the economic crisis after COVID-19. Therefore, it is inevitable to update databases and knowledge about local energy poverty rates regularly (e.g. every two years).

## C. Resources needed to assess energy poverty on the local level

Assessing and tackling energy poverty requires different resources, including human and financial ones.

### Human resources:

The whole process of assessing energy poverty on the local level requires engagement of people – internal staff, stakeholders, volunteers. Especially **collecting (offline and online) questionnaires from energy-poor households is resource-consuming:** in order to get a wider picture of the current situation of the local energy poverty rates, it is inevitable to collect information on site (or on-line if COVID-19 safety measures are required). This kind of survey requires many resources: well-prepared experts/interviewers. The human resources for this work could be a bottleneck. Therefore, it is suggested to cooperate with the local stakeholders – e.g. **staff of the local social and civil organisations, health practioners etc.** In many cases, the local university can be involved since many students have to fulfil obligatory courses and field trips. Thus, the municipality's needs and the university requirements could be a perfect match. Afer a short preparatory course, **voluntary students** could collect a great number of questionnaires.

### Financial resources:

Financial resources are especially needed to cover some extra staff (if necessary) working on the assessment of the energy poverty situation, as well as the access to some databases and ICT support. The municipality can cover the costs from own funds or look for external co-funding. Following opportunies should be considered:

- Joining EU funded projects which are dealing with energy poverty. In the next financial period (2021-2027) energy poverty, just transition and the European Green Deal are going to be in the limelight.
- Applying for subsidies to enhance or create SECAPs (Sustainable Energy and Climate Action Plans) which contain energy poverty targeting for the given settlements.

## D. Overview of relevant good practices

### Bükkalja actual residential energy consumption mapping program
Hungary

Between 2015-2020 an extended rural survey program was carried out by the Department of Environmental and Landscape Geography of ELTE University, Budapest. A custom database was created by implementing surveys that involved more than 2200 households in 31 selements. The interviewers conducted the door-to-door survey and collected information about at least 10% of the occupied dwellings at the given settlements. A wide range of households were included. The gained database contains comprehensive information about household energy consumpon patterns incl. heating, cooking, electricity use; heat demands and actual energy billing data and energy efficiency e.g. insulation, appliances etc. This research could pave the way towards local, regional, national policies or EU funded programs and projects since energy consumption measurements should always be the first step before any energy saving action.

### Survey among single-family house owners in Sztum
Poland

The study was carried out in 2018 as a part of the Polish-German cooperation on the development of low-carbon economy in cities. The questionnaire was the first step of the wider research and aimed to assess the energy situation of buildings in one of the central municipal districts, as well as to select building that will be offered a free thermal audit. The target group were the owners of single-family houses in the district, which was specifically chosen as it is one of the oldest districts in the city with old buildings that have a significant impact on air polluon in Sztum. There are approximately 50 houses in this area.

The detailed objecvties of the survey were the following:

- collecting basic data on the buildings in the area: information on the number of houses, their condion, type, executed thermal isolation, investments,
- basic demographic data on households and their inhabitants (age, number of people in the household, average income, etc.),
- state of knowledge about available solutions for improving energy efficiency of households.

The lessons learned by the municipality are the following: the inhabitants' awareness of the issues related with energy saving and environmental pollution is growing year after year. The preferred incentive for energy saving is the possibility to save on electricity bills.

## Measuring energy poverty in Poland with the muldimensional energy poverty index
Poland

The Institute for Structural Research (IBS) have created a muldimensional energy poverty index using the methodology proposed by Alkire and Foster (2008). The index considers five dimensions of energy deprivation: two objective indicators of “low income, high costs” and “high share of energy expenditure in income”, as well as three subjective indicators of “inability to keep the home adequately warm”, “presence of leaks, damp or rot” and “difficulties with paying the utility bills”. Multidimensional indicator helps to avoid conflicting interpretations and results that arise when using a select group of indicators. The interpretation of this energy poverty index is simple and intuitive - a household is identified as energy poor if it experiences at least two forms of deprivation. Households living in buildings built before 1946, households living in rural areas, and households that are dependent on retirement and disability pensions or on unearned sources of income are considered to be at the especially high risk of energy poverty.

More informaon is available at: https://ibs.org.pl/en/publica ons/measuring-energy-poverty-in-poland-with-the-mul dimensional-energy-poverty-index/

## Energy Poverty Map of the Cluj-Napoca metropolitan area
Romania

An interactive online map of the Cluj region was developed and published to raise awareness about energy poverty among public, private and regional stakeholders. The overall goal of the project, through innovative research focusing on the linkages between energy poverty and emissions reductions, was to provide new insights and guidance on how to effectively integrate sustainable development strategies into local policy frameworks.

The interactive map allows the user to perform a set of actions, based on the data and tools available. Visually, the user is provided with a base map on top of which different sets of layered data can be added or removed, integrated, selected and analysed. Being an interactive map, the interface allows the navigation inside the map trough the zoom in and zoom out tools, and the return to initial extent tool. In order to visualise the provided sets of data, the user can check the boxes next to each layer presented in the Layer List. Geographical Information Systems (GIS) provide spatial data structured as layers; therefore, one or more layer can be visualised simultaneously, allowing the user to make a comparative spatial analysis of the data. Besides the layer list, the Legend infographic helps the user understand the symbols used in the checked layers. The map will stay available past the project end and can be used as an information tool for energy-saving measures and for accurate targeting of energy-efficiency and energy poverty alleviation projects and policy.

More information is available here: https://energy-poverty.eu/en/interactive-energy-poverty-map-cluj-napoca
PDF with instructions on how to navigate the map: https://energy-poverty.eu/sites/energy-poverty.eu/files/documents/instructions_for_the_interactive_ep_map.pdf

# STEP 2

# Planning action against energy poverty

## A. Setting up a municipal energy poverty action plan

Member States are required by the EU law[1] to use their Naonal Energy and Climate Plans (NECPs) and Long-Term Renovaon Strategies (LTRS) to set out policies that reduce energy poverty – including definions, indicators and time frames. More recently, the European Commission (EC) has idenfied alleviang energy poverty [2] as one of the three key priories of the EU's Renovation Wave and published its Recommendation on energy poverty to support Member States in taking action.

**According to the EC's Recommendation on energy poverty**, Member States should implement the following actions:

- **Assess the number of households affected by energy poverty.** In case of a significant number of energy poor households, NECP should include a national objecvtive, as well as policies and measures to reduce energy poverty.
- Develop their own **criteria for defining energy poverty** according to their national context (by using the indicators outlined in the Annex to the Recommendation).
- Develop **targeted financial solutions** for lower-income households, together with easier access to essential services, energy audits and energy performance certificates.

Current reports on energy poverty[3] show that national plans, policies and measures in many of the Member States are still inadequate to tackle the issue successfully. Municipal decision-makers, as well as other regional and local actors at the forefront of dealing with the manifold impacts of energy poverty often try to fill this 'regulatory gap'. Whereas the topic gains more and more attention all over Europe – in particular through local administrations and provincial deputations – these actors see themselves confronted with a number of challenges.

Since energy poverty is of a spatial nature, it can vary both within regions and even within cities. It should therefore be directly addressed at the local level. However, regional/local policy instruments should be embedded in a coherent **national action plan or strategy** to maximize policy efficiency.

1. Based on the Energy Efficiency Direcve, as amended by Direcve 2018/2002/EU and Energy Performance of Buildings Direcve 2018/844/EU
2. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32020H1563&qid=1606124119302
3. LIFE Unify (2020), "Tackling energy poverty through National Energy and Climate Plans: Priority or empty promise? http://www.caneurope.org/docman/energy-union-governance/3681-energy-poverty-report-final-december-2020/file; Thomson, H. and Bouzarovski, S. (2018), Addressing Energy Poverty in the European Union: State of Play and Action, https://www.energypoverty.eu/publica on/addressing-energy-poverty-european-union-state-play-and-ac on; Creutzfeldt, N., Gill, C., McPherson, R. et al. The Social and Local Dimensions of Governance of Energy Poverty: Adaptative Responses to State Remoteness. J Consum Policy 43, 635–658 (2020). https://doi.org/10.1007/s10603-019-09442-z

Recent studies show that local actors (municipal or community-based actors, NGOs etc.) over Europe play a key role in helping energy poor consumers to get access to help and advice. By doing so they not only represent an adapv e response to the shortcomings of national policies but also ofen provide more effecvtie measures.[4]

In addition to a comprehensive national strategy, it is highly recommended that municipalies develop **local action plans against energy poverty** in order to provide a profound framework for effective measures and set precise and appropriate energy poverty alleviation targets on the local level.

### How to develop a municipal energy poverty action plan?

1. **Establish and describe facts** concerning energy poverty in a local context.
2. **Identify the level of energy poverty** within the municipality (considering possible spatial patterns with poor quality buildings and/or poorly accessible areas; analyzing energy carriers and related costs and efficiency).
3. **Identify energy poor households (profiles)** and choose your target groups (by combining energy poverty data with other social datasets, it is possible to identify those people who are most severely affected by fuel/energy poverty so that interventions can be targeted towards those most in need).
4. **Identify challenges** in addressing the causes of energy poverty, which are specific to the municipality, as well as addressing the targeted households themselves.
5. **Set** achievable but still ambitious **energy poverty alleviation targets.**
6. **Identify human, technical and financial resources** needed to implement the plan.
7. **Identify the actions and targeted policy measures** that you intend to implement within the plan, which will be measured against a series of outcomes and indicators.
8. **Define monitoring and reporting measures** (for measuring and reporting the impacts of energy poverty interventions taken regularly).
9. **Establish horizontal cross-sectoral coordination** (e.g. appointing an energy poverty team, committee or officer) within the municipality, assigning clear responsibilies.
10. Set up **consultative and participatory mechanisms fostering the multi-stakeholder engagement** and identifying opportunities for cooperation with relevant external stakeholders and/or with neighbouring local authorities.

4. Creutzfeldt, N., Gill, C., McPherson, R. et al. The Social and Local Dimensions of Governance of Energy Poverty: Adaptive Responses to State Remoteness. J Consum Policy 43, 635–658 (2020). https://doi.or g/10.1007/s10603-019-09442-z

Due to energy poverty being such a complex concept, its definion can vary according to the social, economic and geographical context. Complex are also the implicaons that energy poverty has on the health, wellbeing, social inclusion and quality of life of affected cizens. For these reasons, the phenomenon has to be taken into account in numerous policy areas, including the ones of energy, climate, social, consumer, family, educaon and housing affairs. It should be included in relevant policies and strategies and the municipal energy poverty acon plan should be coherent and integrated with them. Only then it will not only help to properly address and support energy poor households but also contribute to other relevant targets, such as e.g. the reduction of energy consumpon and air pollutants emissions within the municipality.

To ensure that adequate action is taken to prevent or alleviate energy poverty, the action plan should not be regarded as a fixed and rigid document. Since circumstances can change and the ongoing actions provide results and generate local experience, it may be necessary to revise and fine-tune the plan on a regular basis.

A good example for a profound municipal action plan on energy poverty is the **Fuel Poverty Action Plan of London**, 2018. See more at: https://www.london.gov.uk/sites/default/files/fuel_poverty_action_plan.pdf

It is also highly recommended to integrate policy measures related to alleviation of energy poverty into other local plans, e.g. focusing on climate and energy such us e.g. Sustainable Energy and Climate Action Plans (SECAPs) developed by municipalities being Covenant of Mayors signatories.[5]

Useful Information may be found in the Covenant of Mayors webinar: *Tackling energy poverty in your SECAP - Where to start and how to get funded*, which is accessible at: https://drive.google.com/file/d/1iluAykCgERQQXHLKAn_FcqNKT2ScfSlm/view

## B. Designing effective energy poverty policies and measures in a municipality

Designing the most proper local energy poverty policies and measures, to be included in a municipal energy poverty action plan, is of key importance for the success of the initiative. It is worth to get familiar with and take inspiration from the already existing plans, developed by municipalities already dealing with the problem, as well as from many guidebooks and good practice databases developed by organizations tackling energy poverty.

5. https://eu-mayors.ec.europa.eu/en/

The **EU Energy Poverty Observatory (EPOV)** provides strong support to local administrations wishing to tackle energy poverty, by dealing with the following topics:

- capacity building activities
- methodological guidance
- best practices and pilot actions
- energy poverty assessment

More information may be found at: https://www.energypoverty.eu/

This **Guidance of EPOV** provides information about the design of practical energy poverty policies in municipalities inthree steps:

- STEP 1: Shortlistmeasure
- STEP 2: Exploremeasure
- STEP 3: Define measure

Read more at: https://www.energypoverty.eu/sites/default/files/downloads/publicaons/18- 07/guidance_-_energy_poverty_policies_in_cies.pdf

It is also highly recommended to take energy poverty into account in all other ongoing policies and policy instruments. All active measures and measures related to energy efficiency, renewable energies and transport should be reviewed with regard to the effects on the vulnerable households.

The next step represents the key challenge: deriving measures from the initial review and selecting the most proper and effective ones. It appears that municipalies using a combination of multiple types of measures are more successful at alleviating energy poverty. An assessment of the Institutie for Structural Research (IBS)[6] gives an overview on the three types of policy instruments currently widely used in the EU countries and their efficiency at reducing energy poverty.

| Instrument | Cost | Effectiveness | Targeting efficiency |
|---|---|---|---|
| Energy advisory services, energy saving improvements | low | average | low |
| Fuel allowance targeted at energy poor households | average | average | average |
| Thermal retrofit coupled with professional counselling | high | high | high |

*Assessment of the efficiency of the proposed instruments (Jan Rutkowski, Katarzyna Sałach, Aleksander Szpor, Konstancja Ziółkowska (2018), How to reduce energy poverty in Poland? IBS Policy Paper)*

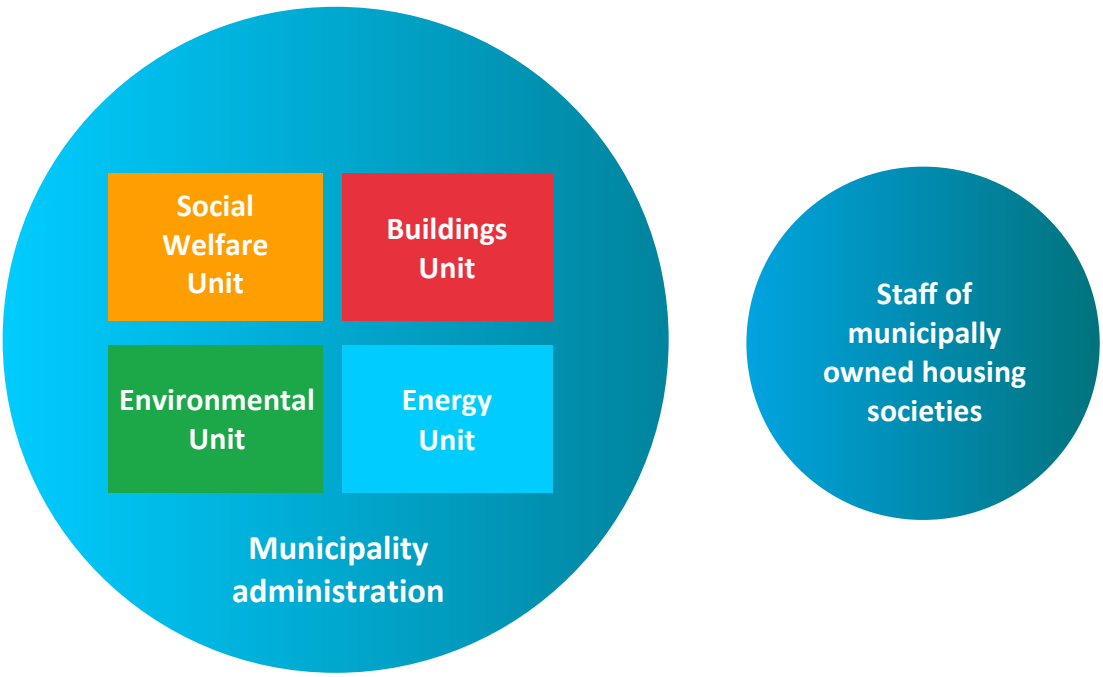
6. Jan Rutkowski, Katarzyna Sałach, Aleksander Szpor, Konstancja Ziółkowska (2018), How to reduce energy poverty in Poland? IBS Policy Paper

The document indicates that **thermal retrofit** is the tool that most effectively solves the problem of energy poverty, but is also the most expensive one. Since energy inefficiency is a primary driver of energy poverty, implementing energy efficiency schemes would reduce energy poverty rates in the long run, as well as bring about a range of other energy and non-energy benefits. Targeted **fuel allowances** are slightly cheaper, but they do not guarantee a permanent solution to the problem. **Energy advisory services and energy-saving improvements** are the most financially beneficial instrument, however, they have a limited practical impact on the household's situation.

Useful Information may be found in the **Covenant of Mayors** webinar, 2018: How to design effective policies against energy poverty in municipalities, which is accessible at: https://eumayors.adobeconnect.com/puoc6cwbm7xm/

## C. Cross-sectoral coordination and stakeholder engagement

Alleviating energy poverty and designing good energy poverty action plan requires a cross-sectoral approach by the local administration. In addion to a clear political mandate, a stable cooperation between different departments and assigning clear responsibilities are crucial.[7]




7. Recommendation of the Covenant of Mayors Climate and Energy https://www.covenantofmayors.eu/index.php?op on=com_a achments&task=download&id=548

Building up the stakeholders' support is a key element of successful energy poverty interventions at a municipal level. All policies should be designed, implemented and monitored based on meaningful and accountable processes of public parcipation and broad stakeholder engagement. The process of developing measures should be built on close cooperation between all levels of administration, in order to enable close cooperation between regional and local authories, civil society organizations, and private sector entities.[8] Stimulating and maintaining connections between the social, energy, health and environmental institutions and stakeholders, as well as ensuring data exchange, are also highly relevant. Since one of the biggest challenges at the local level is financing actions alleviating energy poverty, private stakeholders and financial instituties can play a key role in this field.

**External stakeholders** on the municipal level, whose support is needed for the designing and implementation of the energy poverty action plan, are the following:

- Private homeowners, landlord & tenant associations, house management organizations
- Social actors, charities and NGOs
- Consumer protection agencies
- Energy consultation organisaons
- Health care organisations
- Energy suppliers, network operators, service providers, local businesses
- Financial institutions and private stakeholders (as financiers)
- Researchers and academia

Local actors working within the networks, which include municipal government/administrative actors and external stakeholders, can also use their key roles within the governance framework to influence national government policy and push for change, while at the same time assisting with the implementation of existing measures and taking independent action where current state action is lacking.

8. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32020H1563&qid=1606124119302

## D. Overview of relevant good practices

### Involving local environmental and social organisations to enhance community engagement and trust

Spain

**Fuel Poverty Group in Catalonia** is a group of volunteers, a network of people and organizaons, fighting energy poverty on municipal level. The project is structured around the involvement of volunteers as a tool for mobilization and citizen engagement against energy poverty. Their strategy is based on prevention and direct action against energy poverty by training volunteers to be energy advisors in neighborhoods, and by carrying out on-site visits within households. The project was backed by municipal grants, grants from the Catalan Regional Government and from private companies.

More information: **Atlas of Energy Poverty Initiatives Europe** (ecoserveis, 2017), pages 62-63,https://www.ecoserveis.net/wp-content/uploads/2019/02/Atlas-of-energy-poverty-ini a ves-in-Europe.pdf

### Action Plans for Tackling Energy Poverty in the Municipalities of Baboszewo and Mińsk Mazowiecki

Poland

Tackling energy poverty, as tackling any major local challenge, requires a long-term approach and good planning. Several Polish cities, including City of Baboszewo and City of Mińsk Mazowiecki have already developed comprehensive municipal **Action Plans for Tackling Energy Poverty**. These plans identify the scale of energy poverty in the municipality, as well as actions and tasks that will reduce this problem and its negative impact on the lives of citizens. The main objective of the strategy is to improve the quality of life in the municipality.

This goal will be achieved through specific objectives:

- Combating energy poverty by supporting modernization of buildings and properties in the municipality.
- Providing support for the poorest inhabitants of the municipality who have problems with covering the costs necessary for ensuring adequate energy comfort.
- Creating a support structure for energy efficiency improvement of buildings and decarbonization of heat sources in households classified as energy poor.
- Promoting good practices and educating on efficient use of energy.

Link(s) to further information on the action plans:
(1) **Action plan for tackling energy poverty for the Municipality of Baboszewo for 2018-2023**: https://www.bip.gminababoszewo.pl/960,uchwaly-2018-rok
(2) **Action plan for tackling energy poverty for the Municipality of Mińsk Mazowiecki for 2019-2023:** https://www.bip.minskmazowiecki.pl/996,x-sesja-rady-gminy-minsk-mazowiecki-22-sierpnia-2019-r

## Local Shielding Programme - Cracow (2014-2022)
Poland

The Programme is implemented under a resolution of the Cracow City Council by the Municipal Social Welfare Centre in cooperation with the Environmental Protection Department of the Cracow City Hall.

The aim of the Programme is to support a group of heat consumers, who incur increased heating costs resulting from a permanent change of their heating system to the pro-ecological ones. The benefit is granted for a defined period, depending on the income per person in the given household (separated into one-person households and multi-person households) per 1 m2, with a maximum limit and taking into account specific amount for each type of fuel.
More information in Polish language may be found on the following websites:

(1) https://www.bip.krakow.pl/?dok_id=97105
(2) https://sdr.gdos.gov.pl/Documents/OPiE/Spotkanie%2024-26.08.2016/07.%20MOPS_LPO.pdf

# STEP 3

# Reaching and engaging households

Information and advice campaigns related to energy savings and energy efficiency are widespread on the municipal level, but mostly aim at households in general. When trying to alleviate energy poverty, however, it makes sense to focus on the most vulnerable households and choose the available policy measures accordingly.

After having successfully identified the most vulnerable households within the municipal boundaries (i. e. low-income households, households with high energy costs etc.) and the locally available 'policy mix' the next crucial step is how to approach and engage these in energy savings projects.

## A. Different access to different target groups

To start with, municipal experts should get a clear overview of already existing and possible points of contact between the local administration and different types of households that are affected by energy poverty:

- (1) Often, energy poor households have a low income and receive social welfare payments. Reaching out and offering additional help to those households that show up in the local unemployment statistics can be a very effective and target-oriented way. In addition, local debt counseling programs can be a good starting point to introduce the topic of energy cost savings. The municipal social departments should have a good overview over both.

- (2) A second group are households with a low income that do not receive social welfare payments. Here, the interaction with the local administration reduces drastically compared to the first group. These households could be approached in different ways – e.g. via the yearly service charge settlements of their landlords or via the electricity billing of their energy supplier. Especially in case the households take part in social housing programs and are supplied by local public utilities the municipality can exert their influence.

- (3) There are, however, also middle-income households that have to spend a high share of their income on energy costs. These households should also be approached in different ways – in addition to the before mentioned also regional energy agencies, consumer protection agencies or local chimney sweep associations could be a good alternative.

For middle-income households that own and not only rent residential property the role of low-cost thermal retrofit measures as a means to tackle energy poverty should be emphasized. This important issue is often neglected by energy consulting services.

**Tip:** Using already established municipal contacts with low-income households is key.

**Tip:** Establishing an "energy poverty team" that incorporates staff from the environmental and social departments as well as important external actors helps. Setting up regular meetings, clear responsibilities and goals can be a good starting point.

**Tip:** Try to engage local utilities and/or local energy agencies, consumer protection agencies and social welfare organizations as early as possible. If they do not run energy savings projects themselves they surely have valuable input to give. .

**Tip:** When energy advisers are recruited or trained, a particular focus should be put on their communication and social skills. It is also recommended that visits are performed by energy advisers working in pairs: one with technical skills, and the other with social skills.

## B. Different communication channels for different purposes

Before initial contact with different target groups – and depending on the purpose of the communication – local administrations should choose communication channels that seem most appropriate to achieve maximum attention and engagement in their specific context. There are two main layers to it: creating general awareness of a wider audience and engaging energy-poor households in concrete projects. For both communication targets there are plenty of communication channels available.

## C. Creating general awareness for energy poverty and possible solutions

Raising general awareness for the topic of energy poverty is crucial for various reasons. Most importantly, this helps in creating political support, in mobilizing additional funding and in activating new collaborators. Launching a campaign that highlights the daily challenges of energy poor households can be an effective mean to raise general awareness for the issue. Its impact could be maximized by winning a prominent person/celebrity for the campaign. No matter which communication channel is chosen, it is essential to use a positive, encouraging wording that emphasizes the opportunities of the suggested measures.

The following communication means seem most appropriate for this overall objective:

- **Newspaper articles/interviews**
  Traditional newspaper articles on the challenges of energy-poor households as well as on possible solutions are a good way to introduce the topic to a wider audience. They should have a good timing and preferably be linked to a suitable occasion. It can be a good idea to publish these articles in the heating season, preferably before Christmas. A focus on local and regional newspapers seems the most promising to create maximum awareness and immediate concern for the problem.

- **Articles in professional journals/magazines for a municipal audience**
  To raise interest for the topic within municipal administrations articles in specialized municipal journals or magazines can be a good communication channel. These should preferably be journals with a wide range of municipal topics and a wide spread to guarantee maximum impact. Good opportunities are journals and magazines that are issued by national municipal or cities associations.

- **Social media**
  Social media is an effective and cost-efficient way to raise general awareness for the topic of energy poverty. Via Facebook and Instagram a non-professional general interested audience can be reached. Twitter also allows targeting a more professional audience. As local administrations often are not at the forefront of social media usage external support can be worthwhile.

- **Podcasts**
  Podcasts are a good way to process a lot of information in an easily digestible way for an interested (professional) audience. Small interview sequences of 10-15 minutes with staff of local projects on energy poverty alleviation can be a good way to inform interested staff in other local administrations. A good starting point can be three different audio-takes (one with a project leader, one with an energy consultant, one with a person from an affected household). The results can be distributed via relevant municipal newsletters, blogs, professional magazines, social media etc. The municipality's press office should be able to give advice and/or recommend external communications agencies.

- **Radio features**
  Similar to podcasts, radio features are helpful to process a lot of information in

a short time since speaking/listening is always faster than reading. Local or national radio stations can be approached with the urgency of the problem – that has aggravated due to Corona/Covid19 – and interesting success stories. Featuring small quotes by project leaders, energy consultants, affected households, scientists and politicians can make this very lively.

## D. Engaging households affected by energy poverty

Besides raising general awareness and interest in the topic of energy poverty the main focus should lie on engaging energy-poor households. This entails raising their awareness, giving them tailored information/advice and finally motivating them to become active.

In order to get affected households engaged and take ownership of the process, a positive impact of the project should be directly attributable to it. This often are immediate rewards such as give-away energy saving products or medium-term benefits such as monetary savings. It is important to not overwhelm affected people with a range of different options, but rather provide a set of simple first steps.

**Tip:** A very successful approach is to train former jobless persons as energy savings consultants for energy poor households. This can reduce initial reservations since the energy consultant knows about typical problems from her/his own firsthand experience and may enjoy more trust.

**Tip:** Consider giving out basic information material in other languages as well. Depending on the local context, immigrants, often used to other climate conditions, and sometimes with limited knowledge of the local language might be an important sub-group of the affected households.

**Tip:** Another idea to enhance engagement and commitment is to give out simple certificates for environmentally friendly behavior.

## E. Communication channels

The following communication channels seem the most appropriate for this objective:

- **Project leaflet**
  Project leaflets capture the essence of a local energy savings project. They are a simple, but effective tool to make the project known to the main target groups. They can be easily disseminated during every possible direct exchange occasion to energy poverty affected households. This can be in municipal unemployment assistance, debt counseling programs or social housing schemes.

- **Website**
  A simple and motivating project website that clearly communicates the advantages of the offered assistance program is key. It should be easily understandable and use motivating language and pictures. Contact persons, preferably with pictures, should be clearly named with phone number, counseling hours, email and postal address. A short FAQ section might help as well. Providing information in English or in other languages could be also useful depending on the local context.

- **Letter**
  Occasionally, the 'good old' information letter promoting the energy poverty assistance offered could also be an appropriate mean to reach out to vulnerable households. These letters could, for instance, be sent together with the yearly service charge settlements of the landlord or together with official municipal letters (e. g. concerning unemployment aid etc.). A good timing would be the start of the heating season.

- **Word of mouth**
  Often a very successful informal channel of communication is via local community groups, initiatives, and social welfare organizations as they have profound and face-to-face contact with vulnerable households.

For continuous collaboration and consultancy

- **Phone & video calls/virtual technicians**
  Phone calls are still the most common means to communicate. It is faster and easier to speak than to write for most people and it offers the possibility for further inquiries.

**Tip:** In times of Corona/Covid19 video calls offer an additional possibility for live counseling that allows showing things hands-on (e.g. walk a person through their own household).

- **Energy cafés**
  Energy cafés provide advice on energy-related matters (e.g. on energy bills, fuel debts, energy savings etc.) in a welcoming setting. Thus, they create places of face-to-face interaction. This can be a very effective approach in the local neighborhood.

- **Energy helplines**
  Home Heat Helpline in the UK was an important service offering free help and advice for those struggling to pay their energy bills.

- **Moderated support groups via messenger apps**
  Another possibility to engage affected households and to stay in contact is to set up a moderated support group via any messenger app.

- **Energy savings apps**
  There are plenty of energy savings apps available at the market today. Essentially, they all help to unveil energy savings potentials. As information tools they can play a valuable role to incentivize low-carbon lifestyles.

- **Energy saving weeks or energy poverty day**
  A campaign week or day organized jointly by internal (municipal) and external stakeholders such as consumer protection agencies and social welfare organizations.

**Tip:** No matter which communication channel is chosen, it is essential to use a positive, encouraging wording that emphasizes the opportunities of the suggested measures.

**Tip:** To maximize impact and engagement of energy poverty projects follow-up contacts/ meetings after initial consultancy are necessary.

## F. DO's and DON'Ts in reaching out and engaging energy poor households

### Do's

- Set up a diverse "energy poverty (communication) team", including experts from different municipal departments, but also other professionals.
- Choose main communication channels according to target groups and objectives.
- Raise public awareness for the topic to generate political support.
- Tell/Distribute personal success stories.
- Foster 'default' engagement opportunities for affected households.
- Use a motivating language that emphasizes opportunities in all communication activities.
- Plan follow-up activities with participating households after energy savings consultancy.
- Have developed communication material critically reviewed by external experts.

### Don'ts

- Do not stay 'in your bubble'. Involve relevant actors such as the local energy supplier or social welfare organizations in your campaigns. Seek out other municipalities for advice.
- Do not try to solve 'all' socio-economic problems of energy-poor households. Focus on energy savings.
- Do not focus on the problems or deficits, but rather on the solutions and various support offers.
- Do not portray energy poverty as a one-dimensional topic but rather as a multifaceted and oftentimes highly individual one.

## G. Overview of good practices

**Munich ‚white goods'**
Germany

Munich initiated a 'white goods' program for the exchange of old, inefficient electric household appliances (such as refrigerators, washing machines, stoves). Households with a low income can apply for the free-of-charge funding opportunity. If they qualify they receive a voucher over 600 €. An additional energy consultancy is obligatory.

## Nuremberg ESP
Germany

The ‚EnergieSparProjekt' (ESP) Nuremberg is a free-of-charge energy consultancy service for disadvantaged households in Nuremberg. The project sends out trained energy consultants to site visits of the affected households, giving them hands-on advice on reducing their electricity and heating bills. Average costs savings per households amount to approximately 250 € annually. This also saves a lot of CO2 emissions.

More information: https://www.nuernberg.de/internet/sozialamt/energiesparprojekt.html

## Munich ‚socio-educational energy consulting'
Germany

In addition to other municipal services, the Institute for Socio-educational Work (I.S.A.R.) in Munich offers an energy consultancy for people with special needs. This can be people with a migration background and corresponding language barriers or jobless people that live in extreme poverty. The energy consultants have a strong background in socio-educational work. They help the affected persons by connecting them with various other help offers and do a basic energy consultancy.

More information: https://www.isar-muenchen.de/

## Stromsparcheck Bundesprojekt
Germany

The StromSparCheck project is a well-established project that helps households all over Germany to save electricity and water. This is mainly achieved by an on-site visit at the households and by giving away basic electricity and water savings devices, such as LEDs. The StromSparCheck project is implemented by the German welfare organization Caritas, in close cooperation with the regional energy and climate protection agencies.

More information: https://www.stromspar-check.de/

STEP 4

# Implementing measures

## 4.1. Manuals and trainings

There are many methods and ways that can be used to tackle energy poverty. One of them can be the development and dissemination of various guides and manuals or organizing trainings and workshops for the local community. Although both methods are different, their aim is to increase the knowledge and awareness of the local population on energy efficiency.

## A. Manuals

### How to start?

If we decide to choose a method regarding the development of guides/manuals for residents, we need to properly think through all the steps, which should include the steps sequentially:

- Establishing the topic and scope
- Selection of experts who will develop the material in terms of content
- Determining the methods and channels of distribution (electronic and/or paper version)
- Selecting an expert to develop the material in terms of graphics and language

The material created can cover all topics directly or indirectly related to energy poverty, such as:

- What is energy poverty
- What are the consequences (including health) of energy poverty
- Air quality - how it should be and what has an impact on it
- Explanation of what goes under all the headings of the energy bill
- Energy losses in homes - what they are and how to identify them
- Ways to save electricity and heat
- Proper use of heating equipment
- Tips on saving water
- House insulation methods (including effectiveness and cost)

## How to continue?

After deciding on the topic of the tutorial, you need to find a specialist who will deal with it from the content side. It is important that the chosen person creates a text in a language that will be understandable and relevant to the intended age and level of knowledge of the recipients. In many larger cities, there are universities that offer faculties related to energy or environmental managing/engineering - this is where you should start looking for specialists in this field. When there is no large city near your village, in where you can find a university, it is worth turning with this matter to the secondary school - technical school. There are also often realized this type of faculties, so there must be specialists who educate in this area. Nowadays, there are more and more companies/NGOs dealing with renewable energy, improving energy efficiency, modern heating systems, or environmental protection - certainly in such places you can also find experts willing to undertake the merit part of the publication.

Once the right person has been found and all the formalities regarding the scope of the publication have been settled, the next step, which is to determine the methods of distribution, can begin.

The created educational material can appear in paper or electronic form. It is also possible to distribute both versions in parallel. When it comes to paper distribution - knowing which households are struggling with energy poverty, it is recommended to deliver such a guide to their mailbox or even to their own hands. Another way to distribute them is to take them to social services, youth centres, libraries, schools, town halls, public utility companies. If you place them next to the exit, every interested person will be able to take the guide with them when leaving. It is also recommended to distribute the guidebook to stakeholders during different environmental actions or events like "Energy Days". Looking for online distribution methods, all local media, relevant social media platforms and internet portals should be identified. The other distribution channels remain in this case like those for the paper version, except that you should address a request to put the guide online on the website of the social services, schools or municipalities. Establishing the distribution channels in advance is a very important step because it can be done in parallel with the substantial work on the text, and thanks to this, once the guide is ready, you can immediately start distributing it.

While the substantial part of the guide is being developed, you should also take care of choosing a graphic designer, who will give a clear and aesthetic form to the publication. It is important to set the right requirements. If you want the guide to reach people affected by energy poverty, you should make sure that it has a design suitable for their needs. The problem of energy poverty often affects older people, so it is worth taking care of the appropriate clarity of the material.

## B. Trainings

### How to start?

Deciding to organize training for residents to tackle energy poverty, you should follow the steps below:

- Establishing the topic and scope of the training
- Selecting the speaker
- Setting the time and place of the workshop
- Disseminating information about the event

The material created can cover all topics directly or indirectly related to energy poverty, such as:

- Demonstration of proper furnace burning technique
- Demonstration of a thermal imaging camera
- Demonstration of equipment related to renewable energy
- Demonstration of the differences between different types of insulation
- Demonstration of smog phenomenon
- Demonstration of electric meters

### How to continue?

In order to find a suitable speaker, it is advisable, as in the case of the author of the guide, to look for a specialist from high school or university, or to use a local environmental or RES company. It may be that the municipality has a municipal energy manager, in that case it is worth asking him or her for such a speech. The persons in this position will certainly have the necessary education to carry out the training.

The next step is to set the place and time of the event. As far as the location is concerned, it should be easily accessible to everyone, e.g. a conference room in a city hall or a school. When setting the time of the event, remember to consult it with the speaker first and adjust the hours so that everyone can take part in the event, including working people (if the training is addressed to them).

Having set the program, time, and place of the event - you should begin to disseminate information about it. The distribution channels are similar to those of the guide - it is recommended to place information about the workshop in the local press, on information posters in the city, on the websites of municipal offices and also send information to the local and social media. You can also inform teachers about the event, so that the information will also reach parents through their students.

The next step is the logistical planning of the event. If there is such a possibility, it is worth conducting sign-ups or registration for the training, so that we can initially estimate the number of participants. This step also includes technical issues, such as the sound system, the person operating the equipment during the event.

## C. Overview of good practices

Many different types of trainings for citizens have already been carried out, and several publications have already been developed that can inspire the creation of a guide. Selected examples of good practices of these methods of tackling energy poverty can be found below:

**Training on energy efficiency and loan programs**
Poland

In the town hall of Wałcz a meeting for residents was organized, in which the following topics were discussed by an energy advisor and a specialist for the Prosument Program and Individuals:

- how to reduce final energy consumption,
- what is involved in the construction, reconstruction, and modernization of individual heat sources,
- how to use renewable energy sources to produce heat, what are available technologies in the field of energy,
- how to prepare project documentation,
- what is the process of processing loan applications.

More information: https://www.walcz.pl/index.php/informacje-fundusze-europejskie/210-szkolenie-z-efektywnosci-energetycznej-i-programow-pozyczek

## Information and educational activities of the Energy Regulatory Office
Poland

Within the framework of the educational and informational project, the Polish ERO organized in several regions of Poland a series of meetings and workshops under the title "Almost everything about energy efficiency - children, youth and seniors learn how to save energy", during which the following topics were discussed:

- Using energy economically
- Using household appliances more rationally
- Changing habits concerning use of energy-consuming devices
- More rational use of home heating and hot domestic water
- What is the consumption of electricity by different appliances
- What is energy poverty
- What are the proper ways to keep the hiuse warm

More information:
https://www.ure.gov.pl/pl/urzad/informacje-ogolne/aktualnosci/3502,Szczecin-Katowice-Poznan-Wroclaw-dzialania-informacyjno-edukacyjne-URE-w-regiona.html

## Malopolska in a healthy atmosphere - educational materials
Poland

The LIFE-funded project has produced many educational materials (guides, brochures, posters) on topics such as:

- Anti-smog resolution in practice
- Requirements of the anti-smog resolution
- Clean Air Programme
- "Anti-smog Decalogue"
- "What you can do for clean air"
- "Smog or health"
- "We do not poison our neighbours"
- Social campaign "A thief lives in your house!"
- Social campaign "Smoke from the stove you kill"
- "Saving energy and water"
- Educational materials for schools
- Fireplace inspection instructional video

More information: https://powietrze.malopolska.pl/materialy-edukacyjne/

**The manual "CLEAN ENERGY IS CLEAN ENVIRONMENT"**

As a part of the project entitled "Installation of renewable energy systems in municipalities: Niepołomice, Wieliczka, Skawina and Miechów on public buildings and private houses" a series of manuals for youth and adults was published, which is a supporting material for training in ecological behavior and the use of renewable energy sources.

## 4.2. Consultancy services

## A. General guidelines

As important way to help people affected by energy poverty is to provide a consultation service for residents who need it. Many people struggling with energy poverty do not know how they can reduce their energy consumption so that their financial income will be sufficient to cover their bills and daily needs. Often these people are not aware of any support programs or subsidies that they could benefit from. These programs are often advertised on the internet or television and people with low incomes do not have a computer or even a television at home. In many cases, people who need help do not know who they should approach with such problems, so the creation of a home consultation service is a perfect answer to these problems.

People engaged in such a role should not only have adequate technical knowledge of energy efficiency, energy saving methods, but also of possible support programs and ways to apply for them. Any city, municipality or village can implement such a solution. There are many good practices that prove how much can be achieved by such actions. Obviously, they should be adjusted to the local situation - in some places it might be a good solution to employ a permanent municipal eco-consultant, who can be approached by the citizens, while in a city with other problems it might be a good solution to create information points. In rural areas, perhaps the best solution is to carry out systematic, individual, household consultations with the residents. Each of the solutions has its advantages and disadvantages, but regardless of which one is chosen - each will bring a positive effect. What all of these solutions have in common is the education and soft skills of the energy consultant. When it comes to education, he or she should have a technical background.

Technical knowledge required from the eco-advisor:

- energy efficiency of buildings,
- thermal insulation of buildings,
- heating systems,
- environmental protection,
- air quality,
- energy audits,
- thermovision inspeactions and reading thermovision pictures

Of course, finding the right person who would be absolutely familiar with all the necessary topics is not easy. Therefore, it is worthwhile to conduct additional courses and trainings for such persons - so that they have the most current and appropriate knowledge to fulfill their role. However, in addition to technical knowledge, it is also very important that the eco-consultants are familiar with all the possible support programs, sources of subsidies or loans that can be given for activities in the field of thermomodernization, etc. It is important for them not only to know about all the possibilities, but also to be able to properly assist the inhabitants in preparing applications that will be positively evaluated. They must also be familiar with current legislation - both national and local. In addition to these important aspects, they must have the right soft skills - they must be helpful, be able to explain complex technical issues in simple language, but at the same time they must treat the residents with respect.

The role of the eco-advisor, besides the obvious one of supporting the citizens affected by energy poverty, should also be to organize meetings with the residents or students and to educate all the people living there (this can be done through leaflets, posters, but also through articles in the press or on the Internet).

It is very important not only to help residents struggling with energy poverty, but also to raise awareness among others about this issue. For this purpose, catchy phrases posted in public places can be a very good solution. Some examples are given below:


Source: group work during workshop conducted within the EnPover project.

But back to the pros and cons of each option. A specialist employed in the City Hall and having his/her office there will be easily accessible to all residents. Usually the City Hall buildings are located in the center, which is the easiest to reach. What is more - everybody knows where to look for information concerning a person working there, his/her working hours or office number. City Halls often cooperate with Municipal Social Assistance Centres, therefore an eco-consultant employed on a permanent basis will be able to easily cooperate with other units in order to provide the best possible assistance to the residents. Another advantage of such solution is the access to the actual information - being in close contact with the mayor or the financial department, the eco-advisor will be aware of the financial possibilities that the municipality has to fight against energy poverty. The last, and perhaps the biggest, advantage is that residents will not be ashamed - people suffering from fuel poverty usually live in difficult conditions so they don't want outsiders to see them. They don't have to show their house to externals when they come to the City Hall building.

The solution of creating information points also has similar advantages. Locating such points in different parts of the city will allow to reach many citizens. Knowing the local conditions, it is possible to create such points in poorer neighbourhoods, which cannot be done in the case of an advisor employed by the City Hall, who is permanently assigned to work in the center, where

usually there are service facilities or more wealthy residents live. In the case of information points, people affected by energy poverty should also not feel frightened about coming to consultations because, as mentioned earlier - they do not have to show anyone their home. In both cases, the advantage is also a disadvantage.

An energy efficiency specialist is much more able to help residents when he or she will see their home, heating equipment, wall insulation, or even observe habits that affect energy consumption. Often what residents need is simple advice from the specialist - on how they should properly use the furnace, how to operate the various devices. Such advice is difficult to give in theory - without seeing the equipment in use. Eco-consultant during home visit can also do a thermal examination of the house, check thermal insulation of the building, tightness of doors and windows, or conduct an energy audit of the household. He can also help residents fill out a special sheet on gas or electricity usage (the sheet is attached).


Source: pixabay

## B. Do’s and don’ts

Being there and seeing what equipment the residents have, the eco-advisor can advise on how they can reduce their energy consumption through more rational use. There are several simple and low-cost (or even no-cost) ways to do this.

Examples of eco-advisor's advices for reducing heat consumption and improving thermal comfort:

- removing curtains or furniture that block the heat transfer from the radiators. Covering radiators impedes improper air circulation in the room and reduces efficiency of heating,
- correct setting of thermostatic valves in the rooms, in order to still be able to provide thermal comfort, but also to use less heat,
- properly ventilating rooms to maintain proper air quality,
- cleaning radiators regularly, as the dust on them acts as an insulation,
- properly venting radiators and knowing when it is necessary to do so.

The task of the energy efficiency specialist during an individual home visit is also to advise and show the residents how they can reduce their electricity consumption.

Examples of eco-advisor's advices for reducing electricity consumption:

- switching on the energy-saving mode of electrical appliances,
- unplagging unnecessary appliances that are rarely used,
- unplagging chargers when not in use,
- maximising use of daylight. Moving desks/tables so that they are located as close as possible to windows,
- cleaning and maintaining lamps which, when dirty, significantly reducing light intensity but do not reduce energy consumption,
- using energy-efficient bulbs

The eco-advisor's task is also to help the residents to reduce their water consumption. During the visit, he/she can give residents, for example, aerators, but also check the leak tightness of their installations.

## C. Overview of good practices

There are many good practices that can inspire eco-advisory activities, such as:

## Eco-advisers network in Małopolska Region

Poland

As a part of the LIFE project, a network of Eco-advisers was established in 62 municipalities in Polish region of Małopolska, whose task is to support citizens and municipal authorities in implementing anti-smog activities, namely to:

- provide assistance to residents whishing to apply for funding for the replacement of the heat sources,
- organize meetings with citizens and local leaders,
- organize meetings and competitions in schools and kindergartens,
- carry out local educational activities,
- carry out building inspections with thermal cameras and inspections of furnaces.
- prepare applications for funding for the municipality for investment activities related to air protection.

As a result of this good practice - activities of eco-advisers conducetd in the period from October 2016 to February 2020 - the following results were obtained:

- 330 124 participants of organized events
- 595 869 advices provided to citizens
- 95 816 children participating in workshops and competitions
- 1 064 356 educational materials provided
- 3 360 thermal imaging inspections of buildings
- 10 460 waste and fuel combustion inspections

More information: https://powietrze.malopolska.pl/en/life-project/

## Green Point in Słupsk

Poland

Green point in Słupsk is an educational and information point providing all interested citizens with free advice in the area of environmental protection and energy saving. The citizens can learn there, among others, how to reduce energy consumption by changing light bulbs, how to obtain energy from renewable sources, where to look for funds for replacement of old boilers with more ecological heat sources and how to reduce heating bills.

Green Point's employees participate in condominiums' meetings, reaching citizens with the most important information concerning city's environmental policy and actions. They also co-organise trainings focusing on energy saving, possibilities of using renewable energy sources and segregation of recyclable materials.

During the first four months of the Green Point's operation, its employees reached approx. 2 500 citizens. Their educational work helped in raising citizens environmental awareness, as well as the awareness of municipal institutions, non-governmental organisations, and entrepreneurs. Citizens learned more about practical energy-saving solutions, which generate profits and improve the quality of everyday life. Green Point's activities also support promotion and better understanding of the principles of sustainable development.

**Survey of single-family house owners in Sztum**
Poland

The survey covered owners and families living in single-family houses in specially selected area which includes about 50 houses. Its aim was to collect:

- basic data on buildings in the designated area: information on the number of houses, their condition, type, already made thermal insulation investments,
- basic demographic data on households and their inhabitants (age, number of people in the household, their average income, etc.),
- data about the state of knowledge about available solutions to improve the energy efficiency of homes,
- data about the popularity of using existing solutions to improve the energy efficiency of homes.

Thanks to the survey the city found out that:

- All houses were built before 1990 and most of them before 1945. On average, they are 91 square meters houses.
- All of them are heated by individual heating systems, the vast majority based on coal (80%).
- Respondents rank quite highly their knowledge about energy saving products and solutions - many of them they can name, but more importantly, many of them they use also in their households.

It may not be the best solution in every location to set up a service for consultation with experts - in other circumstances, home visits may be a better solution. But whichever solution we choose, the most important thing is to act - to try to tackle energy poverty.

# D. Supporting material

- Gas and electricity consumption sheets

| Year | Day | Month | Number of days | Gas - consumption | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Meter indication | Consumption [$m^3$] | Consumption [kWh] | Cost | Number of days to account | Daily consumption [$m^3$] | Daily consumption [kWh] | Cost per day |
| 2018 | | January | 31 | | | | | | | | |
| | | February | 28 | | | | | | | | |
| | | March | 31 | | | | | | | | |
| | | April | 30 | | | | | | | | |
| | | May | 31 | | | | | | | | |
| | | June | 30 | | | | | | | | |
| | | July | 31 | | | | | | | | |
| | | August | 31 | | | | | | | | |
| | | September | 30 | | | | | | | | |
| | | October | 31 | | | | | | | | |
| | | November | 30 | | | | | | | | |
| | | December | 31 | | | | | | | | |
| 2019 | | January | 31 | | | | | | | | |
| | | February | 28 | | | | | | | | |
| | | March | 31 | | | | | | | | |
| | | April | 30 | | | | | | | | |
| | | May | 31 | | | | | | | | |
| | | June | 30 | | | | | | | | |
| | | July | 31 | | | | | | | | |
| | | August | 31 | | | | | | | | |
| | | September | 30 | | | | | | | | |
| | | October | 31 | | | | | | | | |
| | | November | 30 | | | | | | | | |
| | | December | 31 | | | | | | | | |
| 2020 | | January | 31 | | | | | | | | |
| | | February | 28 | | | | | | | | |
| | | March | 31 | | | | | | | | |
| | | April | 30 | | | | | | | | |
| | | May | 31 | | | | | | | | |
| | | June | 30 | | | | | | | | |
| | | July | 31 | | | | | | | | |
| | | August | 31 | | | | | | | | |
| | | September | 30 | | | | | | | | |
| | | October | 31 | | | | | | | | |
| | | November | 30 | | | | | | | | |
| | | December | 31 | | | | | | | | |

Source: Guide for saving energy at home, ASSIST 2GETHER

| Year | Day | Month | Number of days | Electricity - consumption | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Meter indication | Consumption [kWh] | Cost | Number of days to account | Daily consumption [kWh] | Cost per day |
| 2018 | | January | 31 | | | | | | |
| | | February | 28 | | | | | | |
| | | March | 31 | | | | | | |
| | | April | 30 | | | | | | |
| | | May | 31 | | | | | | |
| | | June | 30 | | | | | | |
| | | July | 31 | | | | | | |
| | | August | 31 | | | | | | |
| | | September | 30 | | | | | | |
| | | October | 31 | | | | | | |
| | | November | 30 | | | | | | |
| | | December | 31 | | | | | | |
| 2019 | | January | 31 | | | | | | |
| | | February | 28 | | | | | | |
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| 2020 | | January | 31 | | | | | | |
| | | February | 28 | | | | | | |
| | | March | 31 | | | | | | |
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| | | October | 31 | | | | | | |
| | | November | 30 | | | | | | |
| | | December | 31 | | | | | | |

Source: Guide for saving energy at home, ASSIST 2GETHER

## JOB OFFER - ECO-ADVISER

- **Basic requirements:**
  1) meeting the requirements specified in the Local Government Employees Act,
  2) higher education,
  3) minimum 1 year of work experience on a similar position,
  4) knowledge of energy law, environmental protection law, water law.

- **Additional requirements:**
  1) experience in working in the field,
  2) proficiency in the use of Microsoft Office programs,
  3) self-control in conflict situations with citizens,
  4) ability to work in a team.

- **The scope of tasks performed on the position:**
  1) accepting applications for grants for: replacement of heat sources, builiding RES installations,
  2) preparing grant agreements, final accounting of grant applications,
  3) cooperation with law enforcement agencies in matters relating to environmental protection,
  4) updating and reporting of the local Low-Emission Development Programme,
  5) coordinating activities related to installation of RES in the Municipality
  6) entering data into databases e.g. Building Heating Inventory Database, National Database on emissions of greenhouse gases and other substances,
  7) preparation of correspondence, including providing public information on the above mentioned tasks,
  8) carrying out inspections at beneficiaries during the period of execution of projects by the Municipality,
  9) carrying out field inspections, especially in the field of air protection,
  10) performing other tasks ordered by the supervisor.

- **Work and pay conditions:**
  1) working time: full time,
  2) salary established in accordance with the Regulation of the Council of Ministers and the Regulations on salaries for the employees of the Municipal Office,
  3) salary paid on a monthly basis,
  4) work on a computer more than 4 hours a day,
  5) employment after fulfillment of formalities for a period of 6 months, with the possibility of future contract for an indefinite period.

- **Required formal documents:**
  1) curriculum vitae (CV) including the candidate's e-mail address,
  2) photocopies of documents certifying education,
  3) photocopies of documents certifying the work experience,
  4) candidate's declaration of no criminal record,
  5) candidate's declaration that he/she has full legal capacity,
  6) other additional documents confirming qualifications and skills,
  7) a photocopy of a disability certificate - if applicable.

**The CV should include consent to data processing for the purposes of the recruitment process.**
**The required application documents should be submitted by 31 February 2022:**

- in person at the Municipal Office
- by mail to the postal address of the Municipal Office, with the annotation: "**Recruitment for the position of Eco-adviser**".

Candidates will be informed about meeting the formal requirements and about the date of the interviews by e-mail sent to **the e-mail address indicated in the CV.**

## 4.3. Actual energy consumption measurements

## A. General guidelines

### Why is it so important to measure actual energy consumption?

Actual energy consumption is one of the most important indicators of energy poverty, since over and under consumption can be detected at the same time. On the one hand, many energy-poor households consume too much energy e.g. due to the lack of sufficient insulation. On the other hand, many have severe health problems because they consume way below the average and live in colder houses. Therefore energy cosumption data is inevitable for every endavour to design energy poverty related policies on the local, regional and national level. Furthermore, the continuous measurement of actual household energy demands is essential for increased energy consciousness. Repeated measurements can also draw attention to the available energy savings potential and help getting rid of wasteful energy consumption habits e.g. keeping electric appliances in standby mode.

In the case of electricity, the measurement is simple since every household has its own meter. However, heat demand measurements could be more complicated, because lots of different heating fuels are used across Europe e.g. natural gas, district or centralised heating, firewood, pellet, wood chip, oil, coal, lignite, even electricity. The measurements of these fuels can sometimes be simple too – for instance for those consumers who are supplied by natural gas and can also monitor their actual consumption with their own meter. Then these data can be used for further analysis since natural gas almost has the same calorific value.

However, in case of firewood or other solid heating fuels exact data are usually not available and the calorific value could change in a wide range. For instance the calorific value of firewood could fluctuate between ~2,5 - 4,5 kWh/$m^3$ mainly depending on the dryness and the quality of the given firewood.

Therefore, permanent monitoring is needed especially in those households who are experiencing issues in paying their energy bills on time. For those who would like to implement energy retrofitting or change an outdated, inefficient appliance e.g. water heater it is also highly recommended to note regularly their energy consumption. Especially right before and after the implementation of the given energy efficiency measure thus the real energy savings can be easily detected. Furthermore, energy consumption patterns (good and bad habits) and weather fluctuation and its effect on actual household consumption are also traceable.

## How often should energy consumption be measured?

It is recommended to note actual energy consumption as frequently as possible. The scale of frequency can be daily, weekly, (bi)monthly or yearly. Usually (bi)monthly measurement is the most common and convenient for consumers, since energy bills are paid with the same frequency. However, it is recommended to avoid flat-rate (lump-sum) payment. This financial construction reduces energy consciousness in the long run. At first sight, flat-rate seems more comfortable, but it makes regular energy consumption monitoring pointless, which has more drawback than advantages. It is also important to note that many of the energy-poor households cannot afford to pay their actual consumption in winter time since heat demands could be even twenty times higher than during the summer. See figure 1.

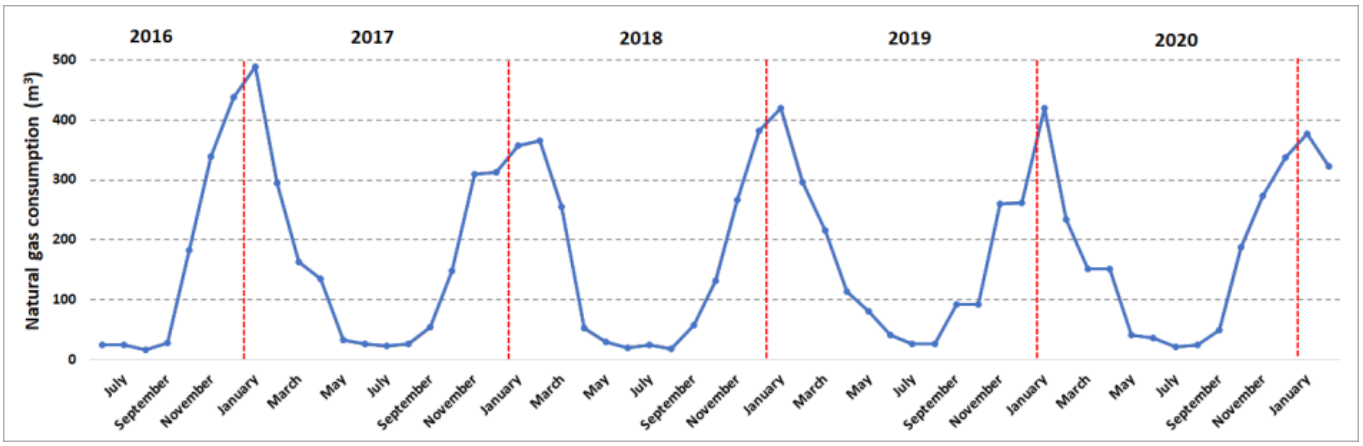


Figure 1. This figure shows the actual natural gas consumption pattern (incl. heating, domestic hot water and cooking) between 2016-2021 of a 120 $m^2$ terraced house with two inhabitants in Budapest.

## How can actual consumption be measured?

The most traditional way of following up on energy consumption is to keep bills. However, keeping these documents does not mean automatically that the members of the given household are taking care of their real energy consumption. Therefore, many energy-conscious consumers take monthly notes about their consumption and energy expenses in a dedicated "energy booklet". It is also recommended to record household energy consumption (bi)monthly on the given energy supplier webpage or via phone.

MS Excel or other spreadsheet software could help in managing household consumptions. With this method, visualization is simple and eye-catching (Figure 1.). However, spreadsheet-based analysis is not a state-of-the-art way to get connected with the issue. The most convenient solution for those who would like IT-based solutions could be e.g. MS Excel or other spreadsheet software.

In the future smart meters will spread rapidly. With a stable internet connection, energy consumption can be measured and recorded constantly. This solution opens up new horizons in energy consumption measurement and it further supports the integration of renewable energy sources (e.g. rooftop PV systems). It also prepares the ground for a flexible pricing, actual demand-based energy market. This innovative solution would be a useful tool to support the fight against energy poverty. However, the extent smart meters can help should not be overestimated. They are indeed useful, however for the most vulnerable strata of society the technology will not work as they often live without internet connection or smart phones.

Actual energy consumption (billing data) is sensitive information. Therefore, for proper data handling strict GDPR management is needed. For instance in Scotland and Denmark, household scale information about heat demands and energy consumption are available, but these are not for the general public. Access to the database is limited, however, the local authorities have a right to use them if it is necessary for local projects or other relevant purposes.

## What are the main benefits of permanent energy consumption measurement?

Tracking the actual energy consumption has several additional benefits:

- Makes consumers energy conscious in the long run;
- Helps discovering hidden leakage or system dysfunction;
- Saves money and reduces GHG emission;
- Helps maintain utility arrears or avoid debt spiral;
- Makes consumption pattern dimensions (e.g. kWh, $m^3$ etc.) more understandable for non-professional consumers;
- Brings energy-saving potential closer to the people;
- Supports energy renovation process from the very first step;
- Makes energy efficiency measures, (bad or good) energy consumption habits and weather fluctuations tangible.

### *Protection of vulnerable consumers and prepayment metering*

With the publication of the Gas and Electricity Directives under the Third Energy Package (TEP) in 2009 all EU Member States were required to introduce the concept of vulnerable customers into national legislation accompanied by a certain set of perks developed by each MS.

"Member States shall take appropriate measures to protect final customers, and shall, in particular, ensure that there are adequate safeguards to protect vulnerable customers. In this context, each Member State shall define the concept of vulnerable customers which may refer to energy poverty and, inter alia, to the prohibition of disconnection of electricity to such customers in critical times. Member States shall ensure that rights and obligations linked to vulnerable customers are applied. In particular, they shall take measures to protect final customers in remote areas.".

While some Member States already had measures in place prior to 2009, as a result of the TEP the number of nationally available benefits quickly grew. Most Member States define vulnerability and provide benefits for recipients of social services and for a range of socio-economic groups.[1]

**Table 1 : CATEGORISATION OF MEMBER STATES' DEFINITIONS OF VULNERABLE CONSUMERS**

| *Definition type* | *Member State (MS)* | *No. of MS by type* |
|---|---|---|
| Receipt of social welfare | BG, CY, DE, DK, EE, FI[1], HR, HU, LT, LU, MT[4], PL, PT, SI[3,6] | 14 |
| Energy affordability (low income / high expenditure) | FR[2], IT, SE | 3 |
| Disability / health | CZ, NL, SK, IE | 4 |
| Range of socio-economic groups | AT, BE, ES, GR, RO, UK[5] | 6 |
| Not available / Under discussion | LV | 1 |

1 Although term not officially recognised; 2 Under definition of energy poverty; 3 Also includes disabled individuals; 4 Also has health and income categorisations; 5 Based on OFGEM definition, not the national fuel poverty definitions; 6 According to the Concept for the protection of consumers fulfilling conditions of energy poverty, new definition and indicators will be based on social (economic) criteria.

The legal framework for vulnerable consumers often provides the right to installing electricity or gas prepayment meters or other measures related to energy consumption measurement. It is worth to make sure that the consumers are acquainted with their legal rights and informed about their opportunities.

In the case of Hungary, vulnerable consumers can apply for the installment of prepayment meters which guard households from disconnection and can ensure a more conscious use of energy. However, they provide no guarantee that vulnerable households will have a decent flow of electricity or gas services, as upping the meters is fully the household's responsibility. In case of shortfall in income or scarce and expensive public transportation households are left without

[1]Pye, Dobbins, S. P. A. D. (2015). Energy poverty and vulnerable consumers in the energy sector across the EU: analysis of policies and measures. Insight Energy. https://ec.europa.eu/energy/sites/ener/files/documents/INSIGHT_E_Energy%20Poverty-Main%20Report.pdf

balance on their devices. As measures regarding consumer protection are developed and controlled nationally, this might be different in other countries. Make sure to check the relevant legal documents and see how these measures are carried out in practise.

**The lesson to be learned is that even small municipalities have the power to assist these households in the following ways:**

**Rural municipalities:**

- Establish local assistance for vulnerable consumers. As the municipality has internet and phone service you can provide visiting hours for vulnerable consumers to come in and assist them — even with just a free computer — in upping their meters online or through the phone.

- Start a bi-weekly or monthly minibus service to the nearest place where upping the prepayment meter is possible in person.

**Municipalities with an extensive amount of disadvantaged households:**

- Use an integrated approach to ensure a better life quality for the citizens. This can be done through an agreement with the local utility provider. The municipality can act as a mediator between households and market based companies coming to an agreement or the establishment of a program advantageous to all parties. For further information see the good practise of the Debt Management Programme at Bag or the Social Solar Power Plant pilot project below.

## Kick-off actual energy measurements campaign

A local residential energy consumption measurement campaign can be a good starting point for bringing together the local community and raising attention for energy consciousness. During the campaign excel templates and booklets can be distributed among attendees, alongside with energy consulting which can support the energy measurements process. Local schools and students should also be involved in these actions since the younger generation can have a great impact on their families in the long run. In order to engage as many households as possible useful rewards can be offered, e.g. among the most active energy-poor households a pilot subsidy program could be launched.

**Key steps for measurements campaign:**

1. Communicate the campaign's idea via local media and social media channels;
2. Engage with local schools, universities, NGOs, utilities and energy supply companies;
3. Organise “warm-up events”e.g. physical or online workshops and forums;
4. Create and distribute excel or booklet templates to increase the efficiency of the campaign;
5. Launch campaign and offer useful awards;
6. Monitor feedbacks and communicate constantly the latest news and milestones during the campaign;
7. Close campaign with a remarkable event;
8. Evaluate the results and the gained database of the campaign;
9. Apply for funds or implement local projects based on the results of the campaign;
10. Repeat the campaign yearly.

## Empower energy poor households to implement energy efficiency measures

Besides household-level, energy consumption can be measured at the appliances level just as well. In order to find out which device consumes the most energy, it is recommended to use consumption meters. This method can give a better picture of the efficiency of the biggest household appliances such as refrigerators, water heaters, washing machines etc. The outdated, unmaintained devices can consume 4-5 times more than the most efficient ones. The appliance measurements may take some weeks or months but in the end, it will be quite obvious which household appliances should be replaced by a new more efficient ones.

It is recommended to start targeted local subsidy programs for energy-poor households, e.g. low interest or interest-free loans. Beneficiaries can use these subsidies to replace their inefficient appliances such as electric water heaters. For instance, the payback time could be less than 2 years if an out-dated water heater is replaced by a state-of-the-art heat pump water heater.

## B. Resources needed

For the implementation of an actual energy measurement campaign/program human and financial resources ,as well as certain equipment, are alway required.

**Needed human resources may consist of:**

- Local project manager who coordinates the whole program;
- Systems administrator who maintains energy consumption database;
- Energy advisors/mentors who make home visits (it could be voluntary e.g. university students or social workers or even the staff of the local authority could be involved);
- Technical staff who maintain the smart or prepaid meters.

**Financial and equipment needs:**

- In case of a broader project, external financial sources may be needed e.g. EU or national level funding;
- Smart meters, prepaid meters, online software may also be needed.

## C. Stakeholders involvement

**In order to kick-off a municipal level energy consumption measurement program it is crucial to engage as many local stakeholders as possible:**

- Local or regional energy supply/utility providers;
- Small or medium sized enterprises;
- (Technical) universities (academic sector); Local
- NGOs and charity organisations; Residential
- communities.

## D. Overview of good practices

**Bükkalja actual residential energy consumption mapping program**
Hungary

Between 2015-2020 an extended rural survey program was carried out by the Department of Environmental and Landscape Geography of ELTE University, Budapest. A custom database was created by implementing surveys that involved more than 2200 households in 31 settlements. The interviewers conducted a door-to-door survey and collected information about at least 10% of the occupied dwellings at the given settlements. A wide range of households were included. The gained database contains comprehensive information about household energy consumption patterns incl. heating, cooking, electricity use; heat demands and actual energy billing data and energy efficiency e.g. insulation, appliances etc. This research could pave the way towards local, regional, national policies or EU funded programs and projects since energy consumption measurements should always be the first step before any energy saving action.

## E. Supporting material

**Tools and methods which could help in identifying vulnerable households**

**Excel questionnaire**

**Tip**: The questionnaire could be converted online as well as e.g. to Google form.

| Pros | Cons |
|---|---|
| Google form can be distributed via social media channels. | Targeting may require additional financial sources and the questionnaire must be very short. |
| Data processing and result visualization is faster. | Without home visits valuable information, details and human interaction are lost. |
| In-person visits are less COVID-19 safe. | The lack of personal contact could decrease reliability. |

**PowerPoor tools:**

- POWER-TARGET
  Target energy poor citizens using a data-driven approach that allows for the identification of energy poor citizens, communities, neighbourhoods or districts.

- POWER-ACT
  Enpower energy poor citizens to understand their energy usage, the benefits associated from implementing energy efficient interventions and from installing renewable energy.

- To learn more visit: http://powerpoor.epu.ntua.gr/powerpoor-toolkit/

## 4.4. Awareness raising and educational campaigns

## A. General guidelines

In the light of previous chapters, it is a huge advantage for settlements to have an up-to-date database on vulnerable households and on those who periodically or permanently face energy poverty. In many cases energy-poor households have a lack of background information on the bases of their problem and information rarely reaches them on what can be done against energy poverty on individual, household, community, or even national level.

Therefore, providing additional information for the target group is inevitable. The most effective way to share vital knowledge is likely a well-structured and organised online and/or offline awareness raising campaign.

Identify key messages and set clear goals at the very beginning containing:

- **the most relevant problems** of the given municipality e.g. relation between energy poverty and air pollution;
- the **possible solution(s)** e.g. cleaner heating options;
- a **community level message** e.g. "energy poverty is a common issue, it can only be solved through common action" etc.

In the process of identifying key issues involve **individuals with various economical background from the local community**. Their hands-on knowledge and experience with their community, built infrastructure and media consumption furthers the effectiveness of the campaign.

Information on energy poverty should be disseminated at local schools as well. It is crucial that the younger generations have correct and relevant knowledge on sustainable energy consumption patterns and habits. Furthermore, practical knowledge and basic theoretical information should be well-balanced e.g. understanding and evaluating energy bills are important and useful skills in real life. In order to increase the energy consciousness of students, thematic days or targeted education campaigns should be organised periodically. It is important to note that besides students, the whole settlement can be educated and engaged via open days and special community events.

## B. How to build up awareness raising and education campaigns

### Identifying main goals, target groups, and the type of the campaign

As a first step, the main goals of the project should be identified. Goals could be diverse and multifaceted such as empowering energy-poor citizens to join or establish local renewable energy-based energy communities. However, it could be as simple as possible e.g. introduce the problem of energy poverty.

After setting crystal clear objectives the second step is to define the local vulnerable groups: low income and single-mother families or elderly, disabled, and sick people etc. This is a crucial step since the type of the campaign and communication channels mostly depend on the target audience. Common types of campaigns: overall energy awareness raising (e.g. EC-LINK Energy Check for Low Income Households), efficient/smart heating focused, efficient/smart electricity consumption focused. Naturally, combinations of different topics are also encouraged. However, at the beginning of the campaign financial and human capacities always should be carefully considered.

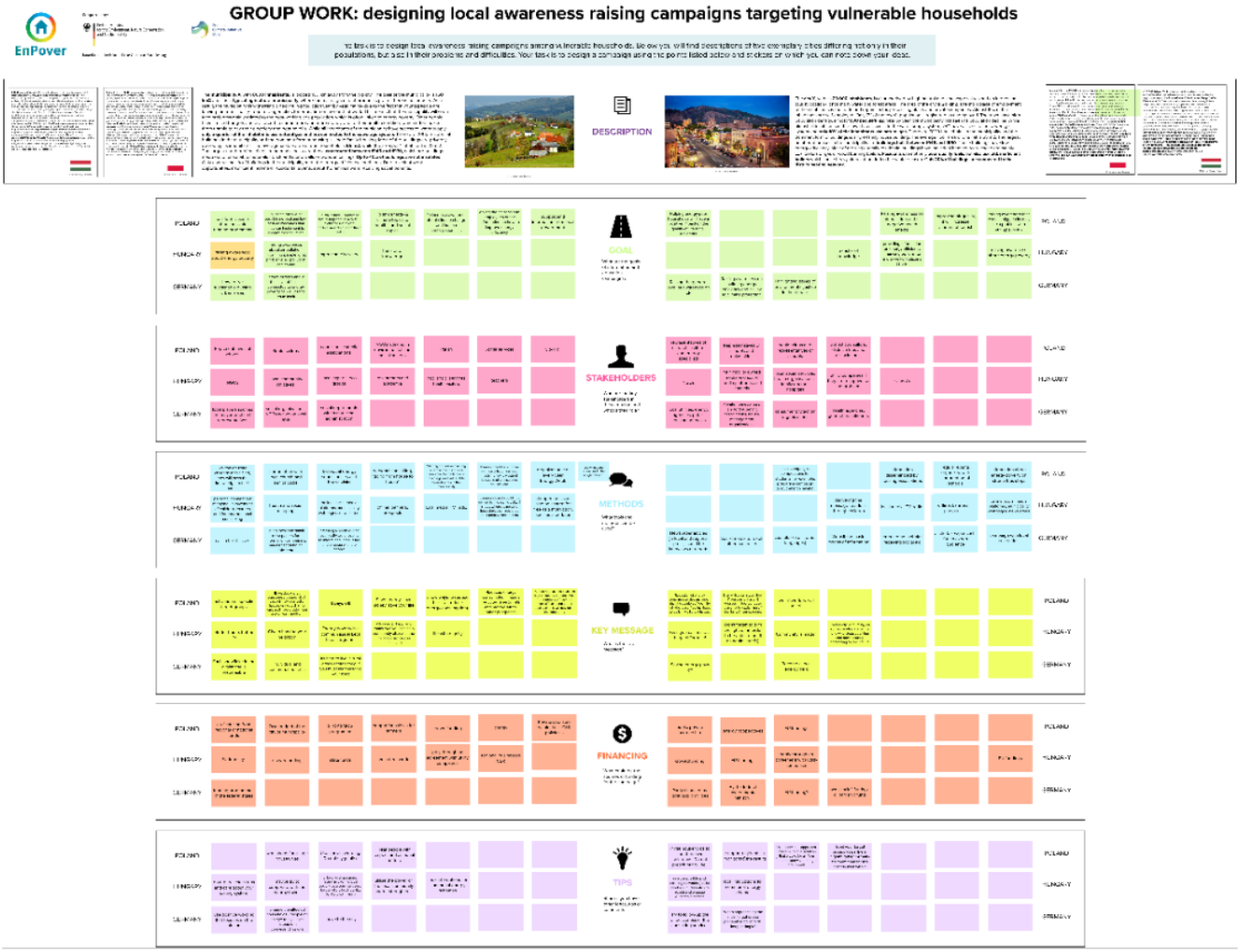


Figure 1. Screenshot, brainstorming exercise in Mural platform (EnPover II. workshop)

## Define relevant communication channels and key messages

In the case of a tailor-made awareness raising/communication campaign the target groups, the main aims and the type of the campaign will determine the communication channels as well. The following channels may be used according to the size and possibilities of the given settlement:

| Communication channel | Platforms | It is highly recommended if, |
|---|---|---|
| Social and online media | facebook, twitter, youtube, tiktok, linkedin, podcasts sharing platforms etc. | the target group contains younger generations, or a pro-active community |
| Printed (conventional media) | flyers, daily, weekly, monthly newspapers, journals | the target group contains elderly citizens, or those who have no stable or permanent internet connection |
| Ad surfaces | billboards, posters, LED panels | the campaign is running in a bigger city with high population density |
| TV, Radio | local, regional, and national | |

## Set up a detailed campaign plan and schedule (timeline/events calendar)

Creating proper content is one of the most difficult parts of any campaign. Luckily, the online library of energy poverty is rapidly increasing thanks to new organisations and initiatives (such as EPOV, Engager Network) and ongoing or ended EU funded project e.g. COMACT, PowerPoor, Step-In etc. If you need inspiration look on these websites:

- http://powerpoor.epu.ntua.gr/powerpoor-toolkit/
- https://comact-project.eu/

General content should be adopted to local circumstances, thus target groups can be engaged easier. It is also recommended to create a series of news or smaller educational articles disseminated on various platform.

## List of possible topics and structure of an awareness raising campaign

1. Setting the scene: introducing the campaign and the general problem of energy poverty
2. Health deterioration, the detrimental social, psychological, and economical effects of energy poverty

3. Available refurbishment schemes, assistance, energy poverty policies and social welfare programs on EU-level, national-level and local-level
4. Energy efficiency refurbishment and deep renovation options
5. Vulnerable consumers, electricity & gas prepayment meters (or detailing any other energy poverty initiative tailored for vulnerable groups)
6. How to properly use wood for heating? - Energy efficiency, health and wood burning appliances
7. Community based initiatives and good practises based on EnPover publications
8. The new wave of energy communities – introducing the concept and trends, positive effects of joining a community

It is also important to consider the proper timing of the campaign. For instance, if the relation of heating-originated air pollution and energy poverty is the key topic of the campaign the optimal time for the kick-off is just before or during the heating season. The length of the campaign mostly depends on the aforementioned factors, however, longer and persistent communication achieves higher impact.

## Carry out campaign activities

According to the available budget, human resources and the target groups a multidimensional campaign can be carried out. Use the communication channels at the same time or build up your campaign step by step.

> It is worth a try to persuade celebrities or well-knonw people (such as mayor) for giving their face for campaigning activities for social media or for posters.

## Monitoring and evaluating the results and feedbacks

After every step of the awareness raising campaign it is highly recommended to track and store the number of followers or reached audience. This will be useful in the evaluation process. Based on the results subsequent campaigns may be altered.

## C. Resources needed

It mainly depends on the details but in general the following resources are needed:

**Human resources:**

- Well trained experts and teachers;
- External and internal communication experts;
- Content writer;
- Media staff e.g. local journalist;

**Financial resources:**

- printing costs;
- advertising and renting costs in social or public media.

It is beneficial and extremely synergetic if EU or other State funded programmes, projects are involved during the campaign.

## D. Stakeholders involvement

- Local elementary and high schools, universities;
- Relevant (experienced) civil organisations;
- Local community leaders, housing providers
- Local media (social media platforms and groups, local journals, radios, TVs etc.)

## E. Overview of good practices

**Here you can find some reference and good example of different types of campaigns,**

- overall energy awareness,
- efficient/smart heating,
- efficient/smart electricity consumption

## 4.5. Competitions, games and edutainment

## A. General guidelines

As is well known, the best motivation for action is a reward or rivalry. Therefore, it is worth considering using various types of games in the fight against energy poverty. Teaching appropriate practices, habits or behaviours should start from an early age, therefore it is a very good solution to conduct regular energy games for the youngest about energy saving. Many families struggling with energy poverty have children who love to participate in all kinds of competitions. The content delivered to the little ones will finally reach the parents as well, so by educating the children - we are educating the whole family. The level of games and competitions should be adjusted to the age of participants - different for children, teenagers, and adults, but also for whole families. Everyone knows that a good competition and the vision of a prize is an appropriate motivator for people in any age.

Starting with the youngest children, there are already many templates for children's activities on energy themes, including suggestions for activities, competitions, games, and trips. During or after the lessons it is good to organise e.g. a quiz on how to save energy, with prizes being ecological gadgets. This will also be a great opportunity to check how much the children have learnt from the lessons. Quizzes can of course also be addressed to older people, who often have even more enthusiasm for this than the children. Some example questions that can be used in the quiz are listed below, but of course it is important to note that they should be adjusted for age:

- How much of a household's energy consumption is generally used for space heating?
- How many % of the EU population are affected by energy poverty?
- What percentage of people experiencing energy poverty live in single-family homes?
- Through which element does most heat escape from the house?
- What is the optimum temperature in the bedroom?
- What are the major causes of energy poverty?

Another possibility is to organise an energy-saving week, during which the children have to do at least one energy-saving activity every day (at home, at kindergarten, or at school), and the next day they will have to present it to their peers. All the activities could be written down and hung up in a visible place, and the children who did the most to reduce energy consumption would be rewarded appropriately. Afterwards it is worth showing how much energy was saved by their actions, e.g. by converting the saved kWh into money. If they want to win - the children will take action to reduce energy consumption not only at school, but also at home, and by knowing how much they saved and how much they could gain by doing such actions regularly, they will certainly continue them in the future.

A competition for the best catchphrase on energy saving can also be held, which will later become the main phrase of a local educational and informational campaign. Such a competition should be held not only among students, who are very creative, but also among adults. Slogans invented by the inhabitants, who know the local problems will be much more persuasive to the wider community.

Nowadays, most young people have good quality cell phones or even professional cameras or videocams. They often make amateur films or are interested in photography. Therefore, it is worth to use their interest by creating competitions for a photo or video that could be used in a campaign on energy poverty. In order to win the competition, they will have to get deeper into the subject, and perhaps locate areas of energy poverty in their own town. Winning artworks, which would show the local problem of poverty, would certainly become a very valuable element of an educational and informational campaign, and would also raise awareness of other inhabitants, who might not have realised before that this problem also affects their city or themselves.

Of course, the residents have many other activities and interests, so it is worth getting to know them and organizing competitions related to their other passions.

Another possibility is to create a so-called energy team at school. The representatives of this team should of course be elected by the other students, and it could be organised as a campaign like the school council elections. The function of the elected people would be to monitor the school's energy consumption - not only to analyse the energy bills, but also to take action to reduce them. Of course, such an attitude and the commitment of students to such a role must be adequately rewarded - this could be in the form of an extra school trip, or extra grades in behaviour. The money saved by the students can be used, for example, for modern school equipment. It is

important, however, that the students should be allowed to choose how to use the money they save, as they will then be more motivated to act in their local community.

Another way to increase citizens' knowledge about energy poverty and related issues in a fun and competitive way is to organize a thematic city game. Participants - young people or whole families would travel to specific places in the city, where they will find tasks. For the correct completion of the tasks they will get a clue on how to get to the next place. In designated places, in addition to the tasks, there might also be interesting information waiting for the participants, e.g. concerning renewable energy sources, energy saving measures or air quality. The tasks that the participants will have to face in each place depend only on creativity and vision of the organizer. In places where the participants will perform the tasks, there may be boards with the tasks' content or there may be an organizer of the game who will give the participants the tasks and instructions on how to get to the next point.

Prizes in all such games and competitions can be, for example:

- room or outdoor thermometers
- bookmarks with energy tips
- glass coasters with interesting facts about saving energy
- eco-friendly bags
- water filter bottles
- aerators
- solar chargers
- energy efficent (LED) light bulbs

In many cases, it is not the fact of getting a prize or a gift for participating in the game that is an incentive, but the possibility of competition with other participants. It can take place between classes at school, or between schools in the city, but it can also go beyond the local area and involve, for example, national or even European rivalry. To further encourage participants to take part in the competition, it is worth organizing study visits to other countries/ cities to learn about good practices. The vision of various types of trips is always a good incentive.

To fight against energy poverty, the city could organise a competition for all the citizens, where the winner would be the household with the highest energy savings. Energy saving competitions are very easy to verify, because all you need to have is your current and past

energy bills (for comparison). However, in order for this competition to have an educational value, it is necessary to provide the inhabitants with information on how they can rationally reduce their energy consumption without lowering their comfort and quality of life. The goal is not to cut off the electricity supply to the inhabitants, but to teach them how to use it properly. The prizes in such a contest for the most active participants could be free energy audits, sets of energy efficient light bulbs, thermostatic valves or aerators.

Such competitions can also be organized at universities, for example. Young people going to bigger cities to study, who often have to pay their energy bills for the first time by themselves, would certainly be willing to take part in all the events that will allow them to reduce their bills. Seeing the effects of their actions, they would later bring these actions to their family homes.

## B. Overview of good practices

The following best practices can also serve as inspiration for creating a game to help reduce energy consumption:

**Energy Neighbourhoods**
European Union

In the first edition, different European municipalities offered their citizens a bet. Groups of private households or institutions formed so-called 'Energy Neighbourhoods' and tried to save as much energy as possible in the six months time of the bet. They were supported by volunteering 'Energy Masters' who were trained during the project and forwarded their knowledge to the households. Each Energy Neighbourhood that saved 8% or more energy in the given time were awarded by the municipality. The best European energy savers were invited to a European prize gala in Brussels.
In the second edition, where Poland took part, the cities challengedtook part, was the second edition of the IEE project Energy Neighborhood. Cities challenged their citizens in two consecutive years to save at least 9% energy in 4 months compared to the previous year. The approach combined a competition on local, national and EU level with measures, such as training for households and municipalities, consumption monitoring and local climate campaigns.
8626 households with 22420 households' members participated in the second edition campaign. On average, energy savings of 8.94% and 12.94% were achieved in the 1st and 2nd campaign year. Compared to the previous years, the neighbourhoods saved 5735 MWh and 2425 t $CO_2$.
More information: https://ec.europa.eu/energy/intelligent/projects/en/projects/en2

**EURONET 50/50 max**
Poland

The aim of the project was to reduce energy consumption in public buildings by implementing an innovative 50/50 methodology in 500 schools and 50 other public buildings from 13 EU countries. The 50/50 methodology involves the active involvement of building users in the process of energy management in buildings and teaches them ecological behaviour through concrete actions. The financial savings achieved are shared equally between the users of the building (e.g. schools) and the entity that pays the energy bills (usually the local authority).
Benefits of implementing the 50/50 methodology:

- raising awareness of energy among students and teachers and changing their behaviour towards rational use of energy and other resources,
- transferring positive patterns of behaviour to the home,
- gaining additional financial resources by the school,
- reduction of energy expenses by the school management,
- improve the local environment and contribute to the global fight against climate change,
- combining learning with fun.

More information: http://www.pnec.org.pl/pl/dzialalnosc/projektycat/50-projekty-zakonczone-w-2016-r/299-oszczdzanie-energii-w-szkoach-i-innych-budynkach-publicznych-poprzez-upowszechnienie-metodologii-5050

The examples above are just a small selection of the inspiration that can be found by searching the relevant sources. All of these ideas can always be modified and adapted to local needs, but it is important to remember that the purpose of these activities is to learn through play, not only education.

## 4.6. Support schemes

This chapter focuses on financial incentives that a municipality can introduce to facilitate implementation of energy efficiency measures or to prevent heating or electricity disconnections in vulnerable households. This includes a short introduction on possible measures, a subchapter on how to implement tools to introduce those measures in energy poor households and a good practice overview on financial tools and umbrella projects.

## A. General overview of financial measures to tackle energy poverty

EU Member States have different kind of financial support mechanisms intended to help certain categories of households to prevent disconnections or providing minimum supply of energy as well as to promote energy efficiency in general. These support mechanisms implemented in national, regional or local level can be divided in three main categories:

Types of financial measures:

| **1. Prevention from disconnection** | **2. Financial interventions on price or income (short-term)** | **3. Support schemes for energy efficiency (long-term)** |
|---|---|---|
| emergency financial support | social tariffs, bill supports, fuel allowances and payments | subsidizing of energy efficiency measures, thermal retrofit, renewable energies |

Mechanisms for disconnection prevention guarantee minimum supply for vulnerable households, impede electricity of gas supply cut offs, can simplify the procedures for the settlement of disputes, or even bring indebted customers into contact with the social services. In many of the EU Member States, there is emergency financial support to households, used for energy expenses in case of disconnection risk.

Most of the EU Member States have financial support mechanisms intended to help vulnerable or low-income households. These measures usually include special social tariffs offering reduced cost of electricity and natural gas for specific groups of vulnerable consumers. Programs that support the payment of energy bills or heating fuel (allowance), which are of short-term or one-time character, are also common measures in many countries.

In countries with high rate of privately rented buildings, specific support especially on local level can be an effective instrument for low-income households enabling them to rent energy efficient housing.

As presented in chapter Step 2, fuel allowance targeted energy poor households is rather a short-time measure while financial instruments supporting energy efficiency measures (thermal retrofit) is more expensive, but also the most effective one.

## B. Types of financial support schemes for energy efficiency (thermal retrofit)

As shown by the project "Our Buildings" (EUKI 2020)[2], there are different types of support schemes for financing thermal retrofit in buildings, which can also be applied to reduce energy poverty:

- Grants or subsidies are the second largest form of public finance. Subsidy schemes can address financial gaps for homeowners or companies. Grants/subsidies usually trigger a high co-financing (50%).
- Tax incentives are the financial schemes that boost the largest financial volumes in both private and public financing. Tax rebates and exemptions can remove financial barriers to energy efficiency investments and make energy saving technologies more beneficial.
- Guarantees are responsibilities by public institutions to help with repayments in case of unforeseen circumstances. A guarantee reduces the risk for the receiver and allows them to attract funds with more favourable conditions (e.g. risk sharing facilities)
- Multiple schemes combine types of financial support into integrated financial solutions. Often subsidies are combined with a loan to reduce high upfront costs for the project owners or debt financing schemes come with a guarantee to reduce risks.

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Measures designed for tackling energy poverty through implementation of energy efficiency measures should focus on issues such as:

- Low-cost energy efficiency and energy saving measures (draft proofing of doors and windows, reflective foils for radiators, thermometers, efficient indoor lighting etc.)
- Replacement of inefficient heating system (with use of renewables when possible)
- Different levels of retrofitting building envelope (focus also on low-cost measures such as insulation for rooftop or ceiling)
- Deep renovation of the buildings whose occupants are vulnerable should be promoted
- Replacement of household appliances ("old for new")
- Subsidies, which are suitable and useful for energy poor households (e.g. high financing rates), should be designed, especially for deep renovations.
- Loans with no interest should be supported, also mainly for deep renovation.
- Subsidies can also support the installation of renewable energy sources (such as photovoltaic panels) which increase the self-sufficiency of the household while reducing the consumption of fossil fuels.

[2] https://www.bpie.eu/publication/financing-energy-renovation-in-buildings-guidance-on-financial-schemes-with-a-focus-on-bulgaria-and-romania/

It is apparent that various types of subsidies are available over EU Member States; however, the crucial challenge remains whether low-income households will also be able to reach for them. One of the typical problems is their repayment, for example, as households at risk of energy poverty often cannot pay in advance the money they have arranged. Vulnerable or low-income households do not have the capital to afford the high investment costs for energy-efficiency measures and available subsidies on national level are often not tailored to this specific target group (such as in Germany). The solution could be that repayment to investment funds will be gradually obtained from the energy savings.

## C. Emerging innovative mechanisms for the financing of energy efficiency measures

Emerging financial models offer the potential to remove some of the long-standing barriers to energy efficiency (upfront costs, split incentives, cost of finance), which most conventional solutions have failed to successfully tackle.

**Examples for emerging (innovative) financial mechanisms:**

- **On-bill financing' models:** energy suppliers finance the investments and are repaid by households through their electricity bills. For further information see
    - RenOnBill Horizon 2020 project (Residential Building Energy Renovations with On-Bill Financing): https://www.renonbill.eu
    - STUNNING Horizon 2020 project: https://renovation-hub.eu/
- **Energy performance contracting (EPC), crowdfunding and leasing**, see E-FIX Horizon 2020 project: http://energyfinancing.eu/
    - Training material on crowdfunding: http://energyfinancing.eu/AmbassadorPlatform/E-FIX_training_materials/c._Crowdfunding_Specialist_Module.pdf
    - Training material on leasing: http://energyfinancing.eu/AmbassadorPlatform/E-FIX_training_materials/d._Leasing_Specialist_Module.pdf
    - Training material on EPC: http://energyfinancing.eu/AmbassadorPlatform/E-FIX_training_materials/e._EPC_Specialist_Module.pdf
- **Property assessed clean energy financing (PACE)** is a mean of financing energy renovations and renewable energy improvements using specific bonds offered by municipal governments to investors.
    - Integrated home renovation program combining affordable financing with people-centric technical assistance, see EuroPACE Horizon 2020 project: https://www.europace2020.eu/
- **Energy efficiency revolving funds**

# D. How to build up support schemes?

## Shaping the plan

Implementing a tool to tackle energy poverty ideally starts with an action plan, as introduced in chapter Step 2. This provides a profound framework of effective measures and sets precise and appropriate energy poverty alleviation targets on the local level. With the information gathered

by following the action plan, the most effective and feasible measures can be identified and formulated into a tool. Additionally the financial resources have to be assessed: which financial resources can be provided by the municipality to design and to implement a tool? Are there any funding programs?

## Stakeholder analysis

As posed in chapter Step 2, building up the stakeholders' support is a key element of successful energy poverty interventions at a municipal level and thus crucial for the successful implementation of a tool. Therefore all stakeholders should be identified in an early phase before getting approvement by the city council.

## Getting the city council's support

In most countries, financial measures have to be approved by the mayor and / or the municipal council. This is the next step after the stakeholder analysis. For a tool to be successful, it should be understandable, easy to use and state its aim and benefits at the first glimpse. This makes it easier to promote to the city council and more useful for the target group.

## Adapting the tool to the target group

A key factor for the successful implementation of a tool is its ease of use. If it's too complex or too elaborated for the target group, it will be difficult to achieve a broad implementation. Therefore it should be designed as easy and as understandable as possible. Additionally, support for filling in the forms should be given by the municipality.

## Finishing and release

In which format the tool can be released is a very individual decision. It depends on the budget, the personal capacities of the municipality, the overall aim, the content of the tool and the target group.

## Advertising the tool

The best designed tool has no impact, if the target group does not know about its existence. There

can be many ways to introduce a tool to the target group and to raise their interest. Which to choose depends on the budget, the quality of the target group and their usual information channels. For successful implementation, the tool has not only to be advertised, but also be simple to understand, simple to use and useful for the target group. Benefits must be stated clearly and it must be as simple as possible for the target group to reach them.

## E. Overview of Good Practices

Here you can find some references and good examples of different types of support schemes or umbrella projects.

**Financial tools**

**"Climate Bonus"**
Germany

This measures provides a premium for energy efficient housing for low-income households. The premium enables households who are on social benefits to rent energy efficient housing. This measure was implemented for e.g. in Bielefeld, Padeborn, Solingen, Berlin.

More information: https://www.energypoverty.eu/measure-policy/climate-premium-bielefeld

**Enercity Härtefonds Hannover**
Germany

This measure provided direct financial support for covering the energy bill and advice to vulnerable households on financial and legal issues concerning the energy bill (the program ended in 2016).

More information: https://www.enercity.de/presse/pressemeldungen/2016/2016-08-26-enercity-haertefonds-fuenfjahresbilanz/index.html

**Programme Habiter Mieux "Better living"**
France

It aims to provide financial support to renovate dwellings of low income households to improve energy efficiency. It includes different types of grants and loans financed by different parts of the government, including the National Housing Agency (Anah), the General Commissariat for Investment, as well as regional and local governments.

More information: https://www.anah.fr/proprietaires/proprietaires-occupants/etre-mieux-chauffe-avec-habiter-mieux-et-maprimerenov/

**Umbrella Projects**

## Energy poverty policy mix of Munich
Germany

Munich serves as a model for other German municipalities with its mix of policy instruments for effectively alleviating energy poverty which includes: 1. hardship fund for households with energy debts, 2. energy consulting of households with energy debts accompanied by socio-educationally consulting, 3. energy consulting for low-income households of the Munich public utility company, 4. free energy advice for low-income households ("Stromspar-Aktiv").

More information:
https://www.muenchen.de/rathaus/Stadtverwaltung/Sozialreferat/Sozialamt/Schuldnerberatung.html

## Electricity and gas fund (Gas- en elektriciteitsfonds Fonds Gaz Electricité) (Combination of financial aid and consultancy)
Belgium

Social services can provide financial aid for paying the electricity and gas bill of households, help to negotiate payments plans and support with improving building insulation and household appliances. The number of cases needing financial support has decreased from 52,184 in 2008 to 28,895 in 2015. Besides bill support, this long-term success is thanks to the additional measures in terms of energy efficiency and energy audits.

More information:
https://www.socialsecurity.be/citizen/de/hilfe-oshz/hilfe-bei-ihren-energiekosten/gas/strom-fonds-energiefonds

## Local Service for Energy Intervention (Service Local d'Intervention pour la Maîtrise de l'Energie (SLIME)
France

Description: SLIME is a programme for low-income households that aims to coordinate actions against energy poverty on a local level. It aims to facilitate the identification of vulnerable households, financially support these households and coordinate between involved organisations. 4,672 households were assisted in the scheme in 2016, investing nearly 2.5 million euros.

More information: http://www.lesslime.fr/

**Electricity help fund (Energy audits, household appliances, energy bill support funded by energy suppliers & NGO)**

Austria

This measure provides households with energy audits to improve energy efficiency, as well as support with the replacement of household appliances. The measure also provides energy bill support for urgent situations. The measure supports 400 to 500 households per year.

More information:
https://www.verbund.com/de-de/ueber-verbund/verantwortung/soziales/stromhilfefonds

**Dos and don'ts**

- **Financial support**, such as deduction of energy bills or support for heating fuel, should not be the first or the only measure as it does not contribute to overall improvement of quality of live and it does not promote rational energy use. It should be at least **combined with energy counselling.** It is highly recommended that cost-effective energy efficiency support tools on national/regional or local level will be implemented in parallel and these options should have priority for low-income households.

- **Minimize bureaucracy** and if necessary **provide free assistance** for filling in documentation and applications for receiving various forms of financial support.

- **When allocating public funds for energy efficiency support schemes:** especially grants should **target vulnerable or low-income households** in those categories of beneficiaries that have very limited resources of their own and limited access to commercial loans. Explore the role of **energy service companies** (ESCOs) and **energy performance contracting**

## F. Other references

- Guidance on financial schemes for energy renovation in buildings: http://bpie.eu/wp-content/uploads/2019/11/EUKI-Financing-energy-renovation-in-buildings_Nov2019.pdf#page=14&zoom=100,92,909
- Following article provides an up-to-date review of conventional and new financing instruments in the EU: https://onlinelibrary.wiley.com/doi/full/10.1002/wene.384

## 4.7. Other tools

In this chapter you will find other good practices that provide inspiration for municipalities to tackle energy poverty. It is worth noting the common denominator of several of them, which is the involvement of the local community. The strength of the community produces many great ideas that address current problems. Thanks to that at a small cost great results can be achieved.

**"Light Up" Project ('Fényhozó' Projekt)**

The 'Light Up' Project is an initiative established by the Fényhozók Foundation. The program is closely tied to the settlement of Baks where many inhabitants are experiencing extreme poverty, roma segregation and often the total absence of electricity. The aim of the program is to provide low cost and sustainable electricity service solution for the most vulnerable. It is done by setting up a one-solar-panel system for the households, thus providing the means of lighting up the home and charging one phone. The creators and participants of the program are locals working volunteerly inter alia setting up the panels, making community-based decisions on the distribution of new systems between members and on discussing their common rules. The solar panel systems are being bought based on crowdfunding, tenders and grants earned by the Foundation and on the financial contributions of the already benefitted. However, the lack of funding is a substantial problem which is even withholding the set-up of the already purchased items. Up to this day 12 households have benefitted from the program. The Foundation is mainly focusing on providing electricity, but they have considered and tried out other small-scale and low-cost approaches combatting energy poverty as well e.g. straw bale insulation.

**Electricity price comparison website**

The Danish regulator operates an electricity price portal, where household consumers can compare electricity prices on the market. The website (www.elpris.dk) makes it easy to review and compare products and electricity prices in the market. It is aimed at residential and business customers with annual electricity consumption of up to 100,000 kWh. Companies (electricity suppliers) that sell electricity to Danish customers are required to publish their current prices on

the website. Therefore, it is also the suppliers' responsibility to update products and prices. The Supply Agency (Forsyningstilsynet) is responsible for the development of Eplis.dk, which is a public, independent body that, among other things, monitors the energy market.

Thanks to this tool, people who are struggling with energy poverty can look for a better deal for themselves. They are not condemned to one operator who can set the prices. The availability of information requires suppliers to keep their offerings competitive, which can drive down energy prices.

**Biobriquette Manufactory**

The Biobriquette Manufactory was launched by Védegylet Association under their Transition Communities Hungary program. Its aim is to provide families in need with handmade briquettes and to form a strong community of the participants. Also, to partially sell their product and reinvest the profit into the manufactory. This project came about through community involvement, collaborative conversations, and the exchange of ideas. The inhabitants themselves produce the biobricket, working together and strengthening social bonds. The activation of elderly and unemployed people is also a great benefit. Energy-poor families not only get the fuel they need to heat their homes but are also involved in the local community.

**Community firewood preparatory event**

Each fall a group of men from Máriahalom gathered to chop (prepare) firewood for elderly women (widows) who don't have enough money and stamina to do this exhausting work. Thus, firewood could dry faster and can be fired more efficiently during the winter season. It is a direct action to help another person. It is a simple way to ensure that a person suffering from energy poverty for reasons beyond their control will survive the winter in the warmth of their home. It is also worth mentioning the social benefit, as through joint action a close-knit community is created to help each other.

**Lastbegrenzung statt Sperre - Pilotprojekt zur Bekämpfung von Energiearmut im Stadtteil Köln-Meschenich**

This measure provided households with smart meters that allowed the power supply to be reduced to 1000 W in case of non-payment, instead of disconnection. Meters were installed in 660 households. Households appreciated the option to have the power supply limited instead of being disconnected. Home disconnection is also disadvantageous to the energy supplier as it

not only loses revenue in the form of bill payment but also incurs costs related to the technical side of grid disconnection. Therefore, this solution was mutually beneficial. The residents who experienced energy poverty had energy for basic needs, they paid less for energy because they used less of it. And the energy supplier had a steady income and did not bear the costs associated with the disconnection of the household.

**Community based biomass briquette production**

The Roma community at Baks suffers from several environmental and social injustices. They have no running water, adequate sewage, or accessible and affordable heating options. Therefore, this community in the village of Bag started producing their own eco heating source - biomass briquettes from feedstock, donated by a local cooperative, to tackle both access to energy and energy poverty. This decentralized community-based bioenergy model was a cost effective, environmentally friendly solution for the community. The briquette's high-burning efficiency and complete combustion minimized both indoor air pollution and illegal logging in the area, and also prevented the burning of harmful materials. The project was inspired by a pilot project conducted by the Real Pearl Foundation from 2011 in Told village (HU). The project started with 25 households (or 4 brigades of 22 people), who produced 1,600 briquettes, which were distributed amongst 15 families. This quantity was produced for one working month (due to unfavourable weather conditions). Approximately 1000-1200 briquettes were needed monthly by each household. Approximately 900-1000 briquettes could be produced for 5 hours with an efficient pressing machine and effective teamwork. In 2014, the community already possessed 2 pressing machines, a dryer, and a paper-mashing machine.

# STEP 5

# Monitoring households performance

## A. General guidelines

Monitoring and evaluation of the effects of projects aimed at reducing energy poverty is an important element of the fight against this phenomenon. This allows for possible corrections of the applied practices in order to improve their effectiveness. Monitoring also has a social dimension, as the achievement of positive results motivates the beneficiaries to continue with their behaviour. It is also the best promotional tool to encourage other citizens to get involved in different actions against energy poverty.

**Monitoring Objectives:**

- Make adjustments to the venture, making the product more relevant to the recipient.
- Increase the recipient's motivation to continue participating.
- Encourage other potential target audiences to participate.

**How can household performance monitoring be conducted?**

Appropriate preparation of the monitoring phase should be considered already at the project planning stage. It is important to adapt this tool to the scale of the program. An important element is also providing the personnel responsible for carrying out such an operation. This person (or team of people if the scale of the project dictates) should be in regular contact with program participants. This can be accomplished by visiting homes that are included in the program, consulting with residents, and collecting data and feedback related to the project. What is important is the level of trust that is created between the residents and the person assigned to this task. If it is high, the cooperation will bring measurable benefits, but if it is not, communication will be very difficult.

**Types of data to be monitored**

There are two types of data that are worth monitoring. These are technical data such as electricity consumption, heat consumption, room temperature, humidity, and electricity, heat, gas and water bills etc. The second type of data are those related to the resident's living comfort: well-being,

health, or thermal comfort. While the acquisition of the first ones in some cases is possible without the involvement of the people engaged in the project, the second type of data requires direct interaction with household residents.

**Monitoring methods**

There are several ways to conduct household performance monitoring. These range from using professional electronic systems to conducting periodic surveys of beneficiaries. A brief description of these measures, including the advantages and disadvantages of each, is presented below.

*Smart metering* – an electronic system that can be used to measure energy consumption with more information than a conventional meter and to send and receive data using electronic communication. The disadvantage of this solution is the high cost associated with the purchase of the equipment itself, but also of specialized software for monitoring energy consumption. The advantage is the complexity of this solution, continuous data transmission also allows for quick reaction in emergency situations.

*Conventional energy meters* – These are devices installed by the energy supplier after completion of the connection construction, which are used to measure the amount of flowing energy of different types. These are the basic devices used for billing between the supplier and the customer. Their use for monitoring includes cyclic reporting of the value of consumed energy, which allows to determine the trend of energy consumption. The advantage of this solution is the low cost of monitoring (if the resident is obliged to do it, higher if it needs to be done by a delegated person). The disadvantage is the long period of data collection.

*Surveying* - is a way to obtain a large amount of data, both technical and related to the living comfort of the resident in a relatively short time. It can be carried out by means of self-completion of the survey questionnaire with or without the presence of an interviewer. The disadvantage of this solution is the high organizational effort required to prepare the survey and to conduct it. However, the advantage is a large amount of data that can be obtained directly from the resident. A sample survey structure is shown below:

**Structure of the monitoring survey:**

- Date and place of the survey
- Personal details of the person completing the survey
- Type of good practice implemented
- Resident's opinion about the good practice
- Savings achieved by the implementation of the good practice
- Change in residential comfort as a result of implementing a good practice
- Resident's ideas on how to improve the good practice

*Obtaining data from third parties* - it is also possible to collect data that has already been collected in connection with other third-party work. For example, energy suppliers have in their database information about energy consumption and the amount of charges that have been billed. It is also advisable to involve municipal units, such as the Municipal Social Welfare Centre, as they are often in regular contact with people affected by fuel poverty. They have the possibility to get the information directly from the source.

**Data evaluation methods – short-term, long-term**

Gathering data is half the success of the monitoring phase, the other half is compiling the data so that good practice can be evaluated. The evaluation of good practice outcomes can be divided into short term and long term depending on the timing of the results. The following are examples of expected outcomes:

| Short-term results | Long-term results |
|---|---|
| • reducing energy consumption<br>• reduction of energy charges<br>• ensuring the right temperature in the building<br>• ensuring appropriate air quality in the home<br>• improving the psychological well-being of residents | • improving the economic condition of the household<br>• improving health condition for residents |

A good way to evaluate the project is to prepare a final report, which would include a summary of the activities undertaken in the project. It might also be valuable to prepare charts, tables and graphs showing how the changes have improved the life of the inhabitants and reduced the problem of energy poverty in the municipality. Such a report is a very useful document, which can be presented both as a summary of the project and as promotional material. It will help convince undecided residents, who - influenced by the example of their neighbour - will be encouraged to take part in a similar undertaking.

**How to ensure that the change is sustainable?**

Achieving satisfactory results is not the last step where a project should end. It is important to ensure the sustainability of the changes that have been initiated. It is important to ensure constant communication between those responsible for monitoring and the residents. Thanks to this the person involved in the project will be constantly motivated to continuous work. It is also possible to schedule periodic data collection, which will allow you to monitor whether the results achieved have been lost. However, the comfort of the resident should be considered, as too frequent imposition of data collection tasks may cause lack of cooperation from his/her side. After the project is finished, it is important to ensure the possibility of permanent access to the collected data and possible further work on the project.

## B. How to start monitoring household performance in the municipality

To start monitoring the results of good practices in the municipality, it is necessary to collect information about energy-poor inhabitants who take part in actions against energy poverty. This data should be easily available because most of these actions are organized together with the municipality. Then, it is necessary to ensure that adequate human and monetary resources will be provided for the monitoring. You can also use already existing municipal units such as the municipal energy manager, environmental protection department, etc. It is necessary to prepare a plan of action including contact with the inhabitants, collection of data, elaboration of results.

Once the groundwork has been prepared, it is time to 'go out into the field', i.e. to get to know the people who are affected by energy poverty. Obtain information on the type of good practice they have participated in and any data you may need to monitor.

Avoid overburdening residents with numerous forms, reports, surveys. This would result in less willingness to cooperate. It is important to listen to residents, their opinions on the practice.

## C. Overwiew of good practices

### Low-Emission Limitation Programme (co-financing replacement of heat sources)

Bielsko Biała, Poland

LELP is a subsidy programme for the replacement of old coal-fired boilers or cookers with the new, ecological heat sources (e.g. condensing and gas and oil-fired boilers or cookers). Originally, the programme foreseen replacement of 150 furnaces per year, but to the great interest, the number has been increased to 450 furnaces.

Since 2007, 2414 coal-fired boilers have been replaced, reducing CO2 emissions by 9712 tonnes per year. This has also had a positive impact on the installation market. It has increased citizens' confidence in the municipal authorities, as evidenced by the continuing interest in the programme.

### „Green light" Slupsk

Poland

The City of Slupsk has started cooperation with the Ikea company. As part of this cooperation, the company handed over 5000 energy-saving light bulbs to families in exchange for the possibility of monitoring the energy saved thanks to these light bulbs.

As a result, 5 000 families have received energy efficient light bulbs, which has had a positive impact on their financial capacity by reducing their energy bills.

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