POWERPOOR

Empowering Energy Poor Citizens through Joint Energy Initiatives

D5.9 EU Policy Recommendations & National Roadmaps to Mitigate Energy Poverty

Working on the ground with energy-poor households and policymakers on mitigating energy poverty levels.

December 2022

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Work Package 5:
Impact analysis, exploitation, replication and recommendations

Deliverale 5.9:
EU Policy Recommendations & National Roadmaps to Mitigate Energy Poverty

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1. Introduction

The purpose of this deliverable is to showcase the eight national energy poverty mitigation roadmaps developed by partners of the POWERPOOR project. On an EU level energy poverty is addressed on multiple scales and initiatives. It is acknowledged in the European Green Deal, the REPowerEU Plan and is a fundamental part of the Renovation Wave as well as the Clean Energy for all Europeans Package. The exchange of best practices and lessons learnt among Member States is another key priority for the European Commission and it is with this in mind that the POWERPOOR national roadmaps have been created. Following an extensive co-creation process across eight national contexts and stakeholder-liaison groups (SLGs), the roadmaps' main output consists of a list of priority actions which should be carried out within the Member States in order to alleviate energy poverty effectively according to experience gained and lessons learnt from the POWERPOOR approach. The outcome of the roadmaps comes at an opportune moment as the EU Social Climate Fund (SCF) is currently being discussed and changes to the European energy market design are in sight. As part of the SCF, it is foreseen for Member States to prepare and submit a Social Climate Plan together with the update of their National Energy and Climate Plans (NECPs). These plans need to contain concrete measures to support vulnerable households, vulnerable micro-enterprises and vulnerable transport users through temporary direct income support and through measures and investments intended to increase energy efficiency of buildings, decarbonisation of heating and cooling of buildings, including the integration of energy from renewable sources, and granting improved access to zero- and low emission mobility and transport. It is recommended that the EU and its Member States take note of the actions co-created in the eight national energy poverty mitigation roadmaps and consider incorporating them in their Social Climate Plans and other relevant policies. The roadmaps can also serve as guidance for the EU`s recently established Energy Poverty and Vulnerable Consumers Coordination Group as well as the EU Energy Poverty Advisory Hub (EPAH).

This document first introduces the template which has been used by partners to co-create the national roadmaps with their SLGs. This part will also introduce the methodology and present the roadmaps as a circular approach which encourages (and facilitates) future uptake of the roadmaps and their actions beyond POWERPOOR`s lifetime. A reflection on this overall process is presented.

The next section will present an overview and classification of the main actions defined in the roadmaps.

This is then followed by reflections on the policy implications of the national actions for the EU level.

The remainder of the document presents the eight national roadmaps in their entirety. The roadmaps will also be made available as standalone pdf documents separately from this deliverable and can be accessed via the POWERPOOR website. In addition, dedicated communication material will be produced in order to disseminate the roadmaps (especially their actions), in a more distilled format, to a wider audience.

2. National Roadmaps Template

Introduction

In the following subsections the need for an energy poverty mitigation roadmap within the POWERPOOR project is explained along with the methodology employed to draft the policy roadmaps on a national level. The template presenting the methodology that was provided to the national partners to enable them to create them is presented along with what a description of what was expected in each step. The methodology employed is mostly based on the Climate KIC Visual Toolbox for System Innovation 2020 and has been customised accordingly to accommodate the POWERPOOR project needs. A common methodology was used among all partners to develop the roadmaps ensuring that all the required aspects were looked into in the national country level.

Why set a national energy poverty mitigation roadmap?

In the POWERPOOR project, partners are actively assessing causes of energy poverty and suggest behavioural changes as well as the uptake of collective energy actions to mitigate this problem. A highly diverse network of Energy Supporters and Mentors has been trained, certified, and is being engaged to further support energy poor households to implement solutions ranging from behavioural changes and low-cost interventions to large scale energy efficiency interventions and the uptake of renewable energy sources leveraging innovative financing schemes. The project has also set up Local Energy Poverty Alleviation Offices in engaged municipalities serving as a one stop shop of information in mitigating energy poverty leveraging the POWERPOOR approach. POWERPOOR strives to trigger high-impact change, not only on the local and regional level, but also on the national and European level. Such a multi-level governance approach will result in long-lasting impact and coordination between local needs and national (e.g., National Energy and Climate Plans) and supra-national enabling frameworks.

The aim of the national roadmaps is then to build on current project activities and to enable the application of the POWERPOOR approach to promote integrated energy poverty mitigation policies across all regions and cities within the pilot countries. This roadmap template is a synthesis exercise based on several outputs of the Work Packages and is to be used by the national project partners and the Energy Supporters & Mentors during the last year of the project and beyond its lifetime (also possibly to be incorporated into future Horizon projects).

Next to the project national partners, stakeholders out of the network of Energy Supporters and Mentors, especially those in the National Liaison Groups, should be invited, to leverage the outcomes of the national roadmaps and take the process forward. This work will result in lessons-learned, which, in turn, generates policy

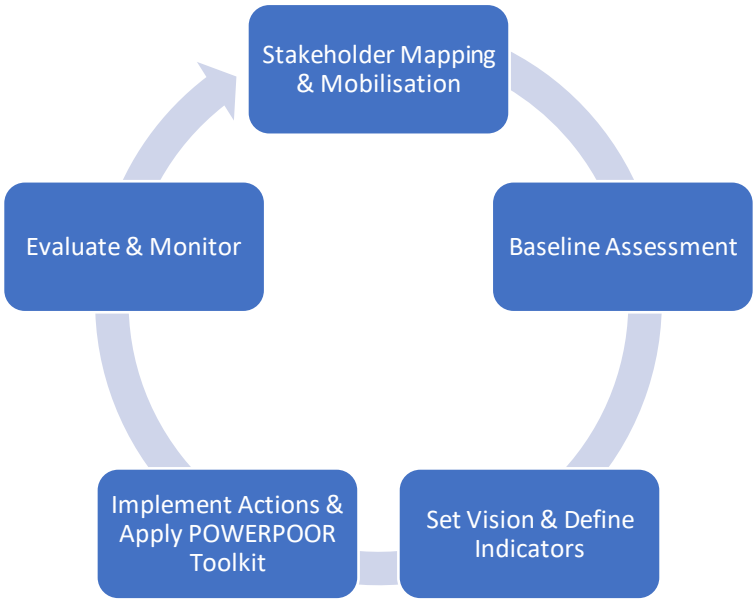
recommendations on how the national regulatory / incentive framework should be adapted to mitigate energy poverty in the first place.

What is the methodology for the national roadmaps?

The development and adoption of the national roadmap is subdivided into two phases, each encompassing specific steps on an integrated management cycle (adapted from ICLEI Green Climate Cities Programme). The cycle has been chosen as a basis for the roadmap since it promotes a holistic and future-proof approach to policy making.

Phase 1 takes place until the end of the POWERPOOR project and includes steps which shall be carried out by partners and Energy Supporters and Mentors until then. Phase 2 takes place within one year after the project ends, or on any other timeline decided by the partners and stakeholders. Once the cycle has been completed a first time, the process can be repeated (and could potentially serve as a basis for future projects).

Figure 1 Roadmap Methodology



Adapted from ICLEI Green Climate Cities Handbook 2016

National Roadmap Development

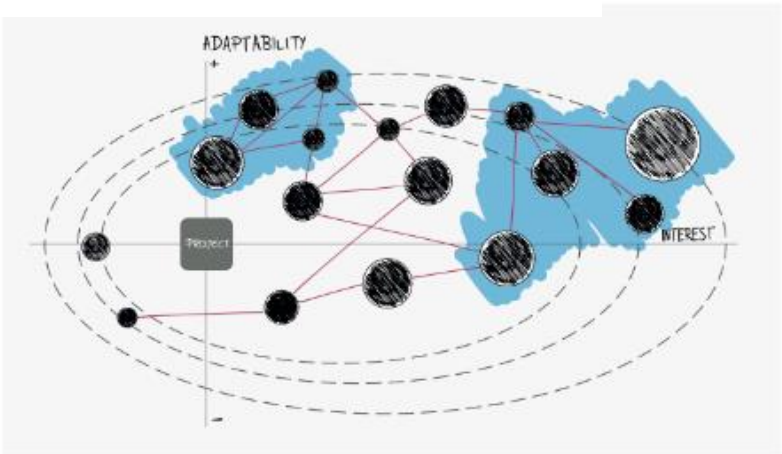
Phase 1

The following three steps correspond largely to the activities carried out within the POWERPOOR project and rely strongly on the findings of Deliverable 4.2 "Baseline Assessment Report" updated where needed. They will form the basis for the national roadmaps and for the subsequent steps of Phase 2.

Step 1: Stakeholder Mapping, Commitment & Mobilization

As part of D4.1, project partners have carried out an initial assessment of stakeholders and have created an overview of the expectations the different stakeholders have towards the project as well as their influence and level of expertise. Some of the stakeholders are also part of the National Stakeholder Liaison Groups. As part of the roadmapping process, it becomes important to identify the relative importance of particular stakeholder groups vis-a-vis energy poverty mitigation and to identify how flexible stakeholders are to adapt their everyday (business) practices and what kind of networks exist between them. The stakeholder universe methodology, as presented in Module 4 was used to depict this analysis.

Figure 2 Stakeholder Universe



Adapted from Climate KIC Visual Toolbox for System Innovation 2020

This exercise should be done together during the stakeholder consultations and is aimed at understanding stakeholder relations, to identify possible disconnection, flows of knowledge/resources and power. "Tackling energy poverty" is the main star, stakeholders with the highest interest (to mitigate energy poverty), are closer to it. Flexible stakeholders are placed above the x-axis, non-flexible stakeholders beneath. Stakeholders placed closer to each other have a closer working relationship. Once this

is mapped out, connect stakeholder to depict fluxes of resources, money or others. Spot potential clusters of interest and identity as well as critical stakeholders, which link clusters and act as "gatekeepers" or knowledge brokers. Then analyze the network.

In preparing the template for use during a workshop, consider pre-arranging post-its for previously identified stakeholders and make suggestions on where to place them based on earlier analysis done in D4.1 During the workshop, together with the participants, add new stakeholders, or consider where to place already identified ones on the stakeholder universe canvas.

Take a picture of the co-created stakeholder universe and include it in this roadmap.

Please include the picture here and provide an analysis below:

Once the most important stakeholders have been identified as a core group, they need to be mobilised and their commitment to this national roadmap drafting exercise needs to be secured. The way the commitment is secured is up to the project partners. One way to do this could be to already include mention of the roadmap development process as part of the Memorandum of Understandings (MoUs) which are signed as part of the stakeholder liaison groups. Alternatively, consider a simple joint statement communicated through project partner channels following the stakeholder consultation for this national roadmap.

Step 2: Baseline Assessment Revision

The state of play / baseline for what concerns energy poverty in the overall country has already been analysed at the beginning of the project and captured in D4.2. As part of the roadmap process, it is recommended to revaluate the baseline parameters (subject to available capacities of course) to see if any changes have occurred since the last baseline assessment. The baseline assessment should then be presented during the meeting with the stakeholders of the National Liaison Group. Key policy areas to be, at least, presented as part of the baseline assessment are the following. Consider how energy poverty mitigation is addressed in the following areas and fill out the table below.

Table 1 Template Baseline Assessment Revision

National Energy and Climate Plans (NECPs)	
The building sector - renovation efforts	
Social care	
Policy to promote community-ownership of energy	
Policy to promote (collective) finance / crowdfunding	
The energy market (e.g. social tariffs / tax incentives)	
Consumer protection	
SECAPs	

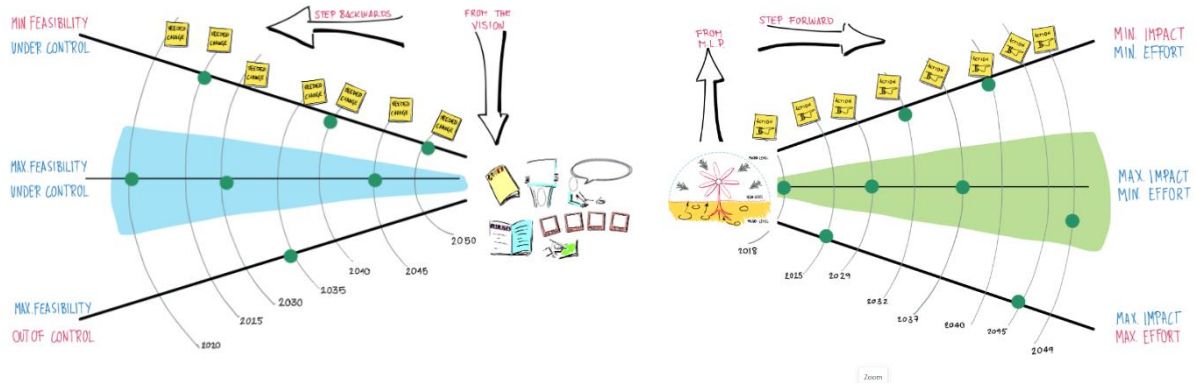
Consider also how this POWERPOOR roadmap might align with potentially existing national energy poverty mitigation roadmaps and how elements of it can be integrated into this template. To enable integration, try to involve stakeholders responsible for drafting the, potentially, already existing national roadmap and consider including results from POWERPOOR sister projects where relevant. Additionally, prepare a broad assessment of how energy poverty mitigation is addressed in local climate & energy / sustainability plans (e.g., SECAPs). The results from D5.4 "Report on actions for energy-poor citizens in SECAPs" can also be used.

Step 3: Set Vision, envision Actions and define Indicators

Now that the stakeholders have been gathered, committed and the national regulatory context reassessed, it is time to foster a common understanding of what alleviating energy poverty actually means for the different stakeholder groups. During the stakeholder consultation, a concrete vision for energy poverty mitigation should be created. The future radar methodology lends itself well for this purpose. Discussions on the possible actions could take place based on a common reference scenario (the vision).

"We are in 2030, thanks to the adoption of these measures and the POWERPOOR approach, energy poverty in our country has been reduced by XXXXXt".

Figure 3 Future Radar



Adapted from [Climate KIC Visual Toolbox for System Innovation 2020]

1. Move from the vision to the present time and envision what changes were necessary to achieve it.
2. Evaluate the feasibility of those changes as well as if you can control that change
3. Now move from the present and identify concrete actions which can lead to the changes
4. Evaluate the impact of those actions and come up with the main line of actions as inputs into a plan on how to mitigate energy poverty long-term.

By applying this tool, you can plan policy actions equipped with a global overview of the milestones to achieve, coupled with their feasibility and the influence you can put on them to happen. The second "cone" will present a detailed plan of actions to implement to achieve the changes envisaged in the first "cone". Be as specific as possible when it comes to assigning dates. Note that both changes and concrete actions can take place

on either governance level. In the table below, indicate your co-created actions from the second “cone”.

Take a picture of the two “cones” and include it in the roadmap.

Please include the pictures here and provide an analysis below:

In the following table, please include action-specific indicators:

Table 2 Template Action-Specific Indicators

Policy Sector	**Actions to be implemented**	**By when?**	**By whom?**
Social care	Regulation to co-finance the electricity cost of energy poor households	2024	Ministry of Social Affairs
Buildings	100% grant support to homeowner’s associations for energy renovation of multi-family buildings in social housing developments	2023	Ministry of Energy

Note: Indicative examples

Phase 2

The previous first three steps of the management cycle laid out the basis for the national roadmaps. The content of those steps will have been discussed during various stakeholder consultations. The results will inform the next two steps which take place within one year following the end of POWERPOOR (or any other timeline decided upon during stakeholder consultations). Before these take place, however, it is important that the previous steps have been completed thoroughly and that a proper consultation process has taken place. This is important since any further actions rely on the commitment of the members in the National Stakeholder Liaison Groups.

Step 4: Implement Actions and apply POWERPOOR Toolkit

This is where the concrete actions, defined previously, are implemented according to the established timeline. For each action, create a plan and highlight, at least, the following elements.

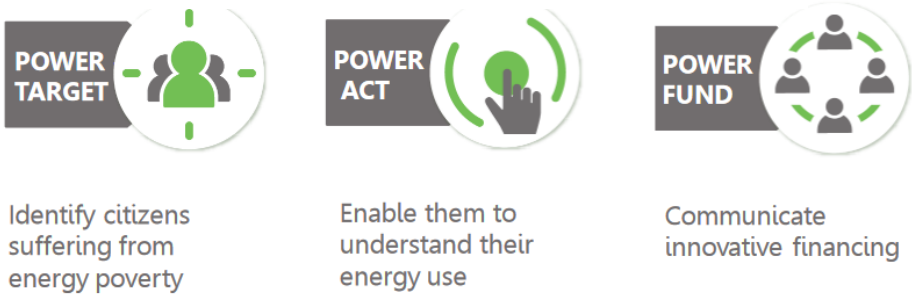
Please fill out ***one table per individual action***:

Table 3 Template Action Elements

Action	
The responsible entity and leading person	
The target group for the action	
Action design	
Scheduling	
Budget	
Drivers	
Barriers	

The POWERPOOR toolkit is incremental to the implementation of the individual actions and should be used actively by whichever stakeholder (e.g., municipality or POWERPOOR partner) has been identified, in the previous steps, as being responsible for implementation.

Figure 4 POWERPOOR Toolkit



Step 5: Monitor & Evaluate

One year after completion of the POWERPOOR project (or any other timeframe decided upon during the stakeholder consultations), the first monitoring & evaluation process should take place to see whether the roadmap's actions, and ultimately its vision, are being met. The exact indicators to be reviewed will depend on which ones have been chosen in Step 2.

Please fill out this table:

Table 4 Template Action-Specific Indicators

Policy Area	**Action**	**Indicator**	**Target (date depending on table 2)**	**Target achieved?**
Social Care	Regulation to co-finance the electricity cost of energy poor households, identified with the support POWERTARGET Tool	Arrears on utility bills % of population /per year	5%	YES/NO
Buildings	100% grant support to homeowner's associations for energy renovation of multi-family buildings in social housing	Households unable to keep home adequately warm /per year	7%	YES/NO

In the following table, please indicate progress in relation to general energy poverty indicators provided by the EU Energy Poverty Advisory Hub.

Table 5 Template General Energy Poverty Indicators

Indicator	Baseline (2022)	Target and Date (Vision)	Target achieved?
Inability to keep home adequately warm			YES/NO (further details)
High share of energy expenditure in income			
Arrears on utility bills			
At Risk of Poverty or Social Exclusion			
Population living in dwelling with presence of leak, damp and rot			
Dwellings with energy label A			
Excess winter mortality/deaths			
Population living in dwellings comfortable warm in winter time			
Population living in dwellings comfortable cool in summer time			
Population living in dwellings equipped with heating facilities			
Population living in dwellings equipped with air conditioning	3,8%		

Recommendations on how to implement the national roadmap

The above process will have resulted in a national roadmap which has been co-created with a diverse group of stakeholders from the POWERPOOR National Stakeholder Liaison Groups. Following the national policy dialogues and consultations, partners will reflect on the roadmap drafting process and can suggest additional recommendations to specific stakeholder groups on HOW the above-listed actions can be implemented. Recommendations should be aimed at the following groups and be included below:

For Sub-National Governments

1.
2.
3.
4.

For National Governments

1.
2.
3.
4.

For Civil Society

1.
2.
3.
4.

For The Private Sector

1.
2.
3.

3. Reflections on the Roadmaps Co-Creation Process

In the following section, we present a few lessons and reflections on the overall experience in coordinating and facilitating the co-creation of eight national roadmaps across multiple different national contexts.

1. It was rewarding to see the multitude of different stakeholders coming together to co-create the roadmaps using innovative discussion ad co-creation formats. Tackling energy poverty requires input from many different angles and across sectors. The POWERPOOR project, through this exercise, allowed the roadmaps to hold high credibility given the diverse background and ownership of participants.

2. The development of the roadmaps has been a challenging experience for the POWERPOOR partners, especially due to the need to bring together stakeholders in person (without financial compensation). While most partners carried out their workshops in person, some opted for an online approach. This was done to allow persons to participate who would otherwise not have been able to join. Generally, it can be observed that in-person workshops proved to allow for a more intense interaction, but results were produced regardless of the chosen format. Another key factor was the outbreak of the war in Ukraine and the consequent rise in energy prices. This meant that several stakeholders saw themselves having to face pressing issues. At the same time, the overall situation showed again how urgent and timely the development of the national roadmaps mitigating energy poverty was.

3. The use of systems thinking and climate innovation tools (stakeholder universe and future radar) was a new experience for the POWERPOOR partners, but everyone was able to adopt and apply them to their local contexts. The authors would like to thank EIT Climate-KIC for making their Visual Toolbox for Systems Innovation available. It has been at the core of the co-creation process for the national roadmaps. The exact way in which the tools were applied differs a little between countries. Given differences in both regulatory contexts and stakeholder's affinity with modern co-creation methods, such differences are to be expected and a reflection of the fact that, ultimately, this process relied heavily on working with and managing interactions with and between people from different backgrounds (and different levels of expectations).

4. The development of the roadmaps coincided with very interesting developments on the energy poverty mitigation front in the different countries. This means that the roadmap development process has been able to influence policy considerations (e.g., such as the creation of National Energy Poverty Mitigation

Strategies on a ministerial level). Since the roadmap's methodology has been developed in a way which facilitates their future uptake and updating, additional work is required to ensure that the roadmaps remain a cornerstone for the further expansion of energy poverty mitigation measures in the eight countries.

4. Cross-referencing of Roadmap Actions

Partners co-created actions together with the SLG members and specified the main design of the action as well as barriers and drivers and foreseen budget. These were then incorporated into the roadmaps under several policy sectors. In the following, the main actions will be shortly cross-referenced in order to identify commonalities and differences between the actions developed in the different national contexts. This section is divided into three main policy sectors. The energy, buildings, and social sector. This was done for simplicity's sake since the co-created actions take place in many different sub-sectors which would make the overall analysis and presentation too complex. For a very detailed reference and overview of the actions, however, (as well as their timing, indicators, and estimated budget requirements), please consult the individual roadmaps.

Energy Sector

Several roadmaps point to a need for action in order to **educate citizens** on the potential offered by the uptake and installation of RES technology. The Latvian roadmap e.g., points to the development of a state-run campaign to clear the myths about RES technologies, especially regarding solar systems. This campaign would also include educational courses for citizens. It comes as no surprise then that all national roadmaps point to a swift transposition of the European legislation for **energy communities to be instrumental for mitigation of energy poverty**. This is because energy communities and (collective) self-consumption models can employ business models which can hedge (vulnerable) citizens against the volality of the energy/electricity markets by offering more reliable and cheaper energy prices. Several countries already have a few energy communities in place. In those cases, a continuation of their development is foreseen. Limited (personal and economic) resources, the high workload as well as the reliance on volunteers are mentioned as barriers in this regard. In most countries, the national government is heavily lagging with the promotion of an effective legal framework as well as the provision of financial support for the creation of energy communities. This also includes the installation of digital technologies such as smart meters which, generally, can help households to optimise their energy needs. It has also been suggested to enable energy communities, so it becomes more attractive for them to act as **Energy Service Companies** (ESCOs) and to apply such activities into their business model. **Energy communities could offer renovation services** to either their members or the community in general, prioritising energy poor households. **Municipalities are seen as instrumental in setting up energy communities** and to facilitate citizens participation in such communities. In Spain, an action mentions the **inclusion of energy poverty in the legal definition of energy communities** and several roadmaps encourage energy communities to make mitigating energy poverty a key priority. However, it is clear that a reliance on volunteer-work, especially regarding the participation of energy-poor households, is a major barrier. It also needs to be acknowledged that establishing

energy communities in the most deprived locations could be difficult and not sustainable. The regions, burdened with deep poverty, lack of education and capital require more comprehensive support mechanisms to tackle energy poverty. Several roadmaps therefore contain actions which suggest subsidising rooftop PV installations as well as subsidising energy-poor household`s membership in energy communities. Mainly households living in condominium apartments could benefit from establishing an energy community, although they are facing several obstacles. Experience shows difficulty in reaching a common understanding even among socially better situated households. Several roadmaps have come up with actions which entail the development of business schemes which **allow low-income citizens to benefit from energy communities**. In several of the analyzed Member States there is a real issue due to many apartment owners either having a low-income or people not being the owner of their apartment. Both cases make it difficult to invest into an energy community. **National schemes on energy communities should therefore have a focus on including vulnerable consumers primarily**.

It is also foreseen, in several cases, to introduce **more progressive energy tariffs** which orient themselves based on the different income levels as well as to a household's energy consumption. It could be considered to introduce such tariffs via legislation and to allow energy communities to offer "**social tariffs**" without the need for energy communities having to register as a fully-fledged retail-supplier.

Several countries have included dedicated actions on promoting the **inclusion of energy poverty in municipalities Sustainable Energy & Climate Action Plans (SECAPs**). In cases where this integration has already taken place (e.g., in Latvia and Croatia), it is planned to replicate this into the SECAPs of other (if not all) of the municipalities within a country. Some of the concrete actions to be included in SECAPs are **co-financing of energy renovation of family houses** and persons at risk of energy poverty as well as the **establishment of municipal one-stop-shops and energy communities**.

Actions have also been designed to focus on a **better integration between actors engaged with energy poverty**. This should lead to greater transfer of knowledge. Within municipalities, the involvement of different parishes and entities which have a close connection to energy-poor household is foreseen. This would go hand-in hand with measures to **improve data collection at different scale of governance**.

Buildings Sector

While most countries have introduced some type of cost reduction and price caps to counter rising energy prices, a significant number of roadmaps point to a **need for action on the renovation front**. However, actions are often held back by a lack of funding and available professionals. In Hungary the establishment of a **building renovation committee** in every municipality is suggested in order to map out the least energy efficient buildings in the municipality. **One-stop-shop** (OSS) systems should be set-up that would be responsible for coordinating renovations end-to-end. It is important that such offers are situated locally in as many municipalities as possible in order to facilitate access for residents. Locally situated OSS would also be more closely involved with the local community and should be open on Saturdays to reach more people. The success of OSS (and other kind of personal support services) relies on households actually being willing to admit their situation and such systems might also be open to abuse, although professionally trained (municipal) staff and regulations can counter this. The development of an OSS would therefore have to go hand-in-hand with a general redefinition of requirements, which govern eligibility for housing renovations in order to reduce red tape. While grants to renovate the building stock typically only cover parts of the costs, several roadmaps have suggested the **introduction of grants** which cover 100% of these costs. At the same time, such **grant schemes should be more inclusive**, meaning they should not only be targeted at those suffering from general poverty, but also be inclusive of those suffering from energy poverty. It is no secret that, generally, it is more difficult to engage the private sector in renovation efforts since often private landlords do not see the benefit of additional investments in energy efficiency renovations since they are not sacrificing their quality of life, neither are they the ones paying high energy costs. In several countries, there is the additional challenge that renovation or RES actions require the agreement of more than 51% of co-owners in multi-apartment buildings. Actions are therefore planned to educate and spread awareness to **overcome split incentives**.

Social Sector

There appears to be a strong interest in the respective countries to implement more long-term support to energy poor households in the form of **social bonuses**. In some cases, a legally binding **ban on disconnections** for energy-poor households and vulnerable consumers was being discussed. For example, in Croatia a ban on disconnections was already proscribed in law, but not always is this properly followed and monitored. It is therefore important to have very clear criteria on who can be considered as an energy-poor household and who can be disconnected from the network and who cannot. This is closely connected to an action proposed in Portugal which is to **rethink the energy poverty term** in general. The term, as it is currently used, may be a cause of exclusion and may even result in a reduced participation in

mitigation campaigns as people think that the concept does not apply to them, or they might simply reject the idea of them being considered as poor. **A new set of indicators** will need to be introduced which are more inclusive of people's living realities and therefore measure more social factors to determine the state of energy poverty. They should also be inclusive, considering different energy poverty expressions (e.g., too much vs. too little energy consumption), as well as consider objective (energy consumption, income, or temperature values) and subjective (sense of comfort and/or ability to ensure energy levels) perspectives. Indicators should also consider and represent the vulnerability situation of different groups considered as more vulnerable, such as elderly people, single parents, people with disabilities or chronic diseases and ethnic minorities. This should come with clear guidelines and more efforts on how data on energy poverty is being gathered. The Portuguese roadmap has made increasing the frequency of data-gathering activities a core action. Notably, in Greece the roadmap foresees an integration of the energy poverty concept into already scheduled pilots for the creation of a Universal Basic Income (UBI) to take a leading role in. There is also a need to build more skills among social workers and other stakeholders who are involved in working with vulnerable groups of citizens. A lack of persons to be trained was identified as a barrier in this regard. Finding and working with **social media influencers** was mentioned as a promising action to potentially mitigate this. There is also a need to **identify professionals who can play an intermediary role** with energy-poor households. These professionals should be trusted by society (e.g., police officials who, in some cases, already regularly visit isolated elderly people as part of their patrols). More dedicated social actions include awareness raising campaigns targeting vulnerable households. This could be done e.g., through the **distribution of flyers with energy efficiency advice, workshops, and quizzes in school and for elderly groups, video advertisement in TV channels, also involving celebrities**. Several actions in the national roadmaps referred to further **promoting crowdfunding** solutions as a social means to gather finances for the provision of energy poverty mitigation measures.

5. EU Recommendations

As alluded to in the introduction and cross-referencing section, actions contained in the national roadmaps have certain policy implications for actions at EU level. Having made the mitigation of energy poverty a key priority of its policy design, the EU already provides a range of support actions to Member States, but also to sub-national authorities directly. The latter happens e.g., within the framework of the EU Energy Poverty Advisory Hub (EPAH) and the new energy poverty pillar of the EU Covenant of Mayors (EU CoM). Both initiatives are good examples of how multi-level governance and policy can promote more effective energy poverty action and signatory authorities of the CoM are encouraged to make energy poverty a priority within their SECAPs.

Nevertheless, on the background of most recent geo-political developments and high energy prices, there is renewed necessity for the EU to step up its focus on energy poverty in addition to the already mentioned new initiatives incl. e.g., the Social Climate Fund. Discussions leading up to the national roadmaps have once again shown that mitigating energy poverty is not only an energy issue, but rather a systems issue. It requires action on multiple levels and across different sectors. This is why the current trilogue on the Fit for 55 Package, the Social Climate Fund, as well as the discussions around the revision of the energy market design are opportune moments to issue the following recommendations.

1. The national roadmaps have made it clear that action to mitigate energy poverty goes hand-in-hand with action to drive the uptake of renewable energy in general. It is understood that long-term, a higher penetration of renewables on the grid will ultimately drive down the price of energy for end-consumers. We, therefore, urge the EU to increase of ambition for the EU's 2030 renewable energy targets to at least 50%, supported by a long-term 100% renewables target and nationally binding targets. The current national indicators developed by EPAH can inform the modeling and definition of the new targets that can also be translated to local level.

2. It is imperative that Member States foster the proper use of the funds available under e.g., the Recovery and Resilience Fund as well as the upcoming Social Climate Fund to enable the roll-out of such social energy tariffs and to support the swift uptake of renovation efforts as well the creation of municipal OSS. At the same time, the Commission is urged to reconsider the inclusion of fossil fuel-fired heating and transport in its proposal for the Social Climate Fund.

3. All roadmaps have recognized the benefit of local ownership of energy and

energy communities in order to hedge vulnerable consumers against high prices. We therefore strongly recommend that the Commission recognizes local ownership of renewable energy production as an urgent matter of securing energy supply.

4. Several Member States are still lacking concrete policies to promote vulnerable households and energy poor citizens to participate in Renewable Energy Communities (RECs) and this is always listed, in the roadmaps, as being a significant barrier. The Commission should work together with Member States to promote such measures and incentivise RECs to alleviate energy poverty at the local and regional level.

5. Therefore, in order to support the role of citizen and community energy during the ongoing energy crisis, the Commission should reflect the following elements in its Electricity Market Design legislative proposal (these points are also reflective of the European Community Power Coalition's point of view, ICLEI Europe is a member).

    a. Democratic local ownership of renewable energy production and supply should be enshrined as an operative principle of the electricity market. The Internal Energy Market should be oriented towards an objective to promote local production of renewable energy that can be matched as much as possible to local consumption, as well as to facilitate access to vulnerable citizens facing energy poverty episodes

    b. Local communities, including citizens, public authorities and SMEs, should be supported to invest and take ownership in such resources. This will help shield households from volatile and unreasonably high wholesale market prices and could be used as a way to decarbonize the fight against energy poverty, while also promoting investment and public acceptance in further renewable energy development.

    c. Recognition of a right for energy communities and local authorities to engage in local renewable electricity supply without becoming a fully-regulated retail supplier. Energy communities should be entitled to supply their members, in particular households, with their own local renewable energy without having to take up the responsibility of becoming a retail

supplier that operates across national markets. It should be possible for energy communities to enter into power purchase agreements (i.e., long-term contracts) to supply members with 'at cost' renewable electricity. Mechanisms should allow easier access to energy communities for citizens facing energy poverty challenges,

6. Nearly all national roadmaps pointed to the need for social energy tariffs as well as grant schemes to support citizens experiencing periods of energy poverty. The Commission should issue guidance and bring forward best practices to Member States on how such tariffs could be introduced while also considering changes to network tariffs and capacity costs in favour of protecting vulnerable households. The understanding of the needs and challenges of vulnerable households should also be explored further with more work in the field, as done by the POWERPOOR energy supporters and mentors network. This experience and real-life insights will make it possible to design relevant and needs-based social tariffs for citizens facing energy poverty.

7. The roadmaps have shown that engagement of the private sector in building renovation efforts is a key bottleneck for a swift uptake of renovation efforts and, consequently, the mitigation of energy poverty due to an increase in building energy performance. While the roadmaps contain actions planned on a national level to engage the private sector, EU legislation, or at least a clear communication could be introduced to make it compulsory for/urge all building owners / landlords to ensure good quality of housing for their tenants. It needs to become impossible for landlords (or large international real estate companies) to be able to make a profit without having to guarantee a good energy rating of the real estate which is being rented out. Special considerations should be taken to make building renovation more inclusive also for energy poor households. Efforts of some energy communities e.g., could be considered as good practice when it comes to promoting citizen-led renovation efforts.

8. It is recommended to consider, on a European level, the introduction of a more inclusive energy poverty definition and to introduce an indicator set, possibly complementing indicator sets currently used by the European Energy Poverty Advisory Hub and the EU Covenant of Mayors. This aim would be to allow for better monitoring over time of how energy poverty actions can have an impact on vulnerable consumer's quality of life as opposed to more economic and quantitative metrics.

9. The development of energy poverty action projects and initiatives require new and targeted sources of finance. This is the case for energy communities and especially for building renovation. Usually, this funding does not reach the most vulnerable.

10. Use of tools and technologies/data-driven approaches such as the POWERPOOR tools, should be encouraged to facilitate the identification of households facing energy poverty, but also to foster new energy poverty mitigation actions such as the ones contained in the national roadmaps.

6. National Energy Poverty Mitigation Roadmap of Bulgaria

Introduction

In the POWERPOOR project, partners are actively assessing causes of energy poverty and suggest short-term and collective energy action solutions to mitigate this problem. A highly diverse network of Energy Supporters and Mentors has been trained and is being engaged to further support energy poor households to implement solutions. The project also sets up Local Energy Poverty Mitigation Offices in engaged municipalities. POWERPOOR strives to trigger high-impact change, not only on the local and regional level, but also on the national and European level. Such a multi-level governance approach will result in long-lasting impact and coordination between local needs and national (e.g. National Energy and Climate Plans) and supra-national enabling frameworks.

The aim of the national roadmaps is then to build on current project activities and to enable the application of the POWERPOOR approach to promote integrated energy poverty mitigation policies across all regions and cities within the pilot countries. This roadmap template is a synthesis exercise based on several outputs of the Work Packages and is to be used by project partners and Energy Supporters & Mentors during the last year of the project and beyond its lifetime (also possibly to be incorporated into future Horizon projects).

Next to the project national partners, stakeholders out of the network of Energy Supporters and Mentors, especially those at the National Liaison Groups, should be invited, to take ownership of the national roadmaps and take the process forward. This work will result in lessons-learned, which, in turn, generate policy recommendations on how the national regulatory / incentive framework should be adapted to mitigate energy poverty in the first place.

The key content defined in the national roadmaps will input the POWERPOOR exploitation plan as well as the POWERPOOR EU Policy Roadmap.

In Bulgaria the POWERPOOR project started in the capital city Sofia, where in 2021 the first trainings of POWERPOOR Energy Mentors and Supporters took place and the first Energy Poverty Mitigation office was established. Since then the POWERPOOR approach has reached several municipalities in the country, and has engaged Energy Mentors and Supporters to assist energy poor households in implementing energy efficiency solutions. However, if POWERPOOR is to trigger a high-impact change nationwide, a comprehensive national exploitation plan is needed. The POWERPOOR National Roadmap of Bulgaria is developed precisely with this end in mind, to promote integrated energy poverty mitigation policies across all regions and cities within Bulgaria, building on current project activities, and extending the application of the POWERPOOR approach beyond the project's lifetime.

The First National Stakeholders Liaison Group meeting in Bulgaria took place online in 2021, when the project was presented to the potential stakeholders and they were

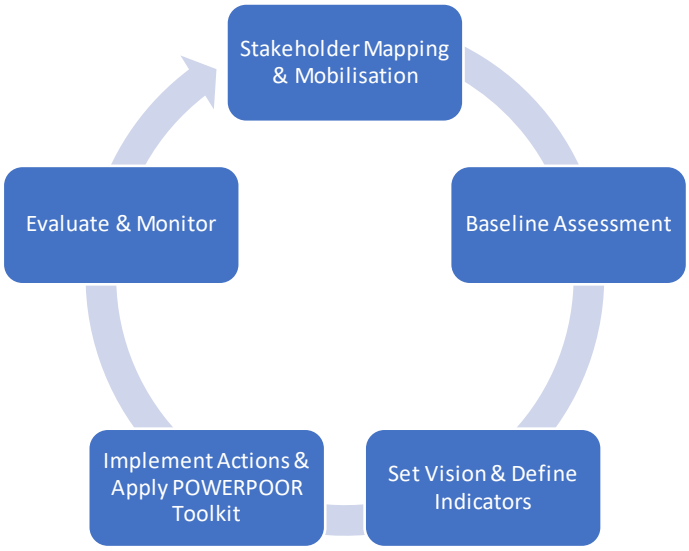
invited to take part in the project's activities. The Second National Stakeholders Liaison Group meeting in Bulgaria took place in October 2022, and was also held online. The number of participants was higher, since during the POWERPOOR trainings and the project's dissemination activities new stakeholders were identified and were invited to participate. Before the Second National Stakeholders Liaison Group meeting the idea about developing a National Roadmap was presented to the stakeholders, and an overview of the methodology for co-creating it was explained. During the meeting the road-mapping exercises were carried out and a first draft of the POWERPOOR Roadmap emerged. Subsequently, in a series of consultations with the stakeholders, a more mature version of the National POWERPOOR Roadmap was developed.

What is the methodology for the national roadmaps?

The development and adoption of the national roadmap is subdivided into two phases, which each encompasses specific steps on an integrated management cycle (adapted from ICLEI Green Climate Cities Programme). The cycle has been chosen as a basis for the roadmap since it promotes a holistic approach to policy making.

Phase 1 takes place until the end of the POWERPOOR project and includes steps which shall be carried out by partners and Energy Supporters and Mentors until then. Phase 2 takes place within one year after the project, or on any other timeline decided by the partners and stakeholders. Once the cycle has been completed a first time, the process can be repeated (and could potentially serve as a basis for future projects).

Figure 5 Roadmap Methodology



Adapted from ICLEI Green Climate Cities Handbook 2016

National Roadmap Development

Phase 1

The following three steps correspond largely to the activities carried out within the POWERPOOR project and rely strongly on the findings of Deliverable 4.2 "Baseline Assessment Report". They will form the basis for the national roadmaps and for the subsequent steps of Phase 2.

Step 1: Stakeholder Mapping, Commitment & Mobilization

As part of D4.1, project partners have carried out an initial assessment of stakeholders who are part of the National Liaison Groups, have created an overview of the expectations the different stakeholders have towards the project as well as their influence and level of expertise. As part of the road-mapping process, it becomes important to identify the relative importance of particular stakeholder groups vis-a-vis energy poverty mitigation and to identify how flexible stakeholders are to adapt their everyday (business) practices and what kind of networks exist between them. The stakeholder universe methodology, as presented in Module 4 lends itself well for this.

Below, the Bulgarian POWERPOOR stakeholders' universe is depicted. The focal point (the subject) of the system is alleviation of energy poverty, the horizontal axis (x) represents the interest of a given stakeholder in the subject, whereas the vertical axis (y) represents the adaptability of a given stakeholder towards energy poverty alleviation. Please, note: the size of the node is irrelevant.

Following the analysis of the target groups/stakeholders, the following conclusions have been made:

Ministry of Energy has a key role in alleviating energy poverty. However, their interest in the subject is not very high, and their adaptability is very low, since before implementing any significant changes, the Ministry is obliged to wait for the appropriate legislation to be adapted.

Sustainable energy development agency (SEDA) is a legal entity on state budget support and has the status of an executive agency within the Ministry of Energy. Their interest in the alleviation of energy poverty is not very high, while their adaptability is comparatively low, since they are under the control of the government.

Ministry of Regional Development and Public Works is responsible for the Programmes for energy renovation of buildings, which are directly related to the alleviation of energy poverty, thus, it has a significant interest in the subject; they also demonstrate certain degree of adaptability, since the Energy Renovation Programmes are designed based on the latest requirements for energy efficiency in buildings.

Ministry of Labour and Social Policy has significant interest in the subject, since any issue concerning poverty and social exclusion falls within their domain. However, their adaptability is very low, since before implementing any significant changes, the Ministry is obliged to wait for the appropriate legislation to be adapted.

Social services in Bulgaria are coordinated by the **Agency for Social assistance** (a legal entity with the status of an executive agency within the Ministry of Labour and Social Policy), which is considered to have high interest in the alleviation of energy poverty and to be highly adaptable.

Social care NGOs are considered to have a significant interest in the alleviation of energy poverty, as well as high adaptability to the demands of social groups in risk of poverty and exclusion.

Municipalities in Bulgaria have relatively high interest and adaptability, since energy poverty is presented in various public documents, and they have the obligation to follow the EU directives, strategies, and guidelines concerning the alleviation of energy poverty.

The **Legislation** in Bulgaria has shown so far only low interest and adaptability. However, energy poverty as a problem within the EU is presented in a number of public documents and the Bulgarian government, following the EU directives, strategies, and guidelines, has the obligation to adopt, adapt and integrate the appropriate legislation into the national framework.

Bulgarian Academy of Sciences is considered to have high interest and adaptability, since in the past few years they have proven to be a key figure in formulating the national definition of energy poverty, and have been leading the research on the legislative needs of the country regarding energy poverty alleviation.

Universities and other research institutions are considered to have high interest in the phenomenon, which they treat as a research field and as a study subject. On the other hand, they have only moderate adaptability due to the slow procedures for adapting their curricula to meet new public interests.

Banks and Financial institutions have negligible interest in the alleviation of energy poverty, but they can demonstrate high adaptability when they are motivated to develop new financial schemes to meet market demands.

Energy companies have little interest and adaptability in the alleviation of energy poverty. However, their contribution to the process can be of significant importance. Thus, through incentives and rewards they should be encouraged to play a role in the alleviation of energy poverty.

Grid companies, just as **energy companies**, have little interest and adaptability in the alleviation of energy poverty. However, their contribution to the process can be of significant importance. Thus, through incentives and rewards they should be encouraged to play a role in the alleviation of energy poverty.

RES technology companies are considered to have little interest in the alleviation of energy poverty, while their potential impact on the phenomenon can be of great value, since their technological advantages make them highly adaptable to the new social realities.

Green energy NGOs will not necessarily have any interest in the alleviation of energy poverty but their potential role in tackling energy poverty is considerable. Their agility can vary depending on their internal regulations.

In Bulgaria **energy communities** are still in their infancy. Potentially, they are related to the energy poverty phenomenon and can be instrumental in energy poverty alleviation. However, their adaptability will depend on many different factors, thus they are agile only to some extent.

Building companies have very low interest in the mitigation of energy poverty. However, potentially they can display a relatively high level of adaptability, and their policies, their decisions can have a lasting impact on energy consumption, thus they should be involved in the energy poverty alleviation activities.

Home owners (who are not energy poor themselves) are not highly interested in energy poverty alleviation but they can be very adaptable, since they can increase the energy efficiency of their buildings, thus reduce the energy expenditure.

Landlords, similar to **home owners**, are not highly interested in energy poverty alleviation but they can be very adaptable, since they can increase the energy efficiency of their buildings, thus reduce the energy expenditure.

There are many links between different stakeholders' groups representing relationships between the stakeholders in terms of flow of resources, management, consultancy, exchange of information, etc. The **Ministry of Energy** is connected to its **Agency (SEDA), municipalities, energy cooperatives**, providing them with management and consultation, the Ministry influences the national **legislation** regarding energy issues, which in turn provides the activities of the Ministry with regulatory framework. The Ministry is also connected to the **Bulgarian Academy of Sciences, the Universities**, and various **research institutions**, since information about the latest advancement in scientific research and technology is crucial for the decision-making process of the **Ministry**.

The **Ministry of Regional Development and Public Works** is responsible for the conduction of a reform for the country's development, the spatial planning of the territory, the setting up of the main networks and facilities for technical infrastructure. In terms of alleviating energy poverty, it has to work in cooperation with the building sector, with energy providers and grid companies, regulating their work and adjusting his own agenda according to their feedback. The **Ministry** also has to exchange two-ways information with the **Agency for Social Assistance**, the **Agency for Sustainable Energy Development**, since their work is related to the Ministry's key strategies.

The **Ministry of Labour and Social Policy** is regulating the social services through its Agency, and it is also related to **SEDA**, to **Social Care NGOs**, and to the municipalities, which are responsible for the implementation of the Ministry's policies. The Ministry of Labour and Social Policy influences the national **legislation** regarding social issues, which in turn provides the activities of the Ministry with regulatory framework. The Ministry is also connected to the **Bulgarian Academy of Sciences, the Universities**, and various **research institutions**, since information about the latest advancement in scientific research and technology is crucial for the decision-making process of the Ministry. During the meetings of the Commission for Energy Efficiency and Energy

Poverty a gap in the relationship between the Ministry of Energy and the Ministry of Labour and Social Policy was discovered. It became clear that for the identification of energy poor household different sources of data have to be available, thus, there is a need for something like a hybrid institution between these two Ministries.

The **Legislation** is directly related to the Ministries, but also to energy companies, grid companies, building companies and some other stakeholders, providing them with regulatory framework for their activities.

The **Bulgarian Academy of Sciences** is connected to the **Universities, and other research institutions** in a network of collaboration. Together they provide the Ministries and the legislation with consultation when shaping new policies.

The **Municipalities** are entangled in a two-way exchange with almost all of the stakeholders, receiving various resources from the government and distributing them on a local level, receiving information, legislation, and guidance from the government, and regulating accordingly on a local level. **Banks and other financial institutions** are also involved in a two-way exchange, providing financing for various projects aimed at energy poverty alleviation, and receiving incentives and guidance from the government, so to adapt adequately their financial instruments.

Energy providers, **Grid companies**, **Energy technology companies**, and **Green energy companies** are all entangled in a network of mutual dependance and collaboration, while also maintaining relationships with **Energy communities**, **Home owners associations, Landlords,** and **Building companies**.

Building companies are receiving regulatory framework, funding, and information from the government, while collaborating with Home owners associations, **Landlords**, and **Technology companies**.

The POWERPOOR stakeholder universe exercise was initially prepared by SEA SOFENA. The exercise was introduced and performed during the Second National Stakeholders Liaison Group meeting on Oct. 3, 2022 in Sofia. Subsequently, the Universe was send to the participants and they made comments, suggestions, corrections, resulting in the Universe presented below.

Figure 6 Bulgaria Stakeholder Universe

National Liaison Group stakeholders:

Tsvetomira Kulevska - Director at "Coordination and Management of EE and RES" DG Sustainable Energy Development Agency Bulgaria

Sustainable Energy Development Agency (SEDA) is a legal entity at state budget support with headquarters in Sofia and has the status of an executive agency within the Ministry of Energy.

Chief Assist. Prof. Theodora Peneva, Economic Research Institute, Bulgarian Academy of Sciences

Chief Assist. Prof. Theodora Peneva is the leading scholar working on the definition of Energy poverty in Bulgaria.

Eleonora Gaydarova - Chairperson, CAC Centre for Sustainable Housing

Experienced housing and sustainability consultant with a broad skill set across consultancy and research in the housing sector, covering environmental, social and legal aspects of housing, housing affordability and energy efficiency. Specialization in the renovation of condominium housing and management of energy poverty as a result of the lack of access to affordable energy and poor overall quality of homes.

Genady Kondarev - Senior Associate For Central And Eastern Europe at E3G

E3G is an independent climate change think tank with a global outlook. We work on the frontier of the climate landscape tackling the barriers and advancing the solutions to a safe climate.

Energy Agency Plovdiv (www.eap-save.eu)

The agency is promoting efficient and sustainable use of energy and renewable energy. Its services are utilized by the public administration, businesses communities, and consumers. It carries out feasibility studies, energy and environmental analyses and modelling, energy and air quality projects identification, development and management. More than 50 EU projects were successfully completed.

Maria Manolova- Project Manager at EnEffect Center for Energy Efficiency www.eneffect.bg

EnEffect's principal objectives are: to contribute to the development of energy efficiency policy at all management levels in Bulgaria to achieve economic and environmental benefits for the country; to assist the process of institutional development and capacity building in Bulgaria as a prerequisite for the initiation, development and implementation of energy efficiency projects and programs.

Habitat for Humanity Bulgaria – www.hfh.bg

This is a public benefit foundation that works to improve housing conditions and eliminate housing poverty, and develops its activities in four key strategic areas – affordable housing construction, housing improvement financing, development of innovative products and market-based tools to improve the accessibility of housing improvements, participation in housing policies, strategic and programmatic documents.

Petar Kisyov - Manager Green Synergy Cluster http://greensynergycluster.eu/

Green Synergy is a cluster organisation implementing sustainable solutions in the following fields: Sustainable Energy Planning, Renewable Energy, Energy Efficiency, Renewable Energy Communities, Smart Cities and Positive Energy Districts, Biomass to energy, Bio-based industries.

Prof. Dr. Georgi Georgiev – New Bulgarian University

Prof. Dr. Georgi Georgiev has been chair of the Department of Architecture since December 2012. Besides being a university lecturer he heads the Bulgarian Housing Association – the first non-governmental association in the field of housing and

housing policies. He has specialized in: consulting on urban and housing development, expertise in housing finance, management and housing renovation, energy efficiency and accessibility of housing, property management and urban regeneration. He is vice-chair of the working group in the thematic field: 3. Architecture and Quality of Life – Housing Policy of the Architects' Council of Europe.

Step 2: Baseline Assessment

The state of play / baseline for what concerns energy poverty in the overall country has already been analysed at the beginning of the project and captured in D4.2. As part of the roadmap process, it is recommended to revaluate the baseline parameters (subject to available capacities of course) to see if any changes have occurred since the last baseline assessment. The baseline assessment should then be presented during the meeting with the stakeholders of the National Liaison Group. Key policy areas to be, at least, presented as part of the baseline assessment are the following. Consider how energy poverty mitigation is addressed in the following areas and fill out the table below.

Updated Baseline Assessment

Updated according to the data available for 2020-2021:

- Arrears on utility bills 19.2%
- Inability to keep home warm 23.7%
- Household electricity prices 0.106
- Household natural gas prices 0.054
- Population living in dwellings with leak, damp, rot 11%
- Population at poverty risk 32.1%

(Source: EPAH)

Table 6 Bulgaria Updated Baseline Assessment

National Energy and Climate Plan (NECP)	The goal of reducing the level of energy poverty in Bulgaria is addressed in the Bulgarian NECP within the Internal Energy Market dimension, as part of the National objectives and targets. More specifically, Bulgaria will aim to achieve adequate protection of people at risk of energy poverty by providing target heating allowances via: A mechanism for the protection of vulnerable consumers following full liberalisation of electricity prices for final consumers, including households; Building stock renovation - The renovation of multi-family

	residential buildings with a view to upgrading them to energy class C will lower the average monthly cost of heating homes and may result in low-income households being able to improve their living conditions sufficiently to be dropped from the category of households at risk of energy poverty; Improving energy efficiency by complementing the national target under Article 7 of Directive 2012/27/EU through a requirement for the implementation of measures, as a matter of priority, to improve energy efficiency for the benefit of vulnerable clients, including households affected by energy poverty and, when appropriate, in buildings used for social housing. The Bulgarian NECP was published in December 2019
The building sector - renovation efforts	Substantial efforts and financial aid has been given for increasing energy efficiency and the transition to RES. In the NECP is planned improving energy efficiency by complementing the national target under Article 7 of Directive 2012/27/EU through a requirement for the implementation of measures, as a matter of priority, to improve energy efficiency for the benefit of vulnerable clients, including households affected by energy poverty and, when appropriate, in buildings used for social housing. In 2015 the National Programme for Energy Efficiency of Multi-family Residential Buildings was voted. It provided up to 100% financing of projects for energy efficiency of multi-family residential buildings including renovation and restauration of buildings, implementation of energy efficiency measures that are prescribed as mandatory for the building in the energy efficiency survey, such as replacement of joinery (windows, doors, showcases, etc.); thermal insulation of the external envelope elements (external walls, roofs, floors, etc.); modernization or replacement of local systems for

	heating and/or cooling, etc. The aim of the Programme was to upgrade the energy efficiency of the buildings to class C.
Social care	In the NECP, in addition to the measures designed to encourage the active participation of consumers in the electricity supply market, measures designed to protect consumers are also applied. The policy for full electricity market liberalisation includes measures guaranteeing a smooth and gradual transition for households (in accordance with Article 15(8) of Directive 2012/27/EU). At present, the electricity market in Bulgaria is partly liberalised, with a regulated share of 40 %. In line with Third Liberalisation Package of the EU, Bulgaria took steps toward full liberalisation of its electricity market. The phasing out of regulated prices for all final consumers will boost competition among electricity suppliers but it will also expose consumers to greater price volatility. During this gradual transition the retail prices of electricity is to be deregulated in several stages until fully liberalised. Full electricity price liberalisation in the household sector will be given the green light only after a mechanism for the protection of vulnerable consumers of electricity has been put in place. These are the household consumers in a state of energy poverty due to a combination of low income, high energy costs and low energy efficiency of the homes they live in. The mechanism for protection of vulnerable consumers will include criteria for their identification, and financial and non-financial measures for their protection. It aims to ensure that the minimum quantity of electricity, other than the quantity of energy for heating for which consumers in this group are entitled to receive a separate allowance, are covered throughout the year. At present assistance is provided to vulnerable consumers on a means tested basis. Pursuant to the Social Assistance Act and Regulation No RD-07-5 of

	16 May 2008 on the terms and procedure for allocation of targeted heating assistance, targeted heating assistance is provided to some socially vulnerable groups during the heating season. At present, about 250 000 individuals and families are recipients of such assistance, that means heating allowances are provided for the respective heating season (1 November—31 March), i.e. for 5 months, in an amount determined by an order of the Minister for Labour and Social Policy adopted before the beginning of the season, taking into account the electricity price for household customers determined by the KEVR on the basis of a projected consumption of 385 kWh electricity, including 280 kWh at the daytime rate and 105 kWh at the night-time rate (the quantity of energy required for heating one room). There is an option to select the type of fuel: solid fuel, electricity, gas or heat. This type of assistance will continue to be applied as a measure to support energy poor people and to protect vulnerable consumers of electricity, ensuring all-year cover of minimum electricity needs other than heating needs.
Policy to promote community-ownership of energy	Practically non-existing in Bulgaria. The Renewable Energy Directive Recast (RED II) has not been transposed to the national law so far.
Policy to promote (collective) finance / crowdfunding	Practically non-existing in Bulgaria.
The energy market (e.g. social tariffs / tax incentives)	**Regulated energy market** - The highly regulated Bulgarian electricity market is dominated by a few major players that have built a supply monopoly in the country. Despite the legal unbundling of the three distribution system operators from its vertically integrated undertaking, there is no real competition in the distribution market that could enable consumers to choose their supplier as there is only one licensed supplier in each geographical region. Bulgaria's energy intensity is among the

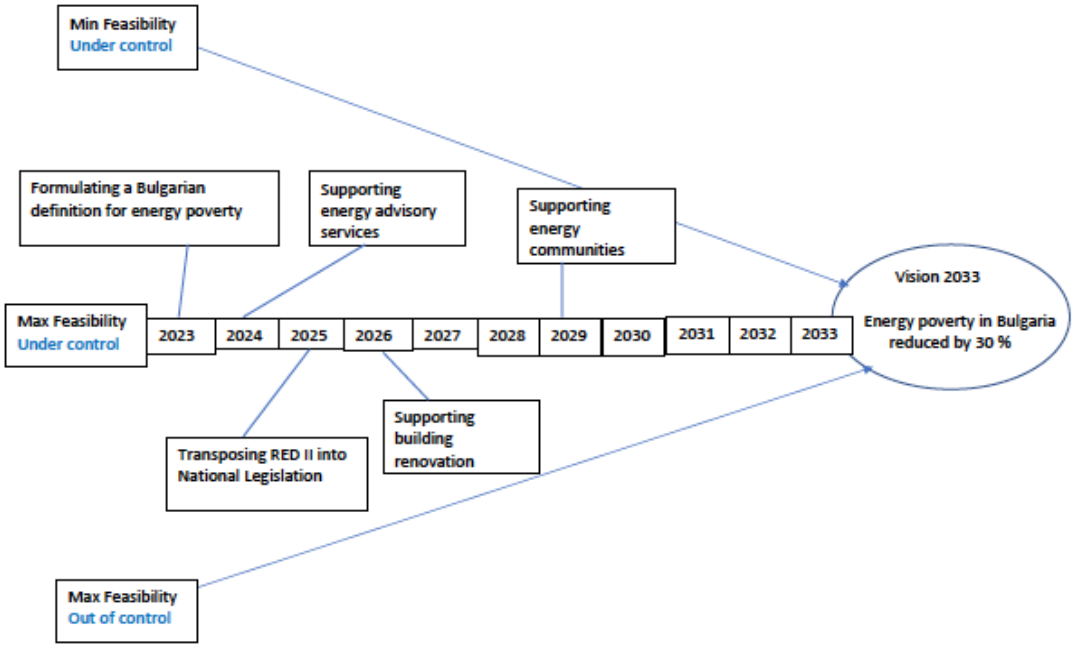
	highest in the EU. The country is dependent on imported fuels from Russia and, at the same time, the country is attempting to develop itself as an energy hub. **Social tariffs** - In Bulgaria at the moment there are no social tariffs for energy or other incentives for vulnerable consumers. In the beginning of the Covid-19 crises as a social protection scheme there was a temporary measure to not disconnect households from the electricity supply during the winter season but the measure only applied to the 2019/2020 season. **Replacement of appliances** - The project **Bulgarian Municipalities Working Together to Improve Air Quality** (LIFE-IP Clean Air) is an integrated project according to the REGULATION (EU) No 1293/2013 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 11 December 2013 on the establishment of a Programme for the Environment and Climate Action (LIFE) and repealing Regulation (EC) No 614/2007. The duration of the project is 6 years; from 2018 to 2024. The project budget is EUR 16.7 million, and the financial contribution of the European Commission is 60%. The main objective of the Integrated project is improvement of air quality in the municipalities of Sofia, Burgas, Ruse, Stara Zagora, Veliko Tarnovo and Montana. The core instrument to achieve the objective is design and implementation of a scheme for transition to alternative forms of the household heating in the six municipalities. The scheme envisages transition from heating with wood and coal to heating with pellets, gas or use of the central heating network.

Consumer protection	Energy prices on the regulated market are fixed, by reference, or formula- based, indicating low levels of competition in the energy sector. The country's regulatory regime is unpredictable.
SECAPs	Only 47 Bulgarian municipalities are signatories in the Covenant of mayors initiative, and very few of them have submitted a SECAP as yet. Instead, many municipalities adopt Energy efficiency programmes or RES transition programmes. POWERPOOR Bulgarian partner SEA SOFENA has been actively involved in the development of some of these Programmes (municipality of Isperich, municipality of Sitovo), and has supported these municipalities to promote energy poverty alleviation actions. The Energy Efficiency / RES transition programmes of the municipalities of Shabla, Radnevo, Valchidol, Burgass already have a chapter on alleviation of energy poverty, including a strategy and relevant actions where the POWERPOOR approach is described as an example of a good practice.

Step 3: Set Vision, envision Actions and define Indicators

During the Second national Stakeholders Liaison Group meeting, the members of the Group proposed actions for tackling energy poverty, which were evaluated and discussed. The process was based on a POWERPOOR exercise and meant drafting of two cones: The first one presented the necessary measures to alleviate energy poverty in Bulgaria, evaluated in terms of feasibility and control. The second cone presented the impact and the effort needed for the implementation of the proposed action.

Figure 7 Future Radar Bulgaria



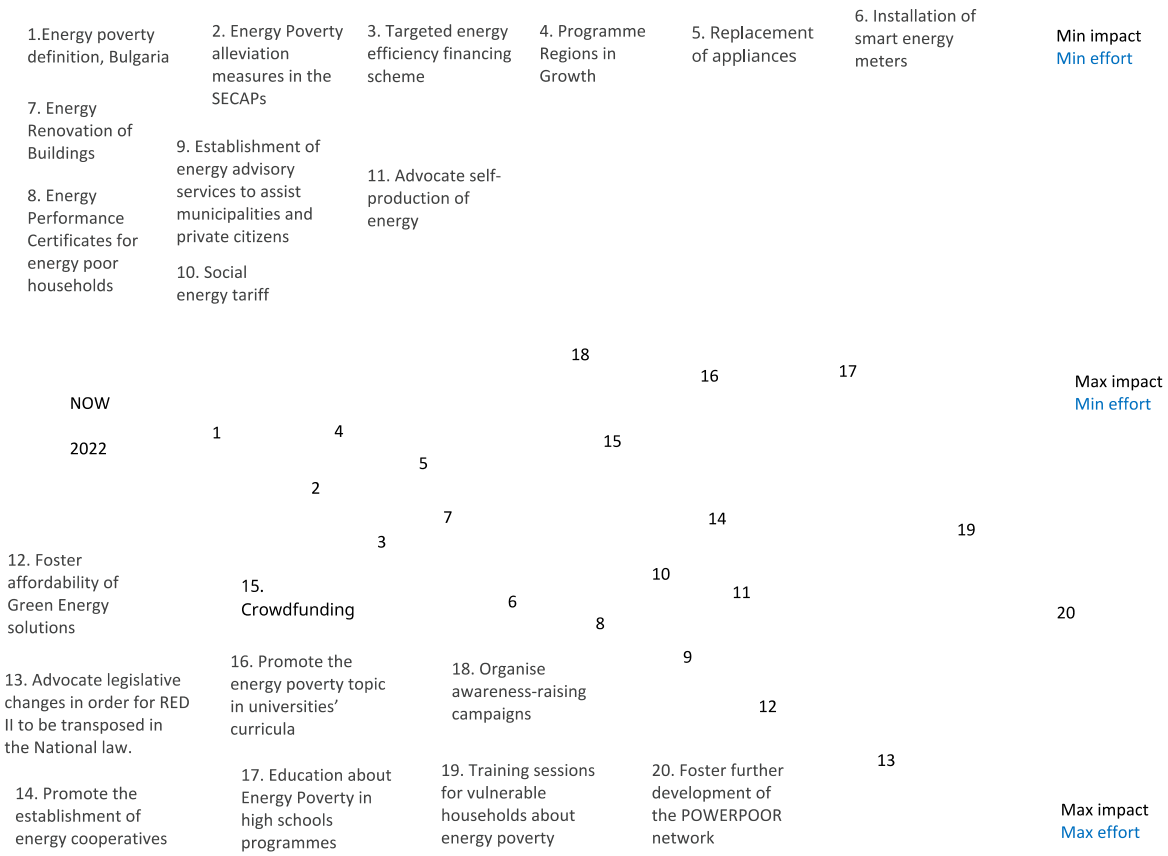


Table 7 Bulgaria Actions

Policy Sector	Actions to be implemented	By when?	By whom?
Energy poverty definition, Bulgaria	A definition of energy poverty in alignment with the EU energy strategy and with the energy poverty situation in Bulgaria to be formulated and adopted by the government.	Jan. – Feb. 2023	**The Commission for Energy Efficiency and Energy Poverty of the Council of Ministers.** Lead by the BAS, co-created by a number of stakeholders: Ministry of Energy, Ministry of Labour and Social Politics, Sustainable Energy Development Agency, SEA SOFENA, etc.
SECAPs, other Energy Efficiency, RES transition, and Climate related municipal programmes	Include Energy Poverty alleviation measures in the SECAPs and other Energy Efficiency, RES transition, and Climate related municipal programmes.	2025	**Municipalities, SEA SOFENA**, other organisations/ consultants involved in the drafting of the SECAPs, and other Energy Efficiency, RES transition, and Climate related municipal programmes.
Building sector – energy efficiency, renovation	**Targeted energy efficiency financing schemes** to support the cost for improvements of households affected by energy poverty and, when appropriate, in buildings used for social housing. For example, through the **Programme for energy efficiency in buildings,** which is still under development and it is funded by the National Resilience and Recovery Plan. Substantial	2023 – 2027	**Ministry of Regional Development and Public Works**, Ministry of Energy; Ministry of Labour and Social policy; local authorities in consultation and collaboration with SEA SOFENA and the EPAOs; Building companies.

	efforts and financial aid planned for increasing energy efficiency and the transition to RES by complementing the national target under Article 7 of Directive 2012/27/EU through a requirement for the implementation of measures, as a matter of priority, to improve energy efficiency for the benefit of vulnerable citizens.		
	Organizing media campaigns and through the EPAOs **promote to vulnerable citizens the *Programme Regions in Growth***, funded by the Just Transition Fund. It is focused on the transition to RES, upgrading to a higher energy class, usage of green technologies. Collaborate with local administration to prioritize energy poor households and vulnerable consumers.	2023 – 2027	**Ministry of Regional Development and Public Works;** Ministry of Energy; Energy companies; other organisations working in the energy efficiency field.
	Organizing media campaigns and through the EPAOs **promote to vulnerable citizens the next stage of the project *Replacement of appliances - Bulgarian Municipalities Working Together to Improve Air Quality*** (LIFE-IP Clean Air). This is an integrated project according to the REGULATION (EU) No 1293/2013 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 11 December 2013 on the	2023 -2026	**Municipalities,** Producers of electric appliances for heating, SEA SOFENA, Energy Agency Plovdiv

	establishment of a Programme for the Environment and Climate Action (LIFE) and repealing Regulation (EC) No 614/2007. The duration of the project is 6 years; from 2018 to 2024. The project budget is EUR 16.7 million, and the financial contribution of the European Commission is 60%. The main objective of the Integrated project is improvement of air quality by reducing the emissions of small particulate matter (PM10) from domestic heating in the municipalities of Sofia, Burgas, Ruse, Stara Zagora, Veliko Tarnovo and Montana. The core instrument to achieve the objective is design and implementation of a scheme for transition to alternative forms of the household heating in the six municipalities. The scheme envisages transition from heating with wood and coal to heating with pellets, gas or use of the central heating network. The order is for delivery, installation and warranty service of electric heating devices, natural gas, heating, pellets and radiators. **Collaborate** with local administration to prioritize energy poor households and vulnerable consumers.		
	Promote the installation of smart energy meters, giving	2023 - 2033	**Ministry of Regional Development and**

	priority to energy poor households and vulnerable consumers.		**Public Works,** Ministry of Energy,; Energy companies; Building companies, others
	Support and consult energy poor household and vulnerable consumers to apply for the new stage of the **Energy Renovation of Buildings Program for multi-family residential buildings**. It is financed with nearly 1.4 billion euros from the National Recovery and Resilience Plan.	2023 – 2024	**Ministry of Regional Development and Public Works**; Municipalities; local administration; building companies.
	Assist and consult energy poor household and vulnerable consumers to obtain **Energy Performance Certificates** for new and existing buildings. Advocate the development of financial schemes to support energy poor household and vulnerable consumers with the upfront cost of the technical evaluation of their buildings.	2023 - 2027	**Ministry of Energy**, Building companies; energy companies; certified evaluating agents.
Social care	Support the establishment of **energy advisory services to assist municipalities and the private citizens**, such as energy poverty alleviation offices (EPAOs).	2023 – 2026	**Municipalities;** local administration; electricity providers, NGOs.
	Advocate for the establishment of a **social energy** tariff and other measures for protection against disconnection from the grid for energy poor household and vulnerable consumers.	2023-2024	**Ministry of Labour and Social policy**; Ministry of Energy; other stakeholders.

	Advocate **self-production of energy** for everyone, for individuals, households, or energy communities.	2026	**Ministry of Labour and Social policy; Ministry of Energy; Municipalities;** electricity providers; NGOs.
Green Energy	**Foster affordability** of Green Energy solutions, for example within the **Programme *Regions in Growth,*** funded by the Just Transition Fund and focused on the transition to RES, upgrading to a higher energy class, usage of green technologies. Assist energy poor household and vulnerable consumers in obtaining financial aid for the installation of RES, using the **National Recovery and Resilience Plan**, or other programmes.	2025 and later on	**All stakeholders:** NGOs, local municipalities.
Energy communities/ cooperatives	**Advocate legislative changes in order for RED II** to be transposed in the National law. In the Law should be included incentives for the energy communities' development based on their potential for greater social impact.	2023 – 2026	**Bulgarian Academy of Sciences**, Council of Ministers, all stakeholders.
	Promote the establishment of **energy cooperatives,** at least one for every one of the larger municipalities. The action should also foresee energy poverty mitigation on local level.	2023 - 2033	**Municipalities**; Ministry of Energy; Ministry of Labour and Social Policy; NGOs; energy providers.

Crowdfunding	Advocate, facilitate, and network to support energy communities to secure funding for their projects using crowdfunding.	2023 - 2026	**SEA SOFENA and Energy Agency Plovdiv**; other NGOs; local municipalities.
Education about Energy Poverty	Promote the **energy poverty** topic as a research field and a study subject in **universities' curricula.** Encourage education about **Energy Poverty in high schools** programmes, especially vocational high schools.	2030 2030	Ministry of Education, Bulgarian Academy of Sciences Ministry of Education, SEA SOFENA, other NGOs.
Awareness-raising campaigns	**Organise awareness-raising campaigns** to increase public awareness regarding energy poverty; involve local energy poverty alleviation offices in local campaigns; promote existing online tools that would help citizens and interested parties to access information about energy efficiency and energy poverty. **Organise training sessions** for vulnerable households about energy poverty and possibilities for energy efficiency optimisation. **Promote** the POWERPOOR EPAOs.	2023 - 2033 2023 - 2033	**SEA SOFENA;** local administrations; EPAOs; other stakeholders. **SEA SOFENA;** local administrations; EPAOs; other stakeholders
POWERPOOR network	**Foster further development** of the POWERPOOR network of Energy Mentors and Supporters.	2023 - 2030	**SEA SOFENA; POWERPOOR Energy Supporters and Mentors network**

Table 8 Bulgaria Action-Specific Indicators

Indicator	**Baseline (2022)**	**Target (date dependent on the action)**
Definition of Energy Poverty	Under development	Jan. – Feb. 2023
Energy Poverty alleviation measures in the SECAPs and other Energy Efficiency, RES transition, and Climate related municipal programmes.	Insignificant	2024 30% of existing and newly defines Plans have a dedicated chapter
Replacement of old wood and coal heating devices with new ecological options in energy poor households and vulnerable consumers.	n/a	2024 No less than 6 000 households have their appliances replaced
Energy efficiency renovation of multi-family buildings.	7% of the living space in Bulgaria is class A or B.	2024 No less than 1200 buildings have increased their energy efficiency to class B.
Operation of energy advisory services (POWERPOOR Energy Poverty Alleviation Offices)	2	2023 increased number of Energy Poverty Alleviation Offices by 50%
Transpose RED II into National Law	n/a	2023
Capacity building and networking support programmes to energy communities	5	2024 Increased by 100%

Phase 2

The previous first three steps of the management cycle laid out the basis for the national roadmaps. The content of those steps will have been discussed during various stakeholder consultations. The results will inform the next two steps which take place within one year following the closure of POWERPOOR (or any other timeline decided upon during stakeholder consultations).

Step 4: Implement Actions and apply POWERPOOR Toolkit

This is where the concrete actions, defined previously, are implemented according to the established timeline. For each action, a plan has been created and highlight, at least, the following elements.

Table 9 Bulgaria Action Elements

Action under the policy sector: Energy poverty definition, Bulgaria **A definition of energy poverty in alignment with the EU energy strategy and with the energy poverty situation in Bulgaria to be formulated and adopted by the government.**	
The responsible entity and leading person	**The Commission for Energy Efficiency and Energy Poverty of the Council of Ministers.** Lead by the BAS, co-created by a number of stakeholders: Ministry of Energy, Ministry of Labour and Social Politics, Sustainable Energy Development Agency, SEA SOFENA, etc.
The target group for the action	All citizens of Bulgaria, and especially the energy poor households and vulnerable citizens.
Project design and documentation	**The Commission for Energy Efficiency and Energy Poverty of the Council of Ministers,** consisting of about 30 members (ministries, organisations and individuals) who are collaborating in order to finalise a national definition, since June 2022 is meeting regularly to work on the definition.

Scheduling	Jan. – March 2023
Budget	Not applicable
Drivers	The government's obligation to protect the citizens from poverty and social exclusion, and to guarantee a just transition to RES for all.
Barriers	There is no government to vote the new definition yet.

Action under the policy sector: SECAPs, other Energy Efficiency, RES transition, and Climate related municipal programmes **Include Energy Poverty alleviation measures in the SECAPs and other Energy Efficiency, RES transition, and Climate related municipal programmes.**	
The responsible entity and leading person	**Municipalities, SEA SOFENA**, other organisations/ consultants involved in the drafting of the SECAPs, and other Energy Efficiency, RES transition, and Climate related municipal programmes.
The target group for the action	All citizens of Bulgaria, and especially the energy poor households and vulnerable citizens.
Project design and documentation	In 2022 very few municipalities in Bulgaria have approved a SECAP or any other Energy Efficiency, RES transition, and Climate related Plan or programme. Currently, these plans are being actively drafted. Thus, the consultants, responsible for the contents of the Plans/ Programmes should include a chapter on Energy Poverty alleviation measures.
Scheduling	2023 – 2026
Budget	Not applicable
Drivers	The government's obligation, in alignment with EU energy poverty

	mitigation strategy, to take active measures to alleviate energy poverty in the country.
Barriers	Lack of public awareness about the extent of energy poverty in the country, and lack of understanding of the serious consequences energy poverty can have on people's health and social inclusion.

Action under the policy sector: Building sector – energy efficiency, renovation **Targeted energy efficiency financing schemes to support the cost for improvements of households affected by energy poverty**	
The responsible entity and leading person	**Ministry of Regional Development and Public Works**, Ministry of Energy; Ministry of Labour and Social policy; local authorities in consultation and collaboration with SEA SOFENA and the EPAOs; Building companies.
The target group for the action	Energy poor households and vulnerable consumers.
Project design and documentation	**Targeted energy efficiency financing schemes** can be funded, for example, through the **Programme for energy efficiency in buildings,** which is still under development and it is funded by the **National Resilience and Recovery Plan**. Substantial efforts and financial aid planned for increasing energy efficiency and the transition to RES by complementing the national target under Article 7 of Directive 2012/27/EU through a requirement for the implementation of measures, as a matter of priority, to improve energy efficiency for the benefit of vulnerable citizens.

Scheduling	2023 - 2027
Budget	Not applicable
Drivers	Bulgaria is one of the countries with the highest use of energy in households and needs to reduce its consumption. In order to reach its energy saving targets, the government has to assist energy poor households in covering the upfront cost for energy efficiency measures.
Barriers	The absence of a definition for energy poverty, which prevents the identification of energy poor households and providing them with financial aid.

Action under the policy sector: Building sector – energy efficiency, renovation **Organizing media campaigns and through the EPAOs promote to vulnerable citizens the Programme Regions in Growth, funded by the Just Transition Fund. It is focused on the transition to RES, upgrading to a higher energy class, usage of green technologies. Collaborate with local administration to prioritize energy poor households and vulnerable consumers.**	
The responsible entity and leading person	**Ministry of Regional Development and Public Works;** Ministry of Energy; Energy companies; other organisations working in the energy efficiency field.
The target group for the action	Energy poor households and vulnerable consumers.
Project design and documentation	Engaging Energy poor households and vulnerable consumers in the development of RES can be done with information campaigns targeting especially energy poor citizens and vulnerable consumers. These campaigns should be done in collaboration with the EPAOs to ensure an extended coverage of the vulnerable citizens.

Scheduling	2023 - 2033
Budget	Not applicable
Drivers	The government's obligation to guarantee a just transition to RES to all people; the ambition to reduce carbon footprint.
Barriers	Lack of understanding of power poverty, and of the great opportunities provided by transitioning to RES;

Action under the policy sector: Building sector – energy efficiency, renovation **Promote to vulnerable citizens the next stage of the project Replacement of appliances - Bulgarian Municipalities Working Together to Improve Air Quality**	
The responsible entity and leading person	**Municipalities,** Producers of electric appliances for heating, SEA SOFENA, Energy Agency Plovdiv
The target group for the action	All citizens who use wood and coal heating devices.
Project design and documentation	Organizing media campaigns and through the EPAOs **promote to vulnerable citizens the next stage of the project Replacement of appliances - Bulgarian Municipalities Working Together to Improve Air Quality.** This is an integrated project according to the REGULATION (EU) No 1293/2013 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 11 December 2013 on the establishment of a Programme for the Environment and Climate Action (LIFE) and repealing Regulation (EC) No 614/2007. The duration of the project is 6 years; from 2018 to 2024. The project budget is EUR 16.7 million, and the financial contribution of the European Commission is 60%.

	The main objective of the Integrated project is improvement of air quality by reducing the emissions of small particular matter (PM10) from domestic heating in the municipalities of Sofia, Burgas, Ruse, Stara Zagora, Veliko Tarnovo and Montana. The core instrument to achieve the objective is design and implementation of a scheme for transition to alternative forms of the household heating in the six municipalities. The scheme envisages transition from heating with wood and coal to heating with pellets, gas or use of the central heating network. The order is for delivery, installation and warranty service of electric heating devices, natural gas, heating, pellets and radiators. **Collaborate** with local administration to prioritize energy poor households and vulnerable consumers.
Scheduling	2023 - 2024
Budget	Not applicable
Drivers	The obligation to achieve a significant improvement of the air on the territory of different municipality, by reducing the emissions of small particulate matter (PM10) from domestic heating.
Barriers	So far, the project does not prioritize energy poor households and vulnerable citizens. The lack of definition makes it difficult to identify them as a target group. Using alternative forms of heating can be more expensive, thus preventing energy poor citizens to participate in the programme.

Action under the policy sector: Building sector – energy efficiency, renovation **Installation of smart energy meters, giving priority to energy poor households and vulnerable consumers.**	
The responsible entity and leading person	**Ministry of Regional Development and Public Works,** Ministry of Energy; Energy companies; Building companies, others.
The target group for the action	All energy consumers in Bulgaria.
Project design and documentation	**Promote the installation of smart energy meters,** giving priority to energy poor households and vulnerable consumers. **Collaborate** with local administration to prioritize energy poor households and vulnerable consumers.
Scheduling	2023 - 2033
Budget	It should be made available through the National Recovery and Resilience Plan.
Drivers	The obligation to optimise energy consumption in households.
Barriers	The smart meters will require training of the end-users on how to use them.

Action under the policy sector: Building sector – energy efficiency, renovation **Energy Renovation of Buildings Program for multi-family residential buildings to prioritize energy poor households and vulnerable citizens.**	
The responsible entity and leading person	**Ministry of Regional Development and Public Works**; Municipalities; local administration; building companies.
The target group for the action	Energy poor households and vulnerable citizens

Project design and documentation	Support and consult energy poor household and vulnerable consumers to apply for the new stage of the **Energy Renovation of Buildings Program for multi-family residential buildings**. It is financed with nearly 1.4 billion euros from the National Recovery and Resilience Plan.
Scheduling	2023 - 2024
Budget	The Programme has 1.2 billion budget and it offers 100% financial aid towards energy efficiency renovation.
Drivers	The obligation to increase the energy efficiency of multi-family buildings at least to class B.
Barriers	The application time is very short and there is a lot of documentation required.

Action under the policy sector: Building sector – energy efficiency, renovation **Energy Performance Certificates for energy poor households and vulnerable citizens**	
The responsible entity and leading person	**Ministry of Energy**, Building companies; energy companies; certified evaluating agents.
The target group for the action	Energy poor households and vulnerable citizens
Project design and documentation	Assist and consult energy poor household and vulnerable consumers to obtain **Energy Performance Certificates** for new and existing buildings. Advocate the development of financial schemes to support energy poor household and vulnerable consumers with the upfront cost of the technical evaluation of their buildings.
Scheduling	2023 - 2027

Budget	None available so far
Drivers	The obligation to obtain **Energy Performance Certificate** for every building. The obligation to increase the energy efficiency of multi-family buildings at least to class B.
Barriers	The Certificate requires a professional evaluation of the energy performance of the building, which can be very expensive, and there is no financial aid for covering the cost.

Action under the policy sector: Social care **Establishment of energy advisory services to assist municipalities and the private citizens**	
The responsible entity and leading person	**Municipalities;** local administration; electricity providers, NGOs.
The target group for the action	Energy poor households and vulnerable citizens
Project design and documentation	Support the establishment of **energy advisory services to assist municipalities and the private citizens**, such as energy poverty alleviation offices (EPAOs).
Scheduling	2023 - 2026
Budget	None secured as yet.
Drivers	The general public needs to have access to quality assistance in matters of energy efficiency, Energy transition, RES, etc.
Barriers	No funding is available for such an initiative as yet.

Action under the policy sector: Social care Social energy tariff	
The responsible entity and leading person	**Ministry of Labour and Social policy**; Ministry of Energy; other stakeholders.
The target group for the action	Energy poor households and vulnerable citizens
Project design and documentation	Advocate of the establishment of a **social energy tariff** and other measures for protection against disconnection from the grid for energy poor household and vulnerable consumers.
Scheduling	2023 - 2024
Budget	Not applicable
Drivers	The need to protect the high number of energy poor households and vulnerable citizens, who are at risk of illnesses and death during winter due to inability to keep their houses warm and/ or to pay a high electricity bill.
Barriers	There is need first to identify who can be considered energy poor in order to facilitate the application of the tariff.

Action under the policy sector: Social care Advocate self-production of energy	
The responsible entity and leading person	**Ministry of Labour and Social policy; Ministry of Energy; Municipalities;** electricity providers; NGOs.
The target group for the action	All energy consumers

Project design and documentation	Advocate **self-production of energy** for everyone, for individuals, households, or energy communities.
Scheduling	2023 - 2026
Budget	Not applicable
Drivers	The need to achieve greater energy security. The need to protect the high number of energy poor households and vulnerable citizens, who are at risk of illnesses and death during winter due to inability to keep their houses warm and/ or to pay a high electricity bill.
Barriers	The required legislation is still not in place.

Action under the policy sector: Green energy **Foster affordability of Green Energy solutions**	
The responsible entity and leading person	**All stakeholders:** NGOs, local municipalities.
The target group for the action	**Energy poor households and vulnerable citizens**
Project design and documentation	**Foster affordability of Green Energy solutions,** for example within the **Programme *Regions in Growth,*** funded by the Just Transition Fund and focused on the transition to RES, upgrading to a higher energy class, usage of green technologies. Assist energy poor household and vulnerable consumers in obtaining financial aid for the installation of RES, using the **National Recovery and Resilience Plan**, or other programmes.
Scheduling	2025 and later on

Budget	**All stakeholders:** NGOs, local municipalities
Drivers	The obligation for transitioning to RES and to reduce pollution.
Barriers	Installation of RES has a high upfront cost, which makes it unaffordable for energy poor household and vulnerable consumers

Action under the policy sector: Energy communities/ cooperatives **Advocate legislative changes in order for RED II to be transposed in the National law.**	
The responsible entity and leading person	**Bulgarian Academy of Sciences**, Council of Ministers, all stakeholders.
The target group for the action	All energy consumers
Project design and documentation	**Advocate legislative changes in order for RED II** to be transposed in the National law. In the Law should be included incentives for the energy communities' development based on their potential for greater social impact.
Scheduling	2023 - 2026
Budget	Not applicable
Drivers	The obligation to facilitate the creation of energy communities and cooperatives.
Barriers	This is a legislative change, thus it will take a long time to be implemented.

Action under the policy sector: Energy communities/ cooperatives **Promote the establishment of energy cooperatives**

The responsible entity and leading person	**Municipalities**; Ministry of Energy; Ministry of Labour and Social Policy; NGOs; energy providers.
The target group for the action	All energy consumers.
Project design and documentation	Promote the establishment of **energy cooperatives,** at least one for every one of the larger municipalities. The action should also foresee energy poverty mitigation on local level.
Scheduling	2023 - 2033
Budget	Municipal funding when available.
Drivers	The obligation to facilitate the creation of energy communities and cooperatives.
Barriers	This is a legislative change, thus it will take a long time to be implemented.

Action under the policy sector: Crowdfunding	
The responsible entity and leading person	**SEA SOFENA and Energy Agency Plovdiv**; other NGOs; local municipalities.
The target group for the action	All energy consumers.
Project design and documentation	Advocate, facilitate, and network to support energy communities to secure funding for their projects using crowdfunding.
Scheduling	2023 - 2026
Budget	No budget
Drivers	This is the way to finance something, which cannot be paid for otherwise.
Barriers	The existing legislation has to be modified in order to regulate properly crowdfunding.

Action under the policy sector: Education about Energy Poverty

Promote the energy poverty topic as a research field and a study subject in universities' curricula.	
The responsible entity and leading person	Ministry of Education, Bulgarian Academy of Sciences
The target group for the action	University students
Project design and documentation	Energy poverty specialists have to work in cooperation with the Academia in order to design appropriate programmes, related to the topic.
Scheduling	2030
Budget	none
Drivers	The need to educate specialists in energy poverty in many different scientific fields.
Barriers	Academic programmes are not changed easily, nor quick.

Action under the policy sector: Education about Energy Poverty **Education about Energy Poverty in high schools programmes, especially vocational high schools.**	
The responsible entity and leading person	Ministry of Education, SEA SOFENA, other NGOs.
The target group for the action	School students interested in the area of energy poverty.
Project design and documentation	Encourage education about **Energy Poverty in high schools** programmes, especially vocational high schools, organise extra curricula activities focused on energy poverty alleviation.
Scheduling	2030
Budget	none
Drivers	The need for trained specialists on Energy poverty.

Barriers	High schools' programmes are not changed easily, nor quick. There would be a lack of suitable teachers.

Action under the policy sector: Awareness-raising campaigns **Organise awareness-raising campaigns**	
The responsible entity and leading person	**SEA SOFENA;** local administrations; EPAOs; other stakeholders.
The target group for the action	All citizens.
Project design and documentation	**Organise awareness-raising campaigns** to increase public awareness regarding energy poverty; involve local energy poverty alleviation offices in local campaigns; promote existing online tools that would help citizens and interested parties to access information about energy efficiency and energy poverty.
Scheduling	2023 - 2033
Budget	None
Drivers	The need to increase public awareness about energy poverty.
Barriers	Lack of interest and shortage of resources on the part of local administrations.

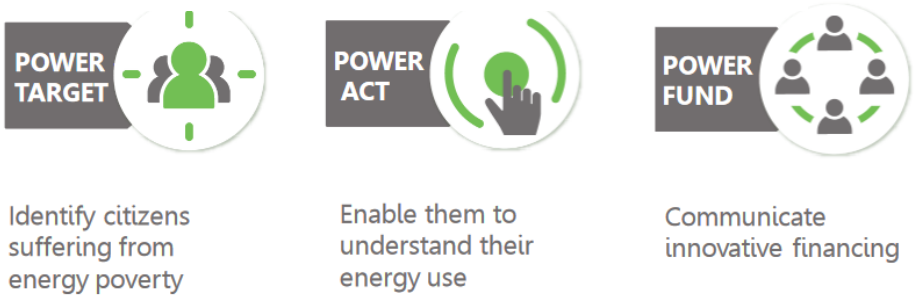
Action under the policy sector: Awareness-raising campaigns **Training sessions for vulnerable households about energy poverty**	
The responsible entity and leading person	**SEA SOFENA;** local administrations; EPAOs; other stakeholders
The target group for the action	All citizens

Project design and documentation	**Organise training sessions** for vulnerable households about energy poverty and possibilities for energy efficiency optimisation. **Promote** the POWERPOOR EPAOs.
Scheduling	2023 - 2033
Budget	None
Drivers	The need to educate about energy poverty especially these citizens who are in an energy poverty situation/ or who are at risk.
Barriers	Lack of interest and shortage of resources on the part of local administrations.

Action under the policy sector: POWERPOOR network **Foster further development of the POWERPOOR network of Energy Mentors and Supporters.**	
The responsible entity and leading person	**SEA SOFENA; POWERPOOR Energy Supporters and Mentors network**
The target group for the action	Energy poor households and vulnerable citizens
Project design and documentation	Continue promoting and expanding the POWERPOOR network in Bulgaria, collaborate with the global POWERPOOR network. Promote the POWERPOOR toolkit as an easy access means to get quality advice on energy issues, as an instrument for energy poverty mitigation.
Scheduling	2023 - 2033
Budget	none
Drivers	The need to tackle energy poverty through support and mentoring.
Barriers	none

The POWERPOOR toolkit is incremental to the implementation of the individual actions and should be used actively by whichever stakeholder (e.g. municipality or POWERPOOR partner) has been identified, in the previous steps, as being responsible for implementation.

Figure 8 POWERPOOR Toolkit



Step 5: Monitor & Evaluate

One year after completion of the POWERPOOR project (or any other timeframe decided upon during the stakeholder consultations), the first monitoring & evaluation process should take place to see whether the roadmap's actions, and ultimately its vision, are being met. The exact indicators to be reviewed will depend on which ones have been chosen in Step 2.

Please fill out this table:

Table 10 Bulgaria Action-Specific Indicators

Indicator	**Baseline (2022)**	**Target (date dependent on the action)**
Definition of Energy Poverty	Under development	Jan. – Feb. 2023
Energy Poverty alleviation measures in the SECAPs and other Energy Efficiency, RES transition, and Climate related municipal programmes.	Insignificant	2024 30% of existing and newly defines Plans have a dedicated chapter

Replacement of old wood and coal heating devices with new ecological options in energy poor households and vulnerable consumers.	n/a	2024 No less than 6 000 households have their appliances replaced
Energy efficiency renovation of multi-family buildings.	7% of the living space in Bulgaria is class A or B.	2024 No less than 1200 buildings have increased their energy efficiency to class B.
Operation of energy advisory services (POWERPOOR Energy Poverty Alleviation Offices)	2	2023 increased number of Energy Poverty Alleviation Offices by 50%
Transpose RED II into National Law	n/a	2023
Capacity building and networking support programmes to energy communities	n/a	2024 under development

This table tracks the progress of general energy poverty indicators leaning on the categorization provided by EPAH.

Table 11 Bulgaria General Energy Poverty Indicators

Indicator	**Baseline (2022)**	**Target (date dependent on previous table)**
Arrears on utility bills % of population / per year	19.2 %	30 % reduction
Households unable to keep home adequately warm per year	23. 7%	30 % reduction
Population living in dwellings with leak, damp, rot	11%	30 % reduction

Population at poverty risk	32.1 %	30 % reduction
Existence of energy poverty strategy	no	yes
Awareness-raising campaigns targeting vulnerable households	no	yes

Recommendations on how to implement the national roadmap

The above process will have resulted in a national roadmap which has been co-created with a diverse group of stakeholders from the POWERPOOR National Stakeholder Liaison Groups. Following the national policy dialogues and consultations, partners will reflect on the roadmap drafting process and can suggest additional recommendations to specific stakeholder groups on HOW the above-listed actions can be implemented. Recommendations are aimed at the following groups and are included below:

For Sub-National Governments

Municipalities should adopt the national definition of energy poverty, apply the measures for alleviating energy poverty prescribed by the government, and provide feedback on the specific characteristics of the phenomenon.

Municipalities should incorporate a chapter on measures for energy poverty mitigation in their SECAPs, and also in their other Energy Efficiency, RES, and Climate Plans and Programmes.

Municipalities should try and create EPAOs within their structures, which should work in cooperation with their Social assistance team, with local building/ renovation companies, and with local electricity providers in order to be able to identify energy poor households and families at risk of energy poverty, and to tackle energy poverty in the most effective way.

Municipalities should provision the establishment of at least one energy cooperative within their territory, providing support, funds and assistance to the citizens.

For National Governments

To the **legislation of Bulgaria** should be added special regulations aimed at mitigating energy poverty, aligned with the EU policies for energy poverty alleviation, and serving the needs of the Bulgarians. The EC RED II should be transposed into National Law as soon as possible and serve as a basis for the establishment of energy communities/ cooperatives.

The Ministry of Energy should cooperate with the Ministry of Labour and Social Policy and with the Ministry of Regional Development and Public Works. This will allow them to optimise targeting procedures and data gathering procedures in order to establish a mechanism for continuous fine-tuning of the methodology for successful identification of energy poor households and families at risk of energy poverty.

Ministry of Labour and Social Policy in cooperation with the Ministry of Energy and with the Ministry of Regional Development and Public Works should design and endorse a special agency for energy poverty mitigation, which would include experts from all three Ministries and would be able to tackle energy poverty not only as variant of poverty, but also as result of poorly isolated dwelling and subsequently of lack of energy efficiency, therefore would be able to meet the needs of energy poor citizens in more comprehensive way.

The **Ministry of Labour and Social Policy** through its **Agency for Social Assistance** should keep a separate record of energy poor households, should employ experts to provide the citizens with guidance on possible measures for increasing of energy efficiency, on energy related funding opportunities, and/ or send the citizens to the local EPAOs, if possible**.**

The **Ministry of Regional Development and Public Works** should give priority to energy poor households when planning and introducing Programmes for Energy optimisation of houses, and others.

Targeted building renovation financing schemes, that address specific needs of energy poor households, need to be designed and provided. The government should secure funds for up to 100% grants for energy poor households in need of house optimisation, instalment of RES, etc. in order to facilitate just energy transition.

Special **(financial) incentives** should be designed in order to encourage energy poor households to participate in collective/ community energy actions.

The **Ministry of Education** should introduce in the schools curricula, especially the vocational schools curricula, the topic of energy poverty, and should encourage Universities and research organisations to promote the topic as a research field.

For Civil Society

The civil society organisations need to contribute to the dialogue about the legislation related to the **establishment and functioning of energy communities**, by providing insights about the challenges various social groups may face.

The civil society organisations should provide assistance to the process of establishment of EPAOs in order to facilitate local and personalised assistance to the energy poor households.

The civil society organisations should contribute further to the expansion of the POWERPOOR network of energy supporters and mentors, who work on the ground with energy poor households.

NGOs and civil society organisations together with the municipalities should have a leading role in campaigns for public awareness, activating their networks, in order to adjust the agendas of the campaigns to local needs/ preferences, thus, to maximise the impact of these campaigns.

For the Private Sector

Energy providers should work in cooperation with the Ministry of Labour and Social Policy in order to guarantee preferential treatment, social tariffs, and other assistance to energy poor households**.**

Building companies should adopt the latest requirements for the energy efficiency of residential buildings, and should have an expert on site who can assist energy poor households and discuss with them all possible financial schemes.

Energy appliances companies (household appliances, heating devices, cooling devices) should provide consultation on energy efficiency and on available financial aid for energy efficiency for citizens; they should work in cooperation with Energy Poverty Alleviation Offices in order to secure help for households in risk of energy poverty.

7. National Energy Poverty Mitigation Roadmap of Croatia

Introduction

In the POWERPOOR project, partners are actively assessing causes of energy poverty and suggest short-term and collective energy action solutions to mitigate this problem. A highly diverse network of Energy Supporters and Mentors has been trained and is being engaged to further support energy poor households to implement solutions. The project also sets up Local Energy Poverty Mitigation Offices in engaged municipalities. POWERPOOR strives to trigger high-impact change, not only on the local and regional level, but also on the national and European level. Such a multi-level governance approach will result in long-lasting impact and coordination between local needs and national (e.g., National Energy and Climate Plans) and supra-national enabling frameworks.

The aim of the national roadmaps is then to build on current project activities and to enable the application of the POWERPOOR approach to promote integrated energy poverty mitigation policies across all regions and cities within the pilot countries. This roadmap is a synthesis exercise based on several outputs of the Work Packages and is to be used by project partners and Energy Supporters & Mentors during the last year of the project and beyond its lifetime (also possibly to be incorporated into future Horizon projects).

Next to the project national partners, stakeholders out of the network of Energy Supporters and Mentors, especially those at the National Liaison Groups, were invited, to take ownership of the national roadmaps and take the process forward. This work resulted in lessons-learned, which, in turn, generate policy recommendations on how the national regulatory / incentive framework should be adapted to mitigate energy poverty in the first place.

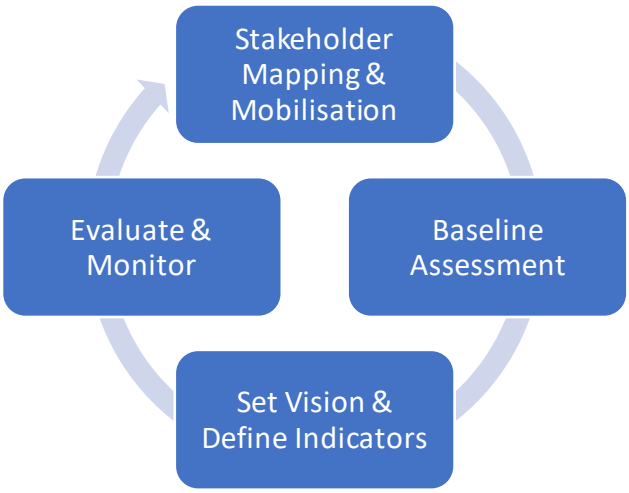
What is the methodology for the national roadmaps?

The development and adoption of the national roadmap is subdivided into two phases, which each encompasses specific steps on an integrated management cycle (adapted from ICLEI Green Climate Cities Programme). The cycle has been chosen as a basis for the roadmap since it promotes a holistic approach to policy making.

Phase 1 takes place until the end of the POWERPOOR project and includes steps which shall be carried out by partners and Energy Supporters and Mentors until then. Phase 2 takes place within one year after the project, or on any other timeline decided by the

partners and stakeholders. Once the cycle has been completed a first time, the process can be repeated (and could potentially serve as a basis for future projects).

Figure 9 Roadmap Methodology



Adapted from ICLEI Green Climate Cities Handbook 2016

National Roadmap Development

Phase 1

The following three steps correspond largely to the activities carried out within the POWERPOOR project and rely strongly on the findings of Deliverable 4.2 "Baseline Assessment Report". They form the basis for the national roadmaps and for the subsequent steps of Phase 2.

Step 1: Stakeholder Mapping, Commitment & Mobilization

As part of D4.1, project partners have carried out an initial assessment of stakeholders who are part of the National Liaison Groups, have created an overview of the expectations the different stakeholders have towards the project as well as their influence and level of expertise. As part of the roadmapping process, it becomes important to identify the relative importance of particular stakeholder groups vis-a-vis energy poverty mitigation and to identify how flexible stakeholders are to adapt their everyday (business) practices and what kind of networks exist between them. The stakeholder universe methodology, as presented in Module 4 lends itself well for this.

This exercise should was done together during the stakeholder consultations and is aimed at understanding stakeholder relations, to identify possible disconnection, flows of knowledge/resources and power. "Tackling energy poverty" is the main star, stakeholders with the highest interest (to mitigate energy poverty), are closer to it. Flexible stakeholders are placed above the x-axis, non-flexible stakeholders beneath. Stakeholders placed closer to each other have a closer working relationship. Once this is mapped out, connect stakeholder to depict fluxes of resources, money or others. Spot potential clusters of interest and identity as well as critical stakeholders, which link clusters and act as "gatekeepers" or knowledge brokers. Then the network was analysed.

In D4.1 and D4.2 an analysis of stakeholders and their involvement in POWERPOOR and Liaison Group was made.

In Croatia, 78 stakeholders are identified by the partner DOOR. 9 organisations were invited and accepted to join POWERPOOR Liaison Group - first meeting. And 9 organisations were invited to second meeting POWERPOOR Liaison Group.

Figure 1 Stakeholders in Croatia per target group

Table 12 Liaison Group members in Croatia per target group – first meeting

Liaison groups representatives per target groups	Number of representatives

Regional Authorities	1
Local Authorities	2
Civil Society	3
SMEs	2
Academia	1

Table 13 Liaison Group members in Croatia per target group – second meeting for National roadmap

Liaison groups representatives per target groups	Number of representatives
Local Authorities	2
Civil Society	4
Energy services company	1
Academia	2

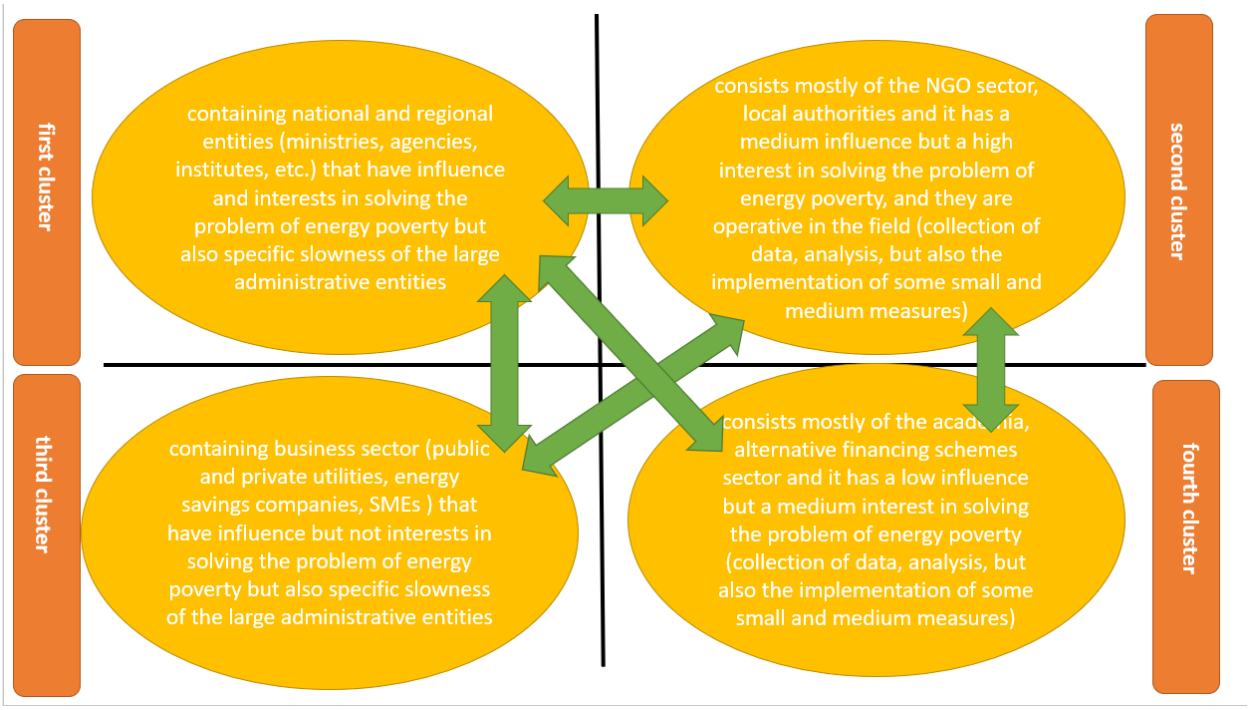
Stakeholder mapping done for D4.1 was used as a basis to co-create the stakeholder universe. The methodology was slightly adapted to work best for the Croatian context. Out of 78 stakeholders that are identified we can differentiate four potential clusters of interest:

- the first cluster containing national and regional entities (ministries, agencies, institutes, etc.) that have influence and interests in solving the problem of energy poverty but also specific slowness of the large administrative entities;
- the second cluster, consists mostly of the NGO sector, local authorities and it has a medium influence but a high interest in solving the problem of energy poverty, and they are operative in the field (collection of data, analysis, but also the implementation of some small and medium measures)
- the third cluster containing business sector (public and private utilities, energy savings companies, SMEs) that have influence but not interests in solving the problem of energy poverty but also specific slowness of the large administrative entities
- the fourth cluster containing mostly of the academia, alternative financing schemes sector and it has a low influence but a medium interest in solving the

problem of energy poverty (collection of data, analysis, but also the implementation of some small and medium measures)

The stakeholders were mapped according to their interest and influence - and four clusters were created - during the online stakeholder consultation of the roadmap, taking into account the clusters and the proposed measures, a connection was made between the clusters for the final version of stakeholder universe.

Figure 10 Croatia Stakeholder Universe



First cluster containing national and regional entities (ministries, agencies, institutes, etc.) whose role is to pass a law and measures to help vulnerable households and also energy-poor households by developing support schemes for energy transition and distributing national and EU funds. They have highest impact but their interest varies on political and economic situations in the country and most often includes short-term solutions, which is a problem in solving of energy poverty. This is why they are placed on the grid in a part of high impact but of less interest than the second cluster - and are considered one of the least flexible body.

Second cluster consists of highest interest stakeholder in tackling energy poverty - civil society organizations – they are mostly financed from EU funds for implemented activities related to energy poverty. Local authorities mostly cooperate with civil society on the issue of energy poverty due to ability of civil society to adapt to the local needs

and the variety of solutions they can provide. Civil society and especially local authorities have a significant potential to help vulnerable households. With joint effort even the low-income families can have access to EE and RES or other source which can help them to break out of energy poverty.

First cluster is connected to second cluster mostly in the exchange of experience and knowledge and capacity building. Civil society often have new data and interesting discoveries from the field that the ministries from the first cluster can use for co-designing future policies - for example, this National roadmap is a document that can be interesting for the first cluster and was created by the second cluster of stakeholders.

Third cluster of stakeholders are located below the axis X and the stakeholders who belong to this group have the least interest in solving energy poverty but their impact can be great. By creating the right measure for third cluster of stakeholders (public and private utilities, energy savings companies, SMEs) like establishing the OSS which is one of the proposed measures in this roadmap the stakeholders of this cluster could be more involved in solving the problem of energy poverty.

Third cluster is connected to first and second cluster. The inflexibility of the first cluster is transferred to the third cluster and can be considered the cause of the inflexibility of the third cluster - like energy providers (third cluster), as one of the most significant players are tied to national regulations bodies (first cluster) - making them one also one of the least flexible body. But by connecting the third cluster with the first cluster through the measure of establishing OSS interest can be increased, thus the impact they already have can be focused on energy poverty - and the inflexibility of the first and third clusters can be overcome.

Fourth cluster of stakeholders are also located below the axis X and the stakeholders who belong to this group have the medium - high interest in solving energy poverty but their impact can be medium to low. It is mostly academia and technical universities that through the energy poverty project with civil society organizations implement activities to alleviate energy poverty

The fourth cluster is connected to the second cluster through POWEROOR. But through other obligations fourth cluster has a strong connection with the first and third clusters and that is why they are a good partner for civil society.

The key takeaways from the stakeholder modelling are the following:

- When designing measures and policies, the first cluster should include all other clusters in the working group.

- Civil organizations work closely on the issue; therefore they have the right expertise and flexibility in providing help. They have a significant impact on micro level.
- Local authorities and civil society have a significant potential to help vulnerable households - that's why it's recommended that Local energy poverty mitigation offices (like POWERPOOR offices) are opened in cooperation with local authorities

Step 2: Baseline Assessment

Since the analysis of D4.2 Baseline assessment report was made in April 2021 energy crisis has already taken root in the 2021 pandemic year when the price of four energy sources went up. However, the increase in prices in 2021, possibly caused by the Covid-19 pandemic was not felt by Croatian citizens because the government was able to cope with these prices through various mechanisms. The Russian invasion of Ukraine in February 2022 put additional pressure on the increase of energy prices, and energy prices could no longer be contained by the government and both increase in prices from 2021 and 2022 started to affect the citizens. Four factors affect the energy crisis in Croatia: inflation, war in Ukraine, Croatian entry into the Eurozone and COVID-19 pandemic. The Croatian government's response to the energy crisis in 2022 went in two directions: limiting the prices of energy and changing existing policies.

Many changes in policies have occurred in 2022 in comparison to the 2021 analysis in D4.2 of the Baseline Assessment Report among them the important change for POWERPOOR is **introduction of the concept of energy poverty in policies** (but not yet the national definition of energy poverty) and **passing policies** that promote **community-ownership of energy** and **collective finance / crowdfunding.**

Table 14 Croatia Baseline Assessment Revision

National Energy and Climate Plans (NECPs)	Passing **Program for mitigation of energy poverty, which includes the use of renewable energy sources in residential buildings in areas of special state until 2025**[1]
The building sector - renovation efforts	**Long-term strategy for the renovation of the national building stock until 2050 – Decision (Official Gazette, No. 140/2020)**[2]

[1] https://narodne-novine.nn.hr/clanci/sluzbeni/2021_12_143_2446.html
[2] https://narodne-novine.nn.hr/clanci/sluzbeni/2020_12_140_2704.html

	National recovery and resilience plan (NPOO)[3] - consists of five components and one initiative- Economy, Public administration, judiciary and state property, Education, science and research, Labour market and Social protection and health and the Building renovation initiative. Most of the grant in the building sector part will be directed toward the renovation of buildings damaged in the earthquake including energy renovation. **Program for mitigation of energy poverty, which includes the use of renewable energy sources in residential buildings in areas of special state until 2025 (Decision (Official Gazette, No. 143/2021)[4] -** introduces the concept of energy poverty, but not the national definition of energy poverty. HRK 150 million (19.957.418 €) from **National recovery and resilience plan (NPOO)** and HRK 205 million (27.275.139 €) from the state budget are planned for the entire implementation of the Program in the implementation period. The program covers the renovation of 387 residential buildings (but 413 buildings are listed in the table) and 100% of the renovation costs are planned to be financed. The program opened a public call and implementation started for 7 out of 32 buildings in Lički Osik and another 80 in other local communities are planned for 2022/2023. **Program for energy renovation of family houses for the period 2014 - 2020 - "Decision on the extension of financing in 2021 for the implementation of the Program for energy renovation of family houses for the period from 2014 to 2020 with a detailed plan for the period until the end of 2020 (Official Gazette, No.**

[3]https://planoporavka.gov.hr/UserDocsImages/dokumenti/Plan%20oporavka%20i%20otpornosti%2C%20srpanj%202021..pdf?vel=13435491

[4] https://narodne-novine.nn.hr/clanci/sluzbeni/2021_12_143_2446.html

	183/2021"[5] - as part of this program, 3 public calls for family houses and 2 special calls have been announced since 2014– 1 for energy poor households and 1 for households affected by the earthquake[6]). **"Public call for energy renovation of family houses for vulnerable groups of citizens at risk of energy poverty"[7]** was opened in 2020, included only citizens already targeted by welfare system and excluded other categories of a vulnerable group of citizens and citizens at risk of energy poverty or energy poor citizens. The funds are provided by the Financial Plan (ETS system) of The Environmental Protection and Energy Efficiency Fund. **Program for energy renovation of multi-apartment buildings for the period up to 2030 - Decision (Official Gazette, No. 143/2021)[8] -** introduction the concept of energy poverty, but not the national definition of energy poverty. The first Public call[9] from this program was opened in April 2022. In previous program that lasted from 2014-2020 there was only one Public call in 2015.
Social care	**The Guaranteed Minimal Support programme (Social Welfare Act (Official Gazette, No. 157/13, 152/14, 99/15, 52/16, 16/17, 130/17, 98/19, 64/20, 138/20)[10] -** The guaranteed minimum financial assistance is used for housing costs which include rent, utility bills, electricity, gas, heating, water, drainage, etc. The right to a guaranteed minimum financial assistance is granted to a single

[5] https://narodne-novine.nn.hr/clanci/sluzbeni/2021_07_83_1528.html
[6] https://www.fzoeu.hr/hr/natjecaj/7539?nid=196
[7]https://www.fzoeu.hr/docs/javni_poziv_za_financiranje_energetske_obnove_obiteljskih_kuca_za_ranjive_skupine_gradana_u_opasnosti_od_energetskog_siromastva_v1.pdf
[8] https://narodne-novine.nn.hr/clanci/sluzbeni/2021_12_143_2444.html
[9]https://mpgi.gov.hr/vijesti-8/objavljen-poziv-za-energetsku-obnovu-visestambenih-zgrada-neostecenih-u-potresu-prvi-poziv-u-okviru-npoo-a/14463
[10] https://www.zakon.hr/z/222/Zakon-o-socijalnoj-skrbi

	person or a household that does not have enough funds to meet basic life needs. **Decision on the basis for calculating the amount of the minimum[11] fee (Official Gazette, No. 157/2013) -** shows the decision that the basis for calculation the amount of the guaranteed minimum compensation is HRK 800 (€106.5). **Regulation on the criteria for acquiring the status of vulnerable energy customers from network systems (Official Gazette, No. 120/12, 14/14, 95/15, 102/15, 68/18, 31/22)[12] -** in which the criteria for acquiring the status of a vulnerable customer of energy from network systems are established. Furthermore, solidarity compensation is described as a means of reducing the energy poverty of vulnerable customers. The tasks of the supplier and the competent centre for social welfare are described. **Conclusion regarding compensation for reducing the impact of rise in energy prices on nursing homes (Official Gazette, No. 100/2020)[13] -** The compensation was HRK 400(53,09€), but increased again October 1, 2022, it amounts to HRK 500(66,36 €). **"Zagreb strategy for the fight against poverty and social exclusion for the period from 2021 to 2025"[14] -** Measure for energy poverty is: ensuring energy packages (box) for beneficiaries of the right to compensation for housing costs.

[11] https://narodne-novine.nn.hr/clanci/sluzbeni/2014_09_114_2172.html
[12] https://narodne-novine.nn.hr/clanci/sluzbeni/2022_03_31_374.html
[13] https://narodne-novine.nn.hr/clanci/sluzbeni/2022_09_104_1528.html
[14]http://web.zagreb.hr/Sjednice/2017/sjednice_skupstine_2017.nsf/0/C12581370033D600C1258680004E6002/$FILE/04%20Strategija.pdf

Policy to promote community-ownership of energy	**"Electricity Market Act (Official Gazette, No. 111/2021)"**[15] – definition of Citizen Energy Community (CEC) - for practical establishment and operation of CEC there is need to adopt by-laws that will define the details related to their establishment and operations. **"Renewable Energy Sources and High-Efficiency Cogeneration Act No. 138/2021)"**[16] **-** definition of Renewable Energy Community (REC). **"Act on Cooperatives (Official Gazette, No. 34/11, 125/13, 76/14, 114/18, 98/19)"**[17] **-** there is no need for definition of an energy cooperative, it can be established according to the principle of already existing act.
Policy to promote (collective) finance / crowdfunding	**"Act on the implementation of Regulation (EU) 2020/1503 on European crowdfunding service providers (Official Gazette, No. 144/2021)"**[18]
The energy market (e.g. social tariffs / tax incentives)	**"Regulation on the monthly amount of compensation for vulnerable energy buyers, the method of participating in the settlement of the costs of energy users of the compensation and the actions of the Croatian Institute for Social Work (Official Gazette, No. 104/2022)"**[19] **- "energy vouchers". -**The compensation for the vulnerable customer was HRK 200 (26.63 €), but due to the increase in prices, from April 1, 2022, it amounts to HRK 400 (53.25 €). That decision is valid until March 31, 2023. The compensation for the vulnerable customer was HRK 400 (53.09€), but increased again on October 1 2022, it amounts to HRK 500 (66.36 €).

[15] https://narodne-novine.nn.hr/clanci/sluzbeni/2021_10_111_1940.html
[16] https://narodne-novine.nn.hr/clanci/sluzbeni/2021_12_138_2272.html
[17] https://www.zakon.hr/z/64/Zakon-o-udrugama
[18] https://narodne-novine.nn.hr/clanci/sluzbeni/2021_12_144_2458.html
[19] https://narodne-novine.nn.hr/clanci/sluzbeni/2022_09_104_1521.html

	"Agreement on cooperation on measures to combat energy poverty from 2015"[20] - the signatories of these contracts are the 3 largest suppliers in CRO - HEP, RWE and GEN-I and it is connected to so-called Solidarity Fee of HRK 0.03/kWh of electricity consumed that is added to a household's energy bill, but in the end it is not paid by the costumers, but by the electricity suppliers who signed the decision that they will pay that amount on behalf of the customer and that this amount will be used as an achieved indicator under Article 7 of the Energy Efficiency Directive (now Article 8). The amount is paid into the state budget, and money from the state budget is directed to the Croatian Ministry of Demography, Family, Youth and Social Policy for "energy vouchers". The amount paid to the Ministry from the state budget depends on the number of beneficiaries of the Guaranteed Minimal Support programme. **"Decision on the payment of a one-time cash payment to pension beneficiaries in order to mitigate the consequences of price increases (Official Gazette, No. 104/200)"[21] -** A one-time decision on the energy compensation for 690,000 pensioners with a pension of up to HRK 4,360 (€578.67). Value of the measure is HRK 450 million (€59.7 million). **„Decision on the payment of a one-time cash payment to children's allowance beneficiaries in order to mitigate the consequences of the increase in energy prices (Official Gazette, No. 104/2020)[22] -** A one-time decision on the energy

[20]https://vlada.gov.hr/UserDocsImages/Vijesti/2015/rujan/14%20rujan/Sporazum%20o%20suradnji%20na%20mjerama%20suzbijanja%20energetskog%20stanovni%C5%A1tva.pdf
[21] https://narodne-novine.nn.hr/clanci/sluzbeni/2022_09_104_1524.html
[22] https://narodne-novine.nn.hr/clanci/sluzbeni/2022_09_104_1523.html

	compensation for to the beneficiaries of the child support. The amount depends on the number of children. **"Decision on the amount of tariff items for guaranteed electricity supply (Official Gazette, No. 100/200)"[23] -**new category (before there were only 2 categories, households and business, and now there are 3 categories, households, business and public). Refers to: kindergartens, schools, faculties, institutes, libraries, museums, hospitals, health institutions, homes for the elderly and infirm, etc., associations, religious communities, parish offices, etc., municipalities, cities, counties, utility companies - water supply and drainage. **"Decision on the amount of the fee for the use of space used by production plants for the production of electricity (Official Gazette, No. 84/2013, 101/2013, 72/2015)"[24] -** The owners of production facilities for the production of electricity are obliged to pay compensation to local government which should be used for social welfare programs. **"Regulation on the obligation system of energy efficiency (Official Gazette, No. 41/2019)"[25]** **"Value Added Tax Act" (Official Gazette, No. 73/13, 99/13, 148/13, 153/13, 143/14, 115/16, 106/18, 121/19, 138/20, 39/22, 113/22)"[26] -** amendments to lower the VAT rate to 5% for the delivery of heating from thermal stations, and the delivery of firewood, pellets, briquettes and wood chips. That decision is in effect until March 31, 2023. A VAT rate of zero percent is being introduced for the delivery and installation of solar

[23] https://narodne-novine.nn.hr/clanci/sluzbeni/2022_08_100_1474.html

[23]https://www.hep.hr/elektra/UserDocsImages/dokumenti/tarife/kucanstvo/Uredba_VladeRH_01102022/Tarife_stavke_zajamcena_od_01-07-2022_do_01-10-2022.pdf

[24] https://narodne-novine.nn.hr/clanci/sluzbeni/2013_07_84_1869.html

[25] https://narodne-novine.nn.hr/clanci/sluzbeni/2019_04_41_847.html

[26] https://www.zakon.hr/z/1455/Zakon-o-porezu-na-dodanu-vrijednost-

	panels on private residential buildings, residential premises, and public and other buildings. No limited time on 0% VAT for solar systems.
Consumer protection	**"Regulation on the criteria for acquiring the status of a protected customer in conditions of crisis situations in gas supply (Official Gazette, no. 65/2015)"[27]** -A law establishing criteria for protected consumers and related measures to ensure reliable supply to these customers. Protected consumers have the right to be supplied with gas in case of crisis conditions for security reasons, possible threat to life, work status and other social reasons. **Regulation on the criteria for acquiring the status of vulnerable energy customers from networked systems (Official Gazette, number: 120/12, 14/14, 95/15, 102/15, 68/18, 31/22)"[28] –t**he definition of the status of "vulnerable customer" was expanded at the time of the energy crisis. **"Decision on write-off of debts to natural persons up to a maximum amount of HRK 5,000.00 for the principal of the debt and expenses, increased by the associated interest"[29] -** A one-time policy to write-off unpaid debts, interest and other related costs, including energy debts to unblock a person's energy account, up to a total of HRK5000 by Hrvatska elektroprivreda (HEP). For the general public, there was one public call in 2018, and now it is valid only for the part of Croatia affected by the earthquake in 2020 - Sisak - Moslovina County.
SECAPs	**"Action Plan for Energy and Climate Sustainable Development (SECAP)- Osijek"[30]** -

[27] https://narodne-novine.nn.hr/clanci/sluzbeni/2015_06_65_1239.html
[28] https://narodne-novine.nn.hr/clanci/sluzbeni/2022_03_31_374.html
[29] https://www.hep.hr/elektra/obavijest/poziv-za-podnosenje-zahtjeva-za-otpis-duga/1593
[30]https://door.hr/usvojen-secap-akcijski-plan-energetski-i-klimatski-odrzivog-razvitka-grada-osijeka/

	Energy poverty measures are also included in the SECP: Measure 1: Co-financing of energy renovation of family houses for vulnerable groups of citizens at risk of energy poverty. Measure 2: Small EE measures for vulnerable groups of citizens at risk of energy poverty. **"Action Plan for Energy and Climate Sustainable Development (SECAP)- Zadar"[31] -** Energy poverty measures are also included in SECP: Measure 1: Co-financing of energy renovation of family houses for vulnerable groups of citizens at risk of energy poverty. **"Action Plan for Energy and Climate Sustainable Development (SECAP)- Rijeka"[32] -** Energy poverty measures are also included in the SECP: Measure 1: Co-financing of energy renovation of family houses for vulnerable groups of citizens at risk of energy poverty. Measure 2. Establishment of a centre for energy consulting and assistance to the energy poor households.

Step 3: Set Vision, envision Actions and define Indicators

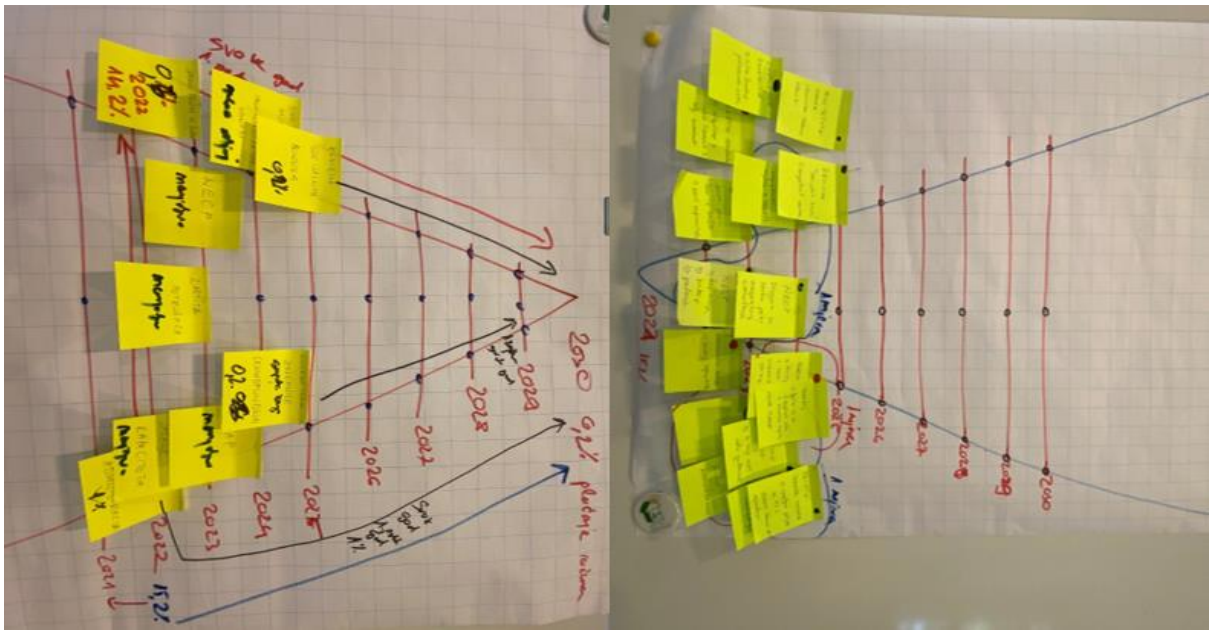
Now that the stakeholders have been gathered, committed and the national regulatory context reassessed, it was time to foster a common understanding on what alleviating energy poverty actually means for the different stakeholder groups. During the stakeholder consultation, a concrete vision for energy poverty mitigation was created. The future radar methodology lends itself well for this purpose. Discussions on the possible actions took place based on a common reference scenario (the vision).

By applying this tool, it was possible to plan policy actions equipped with a global overview of the milestones to achieve, coupled with their feasibility and the influence you can put on them to happen. The second "cone" presented a detailed plan of actions to implement to achieve the changes envisaged in the first "cone". In the table below, the co-created actions from the second "cone" are indicated.

[31] https://door.hr/usvojen-je-akcijski-plan-energetski-i-klimatski-odrzivog-razvitka-grada-zadra/
[32]https://www.rijeka.hr/wp-content/uploads/2020/10/Informacija-o-provedbi-savjetovanja-s-javno%C5%A1%C4%87u-o-Nacrtu-prijedloga-akcijskog-plana-odr%C5%BEivog-energetskog-razvoja-i-prilagodbe-klimatskim-promjenama-Grada-Rijeke-SECAP.pdf

Reflecting to the Stakeholder universe graph, Liaison group created a model called Future radar. In the top cone, Liaison group have formulated a vision that arrears on utility bills will be reduced by 9% until 2030. In 2021 arrears on utility bills in Croatia is 15.2% while EU27 is 6.2% - our goal by 2030 is to reach the EU level from 2021.

Figure 11 Croatia Future Radar



Stakeholders in Liaison group felt it was important to implement all measures as soon as possible, so all policy recommendations seemed to be urgent and to be implemented by 2025 to reach target of arrears on utility to be 6,2% until 2030.

The Liaison Group emphasized problems before proposing measures that would affect the proposed indicator like:

- the problems are lack of definition of energy poverty on national level and lack of criteria on energy poverty on national level.
- "Public call for energy renovation of family houses for vulnerable groups of citizens at risk of energy poverty" opened in 2020 included only citizens already targeted by welfare system and excluded other categories of vulnerable group of citizens and citizens at risk of energy poverty or energy poor citizens
- there is interest in the Program and Public calls, but most citizens are concerned about too complicated administrative paperwork and application
- lack of funds due to the number of interested applicants – citizens are not sure if they want to invest money and time again to apply for a next call but they are not sure if they would go into reconstruction with their own 100% funds without the

help of the state

- an unregulated market and unresolved property-legal relations contribute to the problem of lack of national data and the market operating in the shadow zone.
- biggest inconvenience for citizens is to collect more than 50% of co-owners' signatures to be able to apply and go for subsidized renovation, because most of the apartments are rented and landlords are not interested in investing in the apartments they rent.
- existing legal framework does not enable the establishment of energy communities, which can be one of the measures to solve energy poverty

Table 14 provides a detailed overview of 11 measures proposed by Liaison Group that should contribute to the specified targeted indicator.

Although on the model it seems like all the interventions should take place in the next 4 to 5 years, take into consideration that some policies/measures might take several years to complete. For an example of the methodology we used in the validation of the measure – eg. deep renovation of the buildings nationwide might take 20-30 years, but it certainly needs to start now. In comparison with the baseline data on the indicator arrears on utility bills that is 15.2% and by 2030 we want to be on 6.2% we must decrease indicator by 9% and with a measure of deep renovation to achieve 0.5% renovation every year until 2030 - if we start from 2023, it would contribute 3.5% to decrease of the indicator by 2030. And it is only 1 of the 11 proposed measures.

Key takeaways from the future radar models are:

- Positive changes in political attitude would enhance the fight against energy poverty
- Deep housing stock renovation need to continue on a higher pace nationwide
- Administrative paperwork and application must not be complicated
- More actions and regulation on resolving unregulated market and unresolved property-legal relations
- Focus on establishing legal frameworks for establishment energy-communities

Table 15 Croatia Actions

Policy Sector	Actions to be implemented	By when?	By whom?

National Energy and Climate Plans (NECPs)	Revision of the NECP as an opportunity for inclusive energy poverty policy at the national level	Mid 2023	Ministry of Economy and Sustainable Development
Buildings	Financing renovation measures with 100% grant support	2027 and some ESF until 2032	Ministry of Economy and Sustainable Development Ministry of Spatial Planning, Construction and state property The Environmental Protection and Energy Efficiency Fund
Buildings	Establishment of one-stop shops to support energy renovation for energy poor households	2030	NGOs Energy agencies Local authorities
Buildings	Private rented sector – spreading awareness about renovation and encourage energy renovation to landlords	2030	Ministry of Economy and Sustainable Development Ministry of Spatial Planning, Construction and state property The Environmental Protection and Energy Efficiency Fund NGO
Buildings	Establishment of pre-grants to resolve property-legal relations before obtaining a grant for renovation	2030	Ministry of Spatial Planning, Construction and state property Ministry of Justice
Social care	Build more skills within the entities who are in contact with	2030	NGO

	people in energy poverty - activities to create education materials		
Policy to promote community-ownership of energy	Passing urgently laws, ordinances and other regulations and encourage activities to promote community-ownership of energy to citizens	2023	Ministry of Economy and Sustainable Development Croatian Energy Regulatory Agency NGO HERA
Policy to promote (collective) finance / crowdfunding	Encourage activities to promote crowdfunding campaign	2023	NGO
The energy market (e.g. social tariffs / tax incentives)	Revision of “social bonuses”,	2025	Ministry of Economy and Sustainable Development Ministry of Labour, Pension System, Family and Social Policy
Consumer protection	Passing urgently new regulation for better control on legally binding ban on disconnections for energy for poor households and vulnerable consumers	2024	Ministry of Economy and Sustainable Development Ministry of Labour, Pension System, Family and Social Policy Social welfare enters
SECAPs	SEACPs to included measures to reduce energy poverty	2023	Local authorities

Table 16 Croatia Action-Specific Indicators

Indicator	Baseline (2022)	Target (date dependent on actions
NEW revised NECP	last one from 2019	2023
No. of opened call for renovation with 100% grant support - each year starting with 2023	0	7 rounds of calls – each year 1 (from 2023-2030)
No. of established of one-stop shops	2	5 (2023-2030)
No. of events to raise awareness about renovation and encourage energy renovation for landlords	0	7 - each year 1 (from 2023-2030)
No. of opened call for resolving property-legal relations 100% grant support - each year starting with 2025	0	5 - each year 1 (from 2025-2030)
No. of events and/or no. of materials for capacity buildings for entities who are in contact with people in energy poverty	2	7 - each year 1 (from 2023-2030)
New laws, ordinances and other regulation for energy communities	0	N/A
No. of events to raise awareness of energy communities	2	14 - each year 2 (from 2023-2030)
No. of events to raise awareness about crowdfunding campaign	2	7 - each year 1 (from 2023-2030)
NEW revised “social bonuses”	last from 2022	2025
NEW regulation for better control from being disconnected from the network	last from 2021	2024
No. of new SEACPs to included measures to reduce energy poverty	4	7 - each year 1 (from 2023-2030)

Phase 2

Step 4: Implement Actions and apply POWERPOOR Toolkit

This is where the concrete actions, defined previously, are implemented according to the established timeline. For each action, a plan has been created.

Table 17 Croatia Action Overview

Revision of NECPs as an opportunity for inclusive energy poverty policy at the national level	
The responsible entity and leading person	Ministry of Economy and Sustainable Development The Environmental Protection and Energy Efficiency Fund Agency for legal transactions and real estate brokerage
The target group for the action	Energy poor households and vulnerable citizens
Action design	Opportunity for inclusive energy poverty policy at the national level - clearly defining the national definition of energy poverty, creating clear criteria for recognizing energy poor households, creating measures and monitoring the effect of these measures - Creating Program for alleviating energy poverty. National definition of energy poverty, creating clear criteria for recognizing energy poor households, creating measures and monitoring the effect of these measures. Using existing ICT tool like Energy Management Information System (ISGE) - the system is already established for public buildings and energy poor households and vulnerable citizens who receive a renovation grant should be obligate to enter the consumption of the

	3 years before and max 3 years after the renovation. Entering of the data will have to be taken over by either social workers or associations such as the Red Cross or Cartas due to weak IT literacy among vulnerable citizens.
Scheduling	2023
Budget	n/a
Drivers	Under the Fit for 55 package could be one of the much-needed steps to tackle energy poverty. Not only is the new Energy Efficiency Directive (EED) proposing the -55 % GHG target, but it requires Member States to almost double their annual energy savings obligations and address energy poverty, as well as to take other measures to deliver up to 13% more energy savings than foreseen under existing EU legislation. Using IT tools data will be up-to-date on housing renovation and long-term monitoring for vulnerable people. And the state will be able to fulfil its obligation on savings reporting and monitoring of the effectiveness of implemented measures for energy-poor citizens.
Barriers	The slowness of the Croatian administrative system and decision-makers

Financing renovation measures with 100% grant support	
The responsible entity and leading person	Ministry of Economy and Sustainable Development

	Ministry of Spatial Planning, Construction and state property The Environmental Protection and Energy Efficiency Fund
The target group for the action	Energy poor households and vulnerable citizens
Action design	This measure is not something new in Croatia because there was in 2020 "Public call for energy renovation of family houses for vulnerable groups of citizens at risk of energy poverty" - but call was opened only for citizens in welfare system and excluded other categories of vulnerable group of citizens and citizens at risk of energy poverty. Also the call barely used half of the funds because the criteria were too strict. The proposal for this action/measure is to design calls with better criteria and open calls that is not only intended for citizens in general poverty, but also for citizens in energy poverty. Also Public call from 2020 included only renovation for family houses - it is proposed to design public call for multiapartment buildings and social housing. But with clearly proposed criteria of who are energy-poor households in multi-apartment buildings. Criteria should be identified in proposed action 1 under NECP. Simplification of administrative procedure and application itself
Scheduling	2023-2030
Budget	Call for 100 households each year (900 households in period 2023-2030) – HRK 18 million (2.389.010 €)*

	Program** HRK 150 million (19.957.418 €) from NPOO and HRK 205 million (27.275.139 €) from the state budget
Drivers	The interest of citizens, social institutions and local authorities for this kind of Public calls that finance the renovation of energy-poor households.
Barriers	The Public call could be opened before the adoption of the criteria which could again contribute to the failure of calls like it happened in 2020.

*20 000 € per households; 60 000 households that are social welfare system beneficiaries - total 1.2 billion €

** Program for mitigation of energy poverty, which includes the use of renewable energy sources in residential buildings in areas of special state until 2025 - HRK 150 million (19.957.418 €) from NPOO and HRK 205 million (27.275.139 €) from the state budget are planned for the entire implementation of the Program in the implementation period. The program covers the renovation of 387 residential buildings (but 413 buildings are listed in the table in Program) and 100% of the renovation costs are planned to be financed.

Establishment of one-stop shops (OSS) to support energy renovation for energy poor households	
The responsible entity and leading person	NGOs Energy agencies Local authorities
The target group for the action	General public and energy poor households and vulnerable citizens
Action design	To establish and organise a comprehensive marketplace and one-stop-shops for homeowners and experts and for these to serve as a central point for all crucial information and guidance on how to implement a successful energy renovation for energy poor households.

	As part of the POWERPPOR project, an office structure was set up and can be used to open new offices/info stand or OSS. The link between POWERPOOR Energy poverty mitigation centre and OSS, the existing structure of the center would be upgraded in form of OSS as physical and online entities and the activity would be expanded to include OSS services.
Scheduling	2023
Budget	900 000 € for 3 OSS*
Drivers	Under "Smart financing for smart buildings" initiative Member States are encouraged "to develop dedicated local or regional OSS for project developers, covering the whole customer journey from information, technical assistance, structuring and provision of financial support, to the monitoring of savings. These facilities should lead to more locally-developed project pipelines and strong and trustworthy partnerships with local actors (e.g. SMEs, financial institutions, and energy agencies), the key being to connect the supply of finance with demand for it.
Barriers	NGOs and energy agencies which will establish OSS through the project like POWERPOOR will face the problem of financing the OSS after the end of the project.

* according to the budget proposed for the project

Private rented sector – spreading awareness about renovation and encourage energy renovation to landlords	
The responsible entity and leading person	Ministry of Economy and Sustainable Development

	Ministry of Spatial Planning, Construction and state property The Environmental Protection and Energy Efficiency Fund NGO
The target group for the action	Private rented sector - landlords and tenants
Action design	The private renting sector and private landlords are not specifically targeted in energy-efficient renovation programs. In many countries, this poses a serious problem, and it leads to systemic injustices deepening the gap between the classes based on the socioeconomic statuses. The problem of collecting 51% signatures of co-owners in a multi-apartment building for entering into investments in renovation and other similar investments in RES - activities to create education materials for landlords and managers. POWERPOOR Guidebook can be used as one of the materials for raising awareness among landlords. Education and spreading awareness to overcome split incentives between landlords and tenants and mostly split incentives between apartment owners who live in these apartments and apartment owners who rent out the apartments.
Scheduling	2025
Budget	10 000 €
Drivers	Renovation policies and strategies should go beyond immediate financial impacts and outcomes, acknowledging housing market mechanisms and externalities,

	and focus on improving the living experience of citizens
Barriers	In some cases, private landlords do not see the benefit of additional investments in energy efficiency renovations – since they are not the ones sacrificing their quality of life neither are they the ones paying high energy costs. It could be claimed that they only see the downside in terms of high financial investments and not the upside of providing better living conditions for their tenants. Public policies have yet to find a way to engage private renting sector in the discussion on energy poverty mitigation by providing visible benefits for them. NGOs are mostly implementing different activities through project that are publicly funded, and once particular project ends so does the activities in most cases

Establishment of pre-grants to resolve property-legal relations before obtaining a grant for renovation	
The responsible entity and leading person	Ministry of Spatial Planning, Construction and state property Ministry of Justice
The target group for the action	General public and energy poor households and vulnerable citizens
Project design and documentation	Unregulated market and unresolved property-legal relations contribute to the problem of lack of national data and rather slow renovation pace The proposal is the establishment pre-grants to resolve property-legal relations before obtaining a grant for renovation

Scheduling	2023
Budget	HRK 1.8 million (238.901€)
Drivers	New EU ETS system - from 2027 building sector enters the ETS charging system - if there is unresolved property-legal relations, how emissions will be charged if it is not known who is the owner of the property.
Barriers	Even if grants are given, the process can "get stuck" in the courts, and cases can be dragged through the courts for years - a problem of the Croatian judiciary

Build more skills within the entities who are in contact with people in energy poverty - activities to create education materials	
The responsible entity and leading person	NGO
The target group for the action	Social workers and other stakeholders who are involved in working with vulnerable groups of citizens
Action design	Capacity buildings, workshops and seminars - certified advisers and mentors who can provide their services when public calls for renewal are opened (postponed under action 2) through OSS (postponed under action 3)
Scheduling	2023
Budget	20 000 €
Drivers	Focus on improving the life of citizens
Barriers	NGOs who can carry out education through project activities will face the problem of financing the activities after the end of the project.

Passing urgently laws, ordinances and other regulations and encourage activities to promote community-ownership of energy to citizens	
The responsible entity and leading person	Ministry of Economy and Sustainable Development Croatian Energy Regulatory Agency Local governments NGO
The target group for the action	General public, energy poor households and vulnerable citizens
Action design	Passing urgently by-laws - even though there is a law that defines the energy community, in reality it cannot be established in Croatia yet. Encourage activities to promote community-ownership of energy to citizens - workshops and seminars.
Scheduling	2023
Budget	20 000 €
Drivers	Electricity Market Act (Official Gazette 111/21), transposed from EU legislation directive (EU) 2019/944 on common rules for the internal electricity market (IEMD, 2019/944), and on the law on Renewable Energy Sources and High Efficiency Cogeneration (BO 138/2021), Directive 2018/2001 on the promotion of the use of energy from renewable sources (Renewable Energy Directive, RED II, 2018/2001): It is responsible for establishing common rules for the production, transmission, distribution and storage of energy and the supply of electricity, together with provisions on consumer protection, in order to obtain an integrated, competitive, flexible, fair and transparent electricity market. This law presents a close relationship between renewable energy communities and citizen energy communities. On the other

	hand, it is important to mention that for the concrete implementation of the Law by the aforementioned energy and renewable energy communities, it is necessary to wait for the approval of bylaws that will define the relative details. However, the administration of requesting the implementation of different statutes regarding energy communities is more complex than it seems, nevertheless Croatia is committed to transpose the EU legislation pertaining to the rights & obligations of energy communities.
Barriers	The slowness of the Croatian administrative system and decision-makers

Encourage activities to promote crowdfunding campaigns	
The responsible entity and leading person	NGO
The target group for the action	General public, energy poor households and vulnerable citizens
Action Design	Encourage activities to promote crowdfunding campaign to citizens - workshops and seminars One of good practice of raising awareness of crowdfunding campaign in 2022 was webinar organized by DOOR and ZEZ where the idea of organizing a crowdfunding campaign was presented and POWER FUND platform on which crowdfunding campaign can be promoted. ZEZ also in 2022 organised as part CEES project one crowdfunding campaign to raise money for the purchase of energy boxes for energy-poor citizens.

Scheduling	2023
Budget	20 000 €
Drivers	One of the ways in which citizens can help finance energy renovation measures for energy-poor households
Barriers	NGOs who can carry out education through project activities will face the problem of financing the activities after the end of the project.

Revision of "social bonuses"	
The responsible entity and leading person	Ministry of Economy and Sustainable Development Ministry of Labour, Pension System, Family and Social Policy
The target group for the action	Energy poor households and vulnerable citizens
Action design	Measures to support schemes for electricity or gas, and energy efficiency measures - it should be a short-term measure, not a long-term one, and the available financial resources should be directed to long-term measures
Scheduling	2025
Budget	HRK 160 million per year (21.24 million Euros per year)
Drivers	Channelling a large amount of money used for short-term measure to long-term one. The energy voucher has been active as a measure for almost 10 years and is very attractive to politicians because it is easily visible to the public.
Barriers	

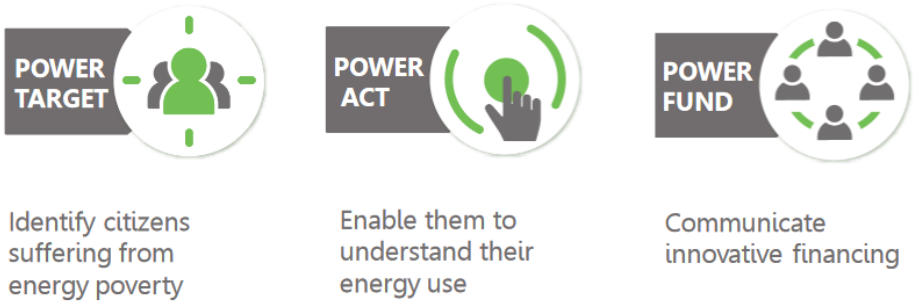
Passing urgently new regulation for better control on legally binding ban on disconnections for energy for poor households and vulnerable consumers	
The responsible entity and leading person	Ministry of Economy and Sustainable Development Ministry of Labour, Pension System, Family and Social Policy Social welfare centers
The target group for the action	Energy poor households and vulnerable citizens
Action design	Legally binding ban on disconnections for energy-poor households and vulnerable consumers should be included in the legislation on a national level. In Croatia ban on the disconnection are proscribed in the law for vulnerable consumers but implementation of these measures is not being closely monitored. With clearly proposed criteria of who are energy-poor households it would be known who could be disconnected from the network and who not. Criteria should be identified in proposed action 1 under NECP.
Scheduling	2024
Budget	n/a
Drivers	Preventing the disconnection of citizens from the network without clear conditions
Barriers	The slowness of the Croatian administrative system and decision-makers

SEACPs to included measures to reduce energy poverty	
The responsible entity and leading person	Ministry of Economy and Sustainable Development

The target group for the action	Local authorities and energy poor households and vulnerable citizens
Action design	Replication of measures from the existing SECAPs, which have already included measures to combat energy poverty, such as: Co-financing of energy renovation of family houses for vulnerable groups of citizens at risk of energy poverty or Small EE measures for vulnerable groups of citizens at risk of energy poverty or Establishment of a center for energy consulting and assistance to the energy poor households.
Scheduling	2023
Budget	/
Drivers	Local municipality should use opportunity during creation or revision of SECAPs to include measures to alleviate energy poverty during the creation or revision of SECAPs. Especially if they do not have enough capacity to work on programs for alleviating energy poverty.
Barriers	SECAP is not a mandatory document.

The POWERPOOR toolkit is incremental to the implementation of the individual actions and should be used actively by whichever stakeholder (e.g. municipality or POWERPOOR partner) has been identified, in the previous steps, as being responsible for implementation.

Figure 12 POWERPOOR Toolkit



Step 5: Monitor & Evaluate

One year after completion of the POWERPOOR project (or any other timeframe decided upon during the stakeholder consultations), the first monitoring & evaluation process should take place to see whether the roadmap's actions, and ultimately its vision, are being met.

Table 18 Croatia Action-Specific Indicators

Indicator	Baseline (2022)	Target (date dependent of action)	Target achieved?
NEW revised NECP	last one from 2019	2023	
No. of opened call for renovation with 100% grant support - each year starting with 2023	0	7 rounds of calls – each year 1 (from 2023-2030)	
No. of established of one-stop shops	2	5 (2023-2030)	
No. of events to raise awareness about renovation and encourage energy renovation for landlords	0	7 - each year 1 (from 2023-2030)	
No. of opened call for resolving property-legal	0	5 - each year 1 (from 2025-2030)	

relations 100% grant support - each year starting with 2025			
No. of events and/or no. of materials for capacity buildings for entities who are in contact with people in energy poverty	2	7 - each year 1 (from 2023-2030)	
New by-laws for energy communities	0	N/A	
No. of events to raise awareness of energy communities	2	14 - each year 2 (from 2023-2030)	
No. of events to raise awareness about crowdfunding campaign	2	7 - each year 1 (from 2023-2030)	
NEW revised “social bonuses”	last from 2022	2025	
NEW regulation for better control from being disconnected from the network	last from 2021	2024	
No. of new SEACPs to included measures to reduce energy poverty	4	7 - each year 1 (from 2023-2030)	

This table tracks the progress of general energy poverty indicators leaning on the categorization provided by EPAH.

Table 19 Croatia General Energy Poverty Indicators

Indicator	Baseline (2022)	Target (by 2030)	Target achieved?
Unable to keep home adequately warm % of population (2021)	6,6%	4%	
Arrears on utility bills % of population r (2021)	15,2%	6,2%	
Total Housing costs in disposable income (2020)	15,8	10%	
Types of energy used for heating homes (Central/ District heating)	5%	Increase 10%	
Types of energy used for heating homes (Electricity)	21%	10%	
Types of energy used for heating homes (Oil)	4%	3%	
Types of energy used for heating homes (Petroleum products)	3%	2%	
Types of energy used for heating homes (Gas)	19%	10%	

Types of energy used for heating homes (wood)	48%	40%	
Types of energy used for heating homes (Heat pump)	n/a (around 0%)	Increase	

Recommendations on how to implement the national roadmap

The above process will have resulted in a national roadmap which has been co-created with a diverse group of stakeholders from the POWERPOOR National Stakeholder Liaison Groups. Following the national policy dialogues and consultations, the following are additional recommendations to specific stakeholders.

For local and regional Governments

Creating a local energy poverty centres or one-stop-shops to provide information and adviceon calls and opportunities energy savings and eenrgy efficiency measures.

Opening of new financial instruments for the renovation of energy-poor households

SECAPs should include measures for energy-poor households

Collecting the data and monitoring the progress of energy poverty mitigation and reporting to national government

Creation of local schemes for afforded living/housing

For National Governments

Creating Program for alleviating energy poverty

Defining the national definition of energy poverty

Creating clear criteria for recognizing energy poor households
Creating measures for alleviating energy poverty
Monitoring the effect of these measures

For Civil Society

Support local and regional governments in establishing one-stop shops

Stable financing for the implementation of awareness-raising activities

Application project on energy poverty covering different regions in Croatia

For The Private Sector

Establishment of one-stop shops

Inclusion of financial institutions in financial mechanisms for the renovation of energy-poor households.

8. National Energy Poverty Mitigation Roadmap of Estonia

Introduction

In the POWERPOOR project, partners are actively assessing causes of energy poverty and suggest short-term and collective energy action solutions to mitigate this problem. A highly diverse network of Energy Supporters and Mentors has been trained and is being engaged to further support energy poor households to implement solutions. The project also sets up Local Energy Poverty Mitigation Offices in engaged municipalities. POWERPOOR strives to trigger high-impact change, not only on the local and regional level, but also on the national and European level. Such a multi-level governance approach will result in long-lasting impact and coordination between local needs and national (e.g., National Energy and Climate Plans) and supra-national enabling frameworks.

The aim of the national roadmaps is then to build on current project activities and to enable the application of the POWERPOOR approach to promote integrated energy poverty mitigation policies across all regions and cities within the pilot countries. This roadmap template is a synthesis exercise based on several outputs of the Work Packages and is to be used by project partners and Energy Supporters & Mentors during the last year of the project and beyond its lifetime (also possibly to be incorporated into future Horizon projects).

Next to the project national partners, stakeholders out of the network of Energy Supporters and Mentors, especially those at the National Liaison Groups, should be invited, to take ownership of the national roadmaps and take the process forward. This work will result in lessons-learned, which, in turn, generate policy recommendations on how the national regulatory / incentive framework should be adapted to mitigate energy poverty in the first place.

The key content defined in the national roadmaps will input the POWERPOOR exploitation plan as well as the POWERPOOR EU Policy Roadmap.

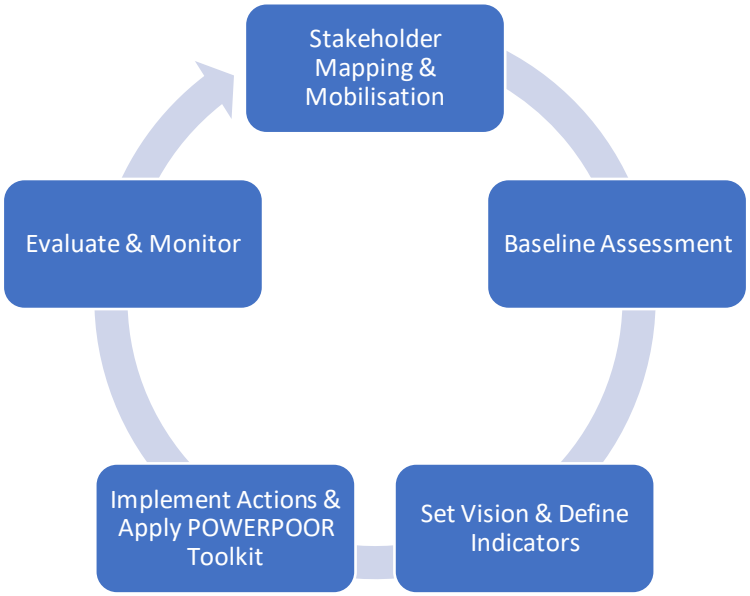
What is the methodology for the national roadmaps?

The development and adoption of the national roadmap is subdivided into two phases, which each encompasses specific steps on an integrated management cycle (adapted from ICLEI Green Climate Cities Programme). The cycle has been chosen as a basis for the roadmap since it promotes a holistic approach to policy making.

Phase 1 takes place until the end of the POWERPOOR project and includes steps which shall be carried out by partners and Energy Supporters and Mentors until then. Phase 2 takes place within one year after the project, or on any other timeline decided by the

partners and stakeholders. Once the cycle has been completed a first time, the process can be repeated (and could potentially serve as a basis for future projects).

Figure 13 Roadmap Methodology



Adapted from ICLEI Green Climate Cities Handbook 2016

National Roadmap Development

Phase 1

The following three steps correspond largely to the activities carried out within the POWERPOOR project and rely strongly on the findings of Deliverable 4.2 "Baseline Assessment Report". They will form the basis for the national roadmaps and for the subsequent steps of Phase 2.

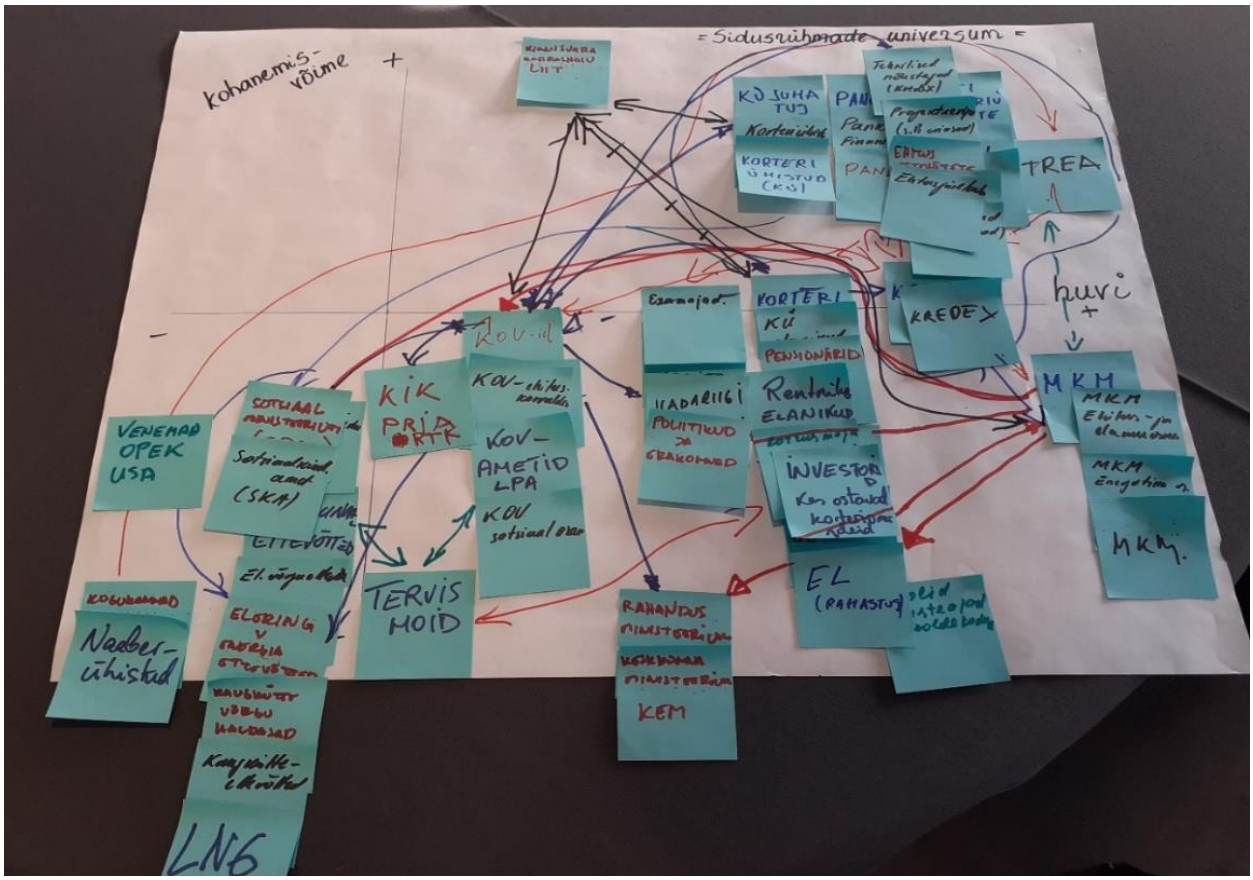
Step 1: Stakeholder Mapping

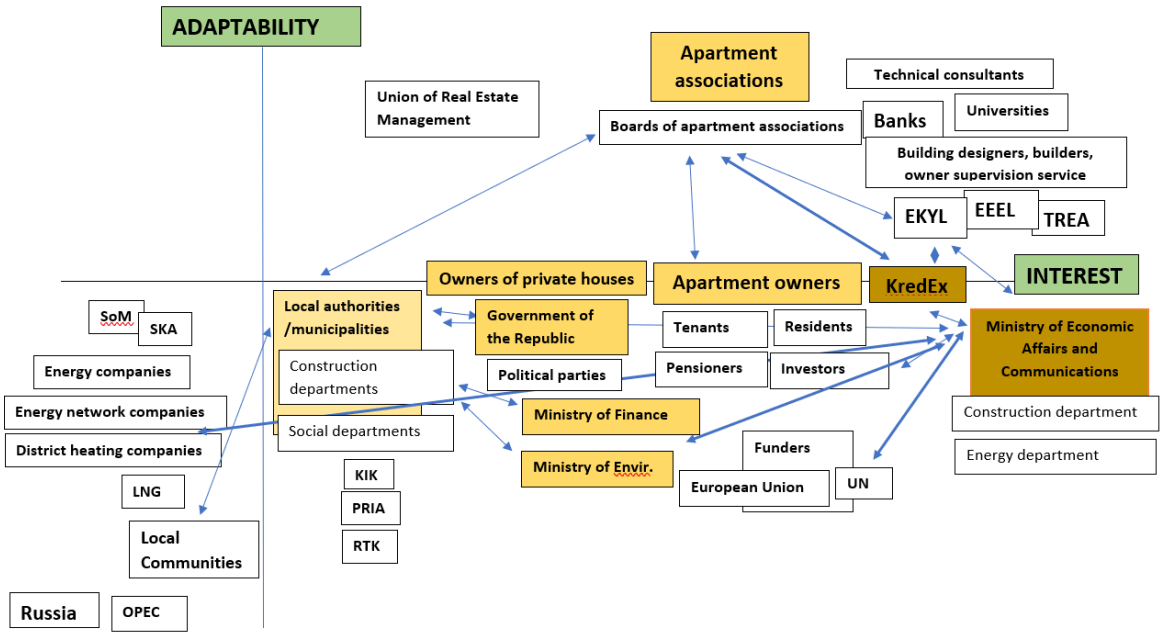
As part of D4.1, project partners have carried out an initial assessment of stakeholders who are part of the National Liaison Groups, have created an overview of the expectations the different stakeholders have towards the project as well as their influence and level of expertise. As part of the roadmapping process, it becomes important to identify the relative importance of particular stakeholder groups vis-a-vis energy poverty mitigation and to identify how flexible stakeholders are to adapt their everyday (business) practices and what kind of networks exist between them. The stakeholder universe methodology, as presented in Module 4 lends itself well for this.

This exercise was done together during the stakeholder consultations and is aimed at understanding stakeholder relations, to identify possible disconnection, flows of knowledge/resources and power. “Tackling energy poverty” is the main star, stakeholders with the highest interest (to mitigate energy poverty), are closer to it. Flexible stakeholders are placed above the x-axis, non-flexible stakeholders beneath. Stakeholders placed closer to each other have a closer working relationship. Once this is mapped out, connect stakeholder to depict fluxes of resources, money or others. Spot potential clusters of interest and identity as well as critical stakeholders, which link clusters and act as “gatekeepers” or knowledge brokers. Then the network was analysed.

During the workshop, together with the participants, add new stakeholders, or consider where to place already identified ones on the stakeholder universe canvas.

Figure 14 Estonia Stakeholder Universe





Description of the stakeholder universe:

The analysis of the stakeholders tackling energy poverty highlighted 3 most important groups of stakeholders:

- **State authorities**, where the **Ministry of Economic Affairs and Communications** was marked as most interested, most responsible, and most influential in this field. The ministry works closely with other state institutions (fund KredEx, other ministries, etc.), municipalities, universities, civil society organisations and have consultation competence with private companies, banks, and funding bodies in EU and beyond. It means the ministry have the means to engage and mobilise all the other stakeholders for mitigating energy poverty.
- **Local municipalities,** which has the obligation of creating sustainable living environment. Although the municipalities have not had much role of an initiator of energy efficiency in Estonia, they still have much potential to be a facilitator for energy efficiency renovation and establishment of energy communities in cooperation with local apartment associations and
- **Apartment associations** - non-profit organisations established for collective management of the apartment buildings, which are uniting home-owners and making decisions about mitigating energy poverty in apartment buildings. As around 70% of population are members of apartment associations in Estonia, the apartment associations, more than 23,000 across the country, were considered as **the central stakeholder group and target group when it comes to planning and implementing new measures for mitigating energy poverty**

through renovation of building stock or implementing solutions of renewable energy for self-consumption. As Estonia has still a quite few energy communities, the apartment associations, which are already working with collective investments for renovation and renewable energy solutions of buildings, can be seen as a first step towards energy communities as well.

During the stakeholder mapping task, the participants of the workshop emphasized the importance of outside factors and players having an impact on the mitigation of energy poverty on a national level. Therefore, outside and international stakeholders were added to the stakeholder universe to give a wider picture.

As a result of the national roadmap development, a joint statement to commit to the goals and activities mentioned in the roadmap is planned to be made by the stakeholders that were involved in the roadmap development process.

Once the most important stakeholders have been identified as a core group, they need to be mobilized and their commitment to this national roadmap needs to be secured. The way the commitment is secured is up to the project partners. One way to do this could be to already include mention of the roadmap development process as part of the MoUs which are signed as part of the stakeholder liason groups. Alternatively, consider a simple joint statement communicated through project partner channels following the stakeholder consultation for this national roadmap.

Step 2: Baseline Assessment

The state of play / baseline for what concerns energy poverty in the overall country has already been analysed at the beginning of the project and captured in D4.2. As part of the roadmap process, it is recommended to revaluate the baseline parameters (subject to available capacities of course) to see if any changes have occurred since the last baseline assessment. The baseline assessment should then be presented during the meeting with the stakeholders of the National Liaison Group. Key policy areas to be, at least, presented as part of the baseline assessment are the following. Consider how energy poverty mitigation is addressed in the following areas and fill out the table below.

This overview in the Table below was drawn up by EKYL according to the best current knowledge, with provided information based on public data. Due to rapid changes in the energy sector, the overview or the information contained therein are not final and may not correspond to future situations or the joint statement that is planned to be made by the stakeholders that were involved in the roadmap development process.

Table 20 Estonia Baseline Assessment Revision

National Energy and Climate Plans (NECPs)	In the final NECP (https://energy.ec.europa.eu/system/files/2019-03/ec_courtesy_translation_ee_necp_0.pdf Estonia reports the number of households affected, recognising the relationship between energy poverty and energy efficiency in buildings. The approach to address energy poverty issues has not been further developed. The NECP only includes a reference to ongoing preparatory work to better define objectives and corresponding policies and measures. The NECP brings out that, according to the statistics of the European Energy Poverty Observatory, Estonia does not stand out as very problematic. For example, 2.9% of households had a problem with heating and 6.3% of households have arrears in paying energy. The share of Estonian families' energy payments from income is very close to the EU average (16.3%) at 16.2%. The only issue is cooling, where keeping the living space cool is more problematic than in many other countries (Estonia 23.3% compared to the EU average of 19.2%). In summary, it can be said that in terms of energy purchasing power, Estonia's situation is slightly better than the EU average. *Comment: However, energy poverty was described as a serious issue in 2021. Estonia will update the NECP in 2023.* The NECP declares, that by 2030, 80% of the heat produced in Estonia will be produced on the basis of renewable energy sources. *In October 2022, Estonia's parliament adopted a new renewable electricity target of 100 per cent by 2030, and the additional energy should come largely from wind and solar power plants. The amendment to the law obliges both the current and future governments to quickly eliminate the barriers to the development of renewable energy. Creating additional grid connection opportunities, establishing a*

	wind energy benefit scheme for local governments and residents, and speeding up the planning process are examples of positive steps that have already been taken or are currently being prepared. (Source: https://bankwatch.org/blog/100-per-cent-renewable-electricity-is-a-realistic-and-necessary-target-for-estonia-and-europe)
Social care	Welfare Development Plan 2016-2023 does not handle the energy poverty as an independent issue. It focuses on poverty reduction and pursues reduction of the absolute poverty rate to 5.8% and reduction of the relative poverty rate to 15% by 2023. Household subsistence is observed completely on the national as well as local government level.
The building sector - renovation efforts	Estonian long-term strategy for building renovation (https://www.ekyl.ee/wp-content/uploads/Long-term-strategy-for-building-renovation-in-Estonia.pdf) brings out that energy poverty is not currently a widespread problem in Estonia. According to the European Energy Poverty Observatory data, 2.9% of households reported problems with heating their homes and 6.3% of households had energy bill debts. The strategy states (p. 86) that when planning full renovation of existing buildings, it must be remembered that some households are not capable of carrying out renovation. Renovation of a building requires the owner to make a financial contribution even if there are support measures available and households with lower incomes are not able to provide that. Vulnerable households need additional support for participating in energy saving measures. The main goal of this long-term renovation strategy is the full renovation, by 2050, of buildings erected before 2000. The total floor area of the buildings needing renovation is 54 million square metres. According to the strategy, the percentage of this total area to be renovated by 2030 is 22%, by 2040, 64% and by 2050, 100%.

	Broader use of local renewable energy along with renovation of buildings is foreseen. The best technical solution for densely populated areas is the installation of solar panels for producing electricity. The strategy also foresees (p.69) that the electricity consumption of buildings previously without ventilation systems that are fitted with mechanical heat recovery ventilation systems will increase as a result of the renovation. The CO2 emissions of private houses where stove heating is replaced with a heat pump will also increase as a result of the renovation, because previously emission-free woodfuel is replaced by specific emission-intensive electricity. The increase in electricity use can be set off by installing solar panels. The Estonian regional economy scenarios point out the vulnerable regions of the country and emphasise that in addition to giving an advantage to regions outside the capital in support measures, extra measures, such as state guarantees for home loans and renovation loans outside larger cities and greater inclusion of the local government level in measures supporting renovation of buildings, should be taken.
Energy policy/Social Care Policy	The "Energy Sector Organisation Act" (https://www.riigiteataja.ee/en/eli/ee/Riigikogu/act/528102022001/consolide) uses definition from the Social Welfare Act: person suffering from energy poverty' means a person living alone, or a family who has, at least once during the last six months, received a subsistence benefit and whose income per family member in the last month does not exceed the minimum wage. The Act states, that the long-term renovation strategy (see the previous point) must include an overview of the support measures that have been elaborated to alleviate energy poverty. Special rules must be applied concerning persons suffering from energy poverty and vulnerable energy consumers or concerning

	providers of services intended for such persons or consumers. *Comment: The Act doesn't specify the possible special rules but just indicates that there is a possibility to apply special rules in the implementation process of the law.* The Act declares setting up a support framework for renewables self-consumption, that will address: 1) access of final consumers and end users, including those experiencing energy poverty as well as those that are part of a group that is at risk of energy poverty, to renewables self-consumption; 2) unjustified barriers to the financing of projects in the market and measures to facilitate access to finance; 3) other unjustified regulatory barriers to renewables self-consumption, including for tenants; 4) incentives to owners of buildings to create opportunities for renewables self-consumption, including for tenants; 5) the granting, to renewables self-consumers, with respect to self-generated renewable electricity that they feed into the grid, of access to relevant non-discriminatory support schemes as well as to all electricity market segments; 6) the obligation of renewables self-consumers, when feeding electricity into the grid, to contribute in an adequate and balanced way to covering the overall costs of the system.
Policy to promote community-ownership of energy	Energy Sector Organisation Act gives a definition for the "renewable energy community" but no clear target numbers are set in national strategies. 'Renewable energy community' means a legal person controlled by shareholders or members who are a natural person, small or medium-sized undertaking or municipality, whose residence or seat is in the vicinity of the renewable energy projects that are owned or developed by such a legal person and whose primary purpose, instead of

	financial profits, is to provide environmental, economic or social community benefits for its shareholders or members or for the local areas where it operates. The definition doesn't mention vulnerable consumers but the Act still states under another paragraph that 'vulnerable energy consumers' means persons living alone or families whose monthly income per family member during the last six months does not exceed the minimum wage. The long-term strategy for building renovation promotes broader use of local renewable energy along with renovation of buildings. The best technical solution for densely populated areas is the installation of solar panels for producing electricity.
Policy to promote (collective) finance / crowdfunding	The collective financing is promoted through grants for solar panels of apartment building and apartment building renovation loans. (https://kredex.ee/en/services/ku-ja-kov/Apartment-building-renovation-loan) The apartment building renovation loan is directed towards apartment associations that have received a negative response to their renovation loan application from a bank or an offer with unreasonable terms. With the help of the loan it is possible to finance renovation works and to combine the loan with reconstruction grant offered by KredEx. Works that can be financed by the loan are all co-ownership-related renovation works that ensure the structural stability of the apartment building, increase the energy efficiency of the residential building or improve the living conditions of the apartment building's residents. Only apartment associations can be recipients of the loan (It's not possible to apply for the loan as a private person or energy community). The minimum amount is EUR 15,000, and the maximum is EUR 3

	million per apartment association, including if it manages several apartment buildings. Self-financing starting from 5%. The security is the apartment association's claims against its members for the payment of management costs. Grant for solar panels of apartment building supports the capacity of apartment owners to invest in activities that promote energy efficiency in buildings and local renewable energy. If the grant can be used to purchase the energy production and storage installation. The power of the installed energy production installation should not exceed 200 kW. Only apartment associations can be recipients of the grant. (It's not possible to apply for thegrant as a private person or energy community). The energy production installation should be installed on the roof or façade of the apartment building. The maximum grant per applicant is EUR 150,000, covering up to 30-40% of the project costs. If state funding (reconstruction grant) is used for full-scale renovation, apartment association is obliged to use a certified professional called "technical consultant" in the renovation process. Using the services of a technical consultant is not required for partial reconstruction. The technical consultant advises the beneficiary on the budgeting of design and construction works, procurement of design and construction works, preparation of time schedules and carrying out other necessary processes. The main task of the technical consultant is to advise the apartment association on technical issues, in particular before the start of the renovation works, but also in the later stages of the renovation process.
The energy market (e.g. social tariffs / tax incentives)	Several actions have been taken to minimise the impact of price increases on energy poverty. On October 2021, 50% of the electricity network service fee was deducted from the electricity bill of all private and business consumers. Households whose

	income is below the median received 80% refund for the price increase of electricity, gas, and district heating. On January 2022, 100% of gas network fees were reimbursed to all private and business consumers from January to March 2022 and a price cap was set on electricity and gas for private consumers. Any excess was deducted from the household's monthly bill from January 2022 to March 2022.
Consumer protection	See the previous point
SECAPs	SECAP of Tallinn points out that there is a need to develop local energy production, thanks to which residents of the city can also participate directly through energy cooperatives. Energy cooperatives allow people to produce and consume green energy themselves flexibly and by spreading risks, thereby offering an alternative to individual small-scale production and dependence on large producers. By the example of SECAP of the city of Tartu, the following measures should be taken on the local government level to mitigate energy poverty: • support the establishment and promotion of renewable energy communities (energy associations); • provide technical, legal and economic counselling; • raise awareness and educate the residents on the topics of energy efficiency and energy poverty; • establish a working group on renovation capacity; • support the preparation of design documentations for renovating apartment buildings.

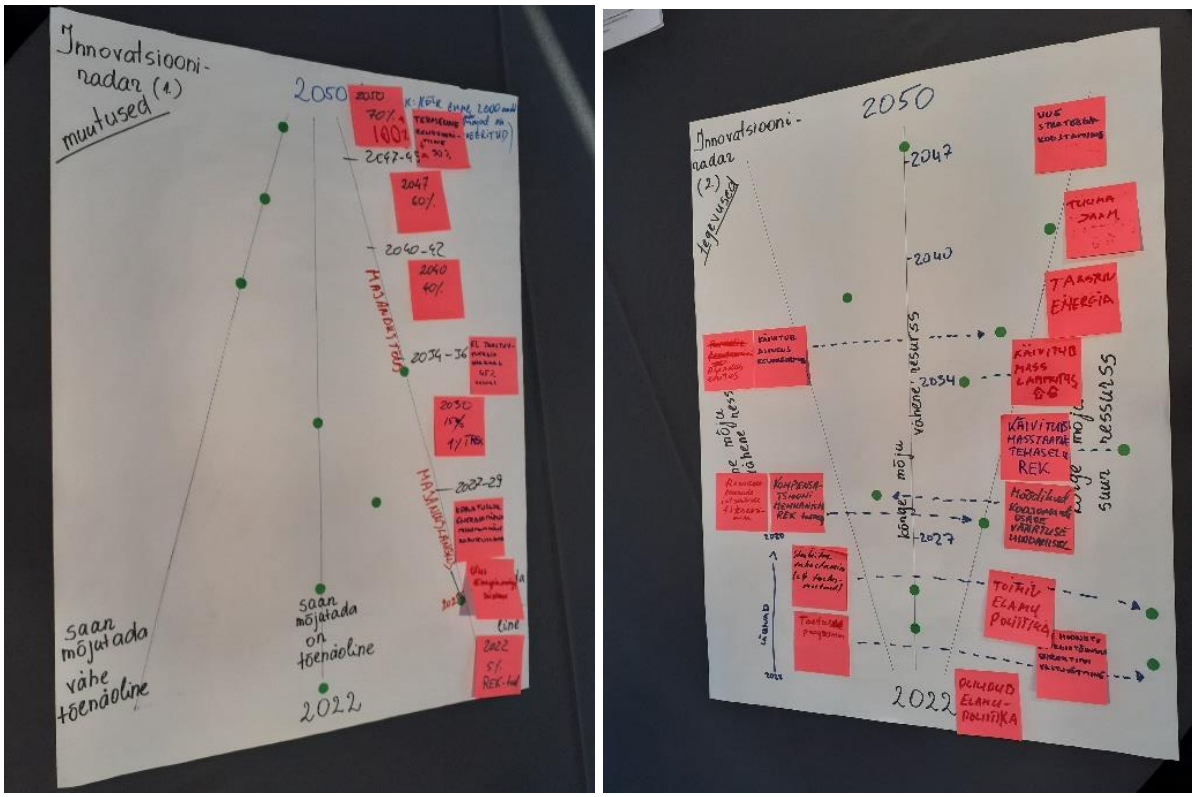
Step 3: Set Vision, envision Actions and define Indicators

Now that the stakeholders have been gathered, committed and the national regulatory context reassessed, it is time to foster a common understanding on what alleviating energy poverty actually means for the different stakeholder groups. During the

stakeholder consultation, a concrete vision for energy poverty mitigation should be created. The future radar methodology lends itself well for this purpose.

By applying this tool, we planned policy actions equipped with a global overview of the milestones to achieve, coupled with their feasibility and the influence you can put on them to happen. The second "cone" will present a detailed plan of actions to implement to achieve the changes envisaged in the first "cone". Be as specific as possible when it comes to assigning dates.

Figure 15 Estonia Future Radar



The discussions emphasized the importance of long-term solutions to energy poverty. Providing financial support for vulnerable households can't be a sustainable solution. Instead, there is a need to focus on the renovation of the housing stock so that all homes are energy efficient and have low energy costs for all consumers. Therefore, the change foreseen in the roadmap development was the renovation of all housing stock built before 2000 by 2050.

Table 21 Estonia Actions

Policy Sector	Actions to be implemented	By when?	By whom?

Energy communities	New legislation and supportive legal framework developed for the creation and management of energy communities	2023	Ministry of Economic Affairs and Communications, Ministry of Justice
Buildings	New program of financial support measures developed for apartment associations and owners of small residences, including new grants for renovation and renewable energy solutions	2023	Ministry of Economic Affairs and Communications
Housing	New housing policy – currently the energy poverty is targeted through energy policy or social policy, leaving out the aspects of housing issues that brings these two sides together. This cap should be filled with new housing policy.	2025	Ministry of Economic Affairs and Communications, Ministry of Social Affairs, municipalities
Buildings	New system of energy certificates in force	2025	Ministry of Economic Affairs and Communications
Buildings	New training programs for apartment associations and homeowners on renovation, energy efficiency and energy communities	2025	EKYL; Ministry of Economic Affairs and Communications

For each of the co-identified actions, indicators should be defined to enable monitoring progress at regular intervals.

Table 22 Estonia Action-Specific Indicators

Indicator	Baseline (2022)	Target (date dependent on action.
New/updated legislative acts	o	1-3 (2023)
New programme of financial support measures	0	1 (2023)
New housing policy	0	1 (2025)
New system of energy certificates	0	1 (2025)
All residential buildings built before 2000 are renovated at least to energy label C	10%	100% (2050)
Training programmes	1	4 (2025)

Phase 2

The previous first three steps of the management cycle laid out the basis for the national roadmaps. The content of those steps will have been discussed during various stakeholder consultations. The results will inform the next two steps which take place within one year following the closure of POWERPOOR (or any other timeline decided upon during stakeholder consultations).

Step 4: Implement Actions and apply POWERPOOR Toolkit

This is where the concrete actions, defined previously, are implemented according to the established timeline.

Table 23 Estonia Action Elements

Action : New legislation and supportive legal framework developed for the creation and management of energy commuities	
The responsible entity and leading person	**The Ministry of Economic Affairs and Communications, The Ministry of Justice**
The target group for the action	**Apartment associations, homeowners, municipalities**
Project design and documentation	**Steps of legislative process**
Scheduling	Ready by 2023
Budget	Not enough information
Drivers	The need for more clear legal acts in this field, obligations from EU directives and pressure from the stakeholders
Barriers	Organisational aspects Low priority for legislative bodies

Action : New programme of financial support measures for apartment associations and owners of small residences	
The responsible entity and leading person	**The Ministry of Economic Affairs and Communications**
The target group for the action	**Apartment associations, homeowners, municipalities**
Project design and documentation	1. **Preparations for the new financing tools (2023)** 2. The first open call to participants (2023)
Scheduling	50-100 buildings supported/year
Budget	Not enough information
Drivers	High energy costs that motivate homeowners to act

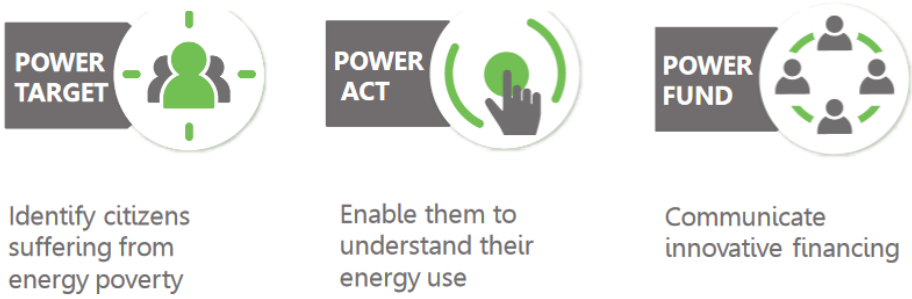
	Available demo cases and best practice projects that showcase the achievable results with previous financing measures
Barriers	Organisational aspects Lack of funds for sustainable financing Low awareness of participants to attend the calls
Action : New housing policy	
The responsible entity and leading person	**The Ministry of Economic Affairs and Communications, The Ministry of Social Affairs, municipalities**
The target group for the action	**Apartment associations, homeowners, social housing providers**
Project design and documentation	**Steps of legislative process**
Scheduling	2025
Budget	Not enough information
Drivers	The actual need from everyday life
Barriers	Organisational aspects Financing
Action : New system of energy certificates	
The responsible entity and leading person	**The Ministry of Economic Affairs and Communications**
The target group for the action	**Apartment associations, homeowners, municipalities**
Project design and documentation	**Not enough information available for detailed project design**
Scheduling	2025
Budget	Not enough information
Drivers	Obligations from EU directives

Barriers	Organisational aspects Financing Low awareness
Action : Renovation of all housing stock built before year 2000 to be energy efficient	
The responsible entity and leading person	**The Ministry of Economic Affairs and Communications**
The target group for the action	**Apartment associations, homeowners, municipalities**
Project design and documentation	1. **Preparations for the renovation programme (2023)** 2. Providing new financing measures (2023-2025) 3. New digital tools for renovation (2025-2030) 4. Start of the renowation vawe (2030) 5. Renovation and monitoring (2023-2025)
Scheduling	The percentage of total area to be renovated by 2030 is 22%, by 2040, 64% and by 2050, 100%.
Budget	According to the Long-term strategy for building renovation the total financing need by 2050 will be €8.4 billion.
Drivers	High energy costs that motivate homeowners to act Available demo cases and best practice projects that showcase the achievable results
Barriers	Organisational aspects Financing Low awareness
Action : New training programmes for apartment associations and homeowners	

The responsible entity and leading person	**The Ministry of Economic Affairs and Communications, EKYL**
The target group for the action	**Apartment associations, homeowners, municipalities**
Project design and documentation	1. Preparation of training programs, development of the curriculum (2023) 2. Pilot trainings (2024) 3. Beginning of the training period (2025)
Scheduling	The percentage of total area to be renovated by 2030 is 22%, by 2040, 64% and by 2050, 100%.
Budget	Not enough information
Drivers	High energy costs that motivate homeowners to act Need for new knowledge and skills
Barriers	Organisational aspects Financing Low awareness

The POWERPOOR toolkit is incremental to the implementation of the individual actions and should be used actively by whichever stakeholder (e.g. municipality or POWERPOOR partner) has been identified, in the previous steps, as being responsible for implementation.

Figure 16 POWERPOOR Toolkit



Step 5: Monitor & Evaluate

One year after completion of the POWERPOOR project (or any other timeframe decided upon during the stakeholder consultations), the first monitoring & evaluation process should take place to see whether the roadmap's actions, and ultimately its vision, are being met.

Table 24 Estonia Action-Specific Indicators

Indicator	**Baseline (2022)**	**Target (date dependent on action.**	**Target Achieved?**
New/updated legislative acts	o	1-3 (2023)	
New programme of financial support measures	0	1 (2023)	
New housing policy	0	1 (2025)	
New system of energy certificates	0	1 (2025)	
All residential buildings built before 2000 are renovated at least to energy label C	10%	100% (2050)	
Training programmes	1	4 (2025)	

This table tracks the progress of general energy poverty indicators leaning on the categorization provided by EPAH.

Table 25 Estonia General Energy Poverty Indicators

Indicator	Baseline (2022)	Target and Date (Vision)	Target achieved?
Inability to keep home adequately warm	2%	0% (2030)	YES/NO (further details)
Arrears in paying energy bill	3.9%	1% (2030)	
High share of energy expenditure in income	16.8%	10% (2030)	
Dwellings with presence of leak, damp or rot	10%	0% (2050)	

Recommendations on how to implement the national roadmap

The above process will have resulted in a national roadmap which has been co-created with a diverse group of stakeholders from the POWERPOOR National Stakeholder Liaison Groups. Following the national policy dialogues and consultations, partners will reflect on the roadmap drafting process and can suggest additional recommendations to specific stakeholder groups on HOW the above-listed actions can be implemented. Recommendations should be aimed at the following groups and be included below:

For Municipalities

Provide technical, legal and economic counselling to apartment associations, homeowners and persons who are interested in establishing or joining energy communities;

Raise awareness and educate the residents on the topics of energy efficiency and energy poverty

Provide financial support measures for energy efficiency solutions

Facilitate district level renovation to support large-scale energy efficency renovation with lower costs for homeowners through joint procurement process

Participate in energy communities together with other local stakeholders

For National Governments

Support the establishment and promotion of renewable energy communities;

Raise awareness and educate the homeowners on the topics of energy efficiency and energy poverty so that they will be able to make independent decisions about the renovation of buildings or joining an energy community.

Support the preparation of standard model project documentations for renovation of apartment buildings.

Secure the long-term sustainability of financing measures, like grants and loans for apartment associations and homeowners, for renovation and the implementation of renewable energy solutions.

Develop sustainable housing policy which would bring together the different aspects from energy policy and social policy concerning mitigation of energy poverty

Support new grid networks for renewable energy production in energy communities

For Civil Society

Raise awareness and educate the residents on the topics of energy efficiency and energy poverty

Engage residents in community activities and round-tables to discuss energy efficiency and energy saving issues

Establish energy communities

For The Private Sector

Contribute to the development and implementation of the new technical and digital solutions for renovation like renovation of buildings with pre-fabricated panels, or using the digital twin of Estonian housing stock in the designing process.

9. National Energy Poverty Mitigation Roadmap of Greece

Introduction

In the POWERPOOR project, partners are actively assessing the causes of energy poverty and suggest short-term and collective energy action solutions to mitigate this problem. A highly diverse network of Energy Supporters and Mentors has been trained and is being engaged to further support energy-poor households to implement solutions. The project also sets up Energy Poverty Mitigation Offices in engaged municipalities. POWERPOOR strives to trigger high-impact change, not only on the local and regional levels but also on the national and European levels. Such a multi-level governance approach will result in long-lasting impact and coordination between local needs and national (e.g., National Energy and Climate Plans) and supra-national enabling frameworks.

The aim of the national roadmaps is then to build on current project activities and to enable the application of the POWERPOOR approach to promote integrated energy poverty mitigation policies across all regions and cities within the pilot countries. This roadmap template is a synthesis exercise based on several outputs of the Work Packages and is to be used by project partners and Energy Supporters & Mentors during the last year of the project and beyond its lifetime (also possibly to be incorporated into future Horizon projects).

Next to the project national partners, stakeholders out of the network of Energy Supporters and Mentors, especially those at the National Liaison Groups, should be invited, to take ownership of the national roadmaps and take the process forward. This work will result in lessons-learned, which, in turn, generate policy recommendations on how the national regulatory / incentive framework should be adapted to mitigate energy poverty in the first place.

The key content defined in the national roadmaps will input the POWERPOOR exploitation plan as well as the POWERPOOR EU Policy Roadmap.

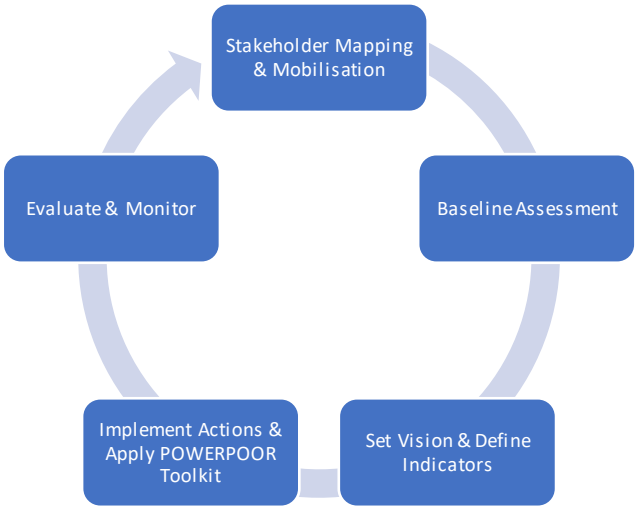
What is the methodology for the national roadmaps?

The development and adoption of the national roadmap is subdivided into two phases, which each encompasses specific steps on an integrated management cycle (adapted from ICLEI Green Climate Cities Programme). The cycle has been chosen as a basis for the roadmap since it promotes a comprehensive approach to policymaking.

Phase 1 takes place until the end of the POWERPOOR project and includes steps that shall be carried out by partners Energy Supporters and Mentors until then. Phase 2 takes place within one year after the project, or on any other timeline decided by the partners

and stakeholders. Once the cycle has been completed the first time, the process can be repeated (and could potentially serve as a basis for future projects).

Figure 17 Roadmap Methodology



National Roadmap Development

Phase 1

The following three steps correspond to the activities carried out within the POWERPOOR project and rely strongly on the findings of Deliverable 4.2 "Baseline Assessment Report." They will form the basis for the national roadmaps and for the subsequent steps of Phase 2.

Step 1: Stakeholder Mapping, Commitment & Mobilisation

As part of D4.1, project partners have carried out an initial assessment of stakeholders who are also part of the National Liaison Groups, have created an overview of the expectations the different stakeholders have towards the project as well as their influence and level of expertise. As part of the road mapping process, it becomes important to identify the relative importance of particular stakeholder groups vis-a-vis energy poverty mitigation and to identify how flexible stakeholders are to adapt their everyday (business) practices and what kind of networks exist between them. The stakeholder universe methodology, as presented in Module 4 lends itself well for this.

Below, the POWERPOOR stakeholders' universe is depicted, having energy poverty mitigation at the core of the system while the horizontal axis (x) accounts for the interest or affinity for the project, meaning that the closer to energy poverty mitigation a stakeholder is depicted, the higher their affinity is. The vertical axis (y) accounts for the adaptability of the stakeholders regarding energy poverty mitigation and represents the likelihood of a stakeholder to change their mind regarding the phenomenon throughout the process. The bigger the node is displayed, the stronger the impact and influence of the stakeholder group to energy poverty phenomenon and, of course, to the objectives of the project.

Following the analysis of the target groups/stakeholders, the following conclusions have been noted:

Local Authorities are considered to have significant interest in the energy poverty domain and its mitigation and consequently in the project but still low adaptability due to the recent realisation that the phenomenon directly affects them.

Regional Authorities are considered to have low to medium interest and adaptability to energy poverty as the phenomenon is not yet high on their agendas.

National Authorities have relatively high interest and adaptability, the phenomenon is presented in various public documents and following the EU directives, strategies, and guidelines, they have the obligation to adopt, adapt and integrate actions into the national framework.

SMEs have a low interest in energy poverty though they rapidly adopt market trends, aiming to cover market needs with their products or services.

ESCOs have high adaptability to the demands of society at the time to provide their services. Their interest in the energy poverty phenomenon though is considered low. The energy poverty domain is of high interest to both **Technical Universities** and **Academia** as is a potential field in their curriculums and study topics, but also academic bodies are quick to adapt to the new realities of society, and energy poverty is one of the subjects that universities have been working on in recent years.

Civil Society organisations have increased interest in energy poverty. At the same time, the organisations are also adaptable as it is much quicker to recognise the needs of citizens and the market.

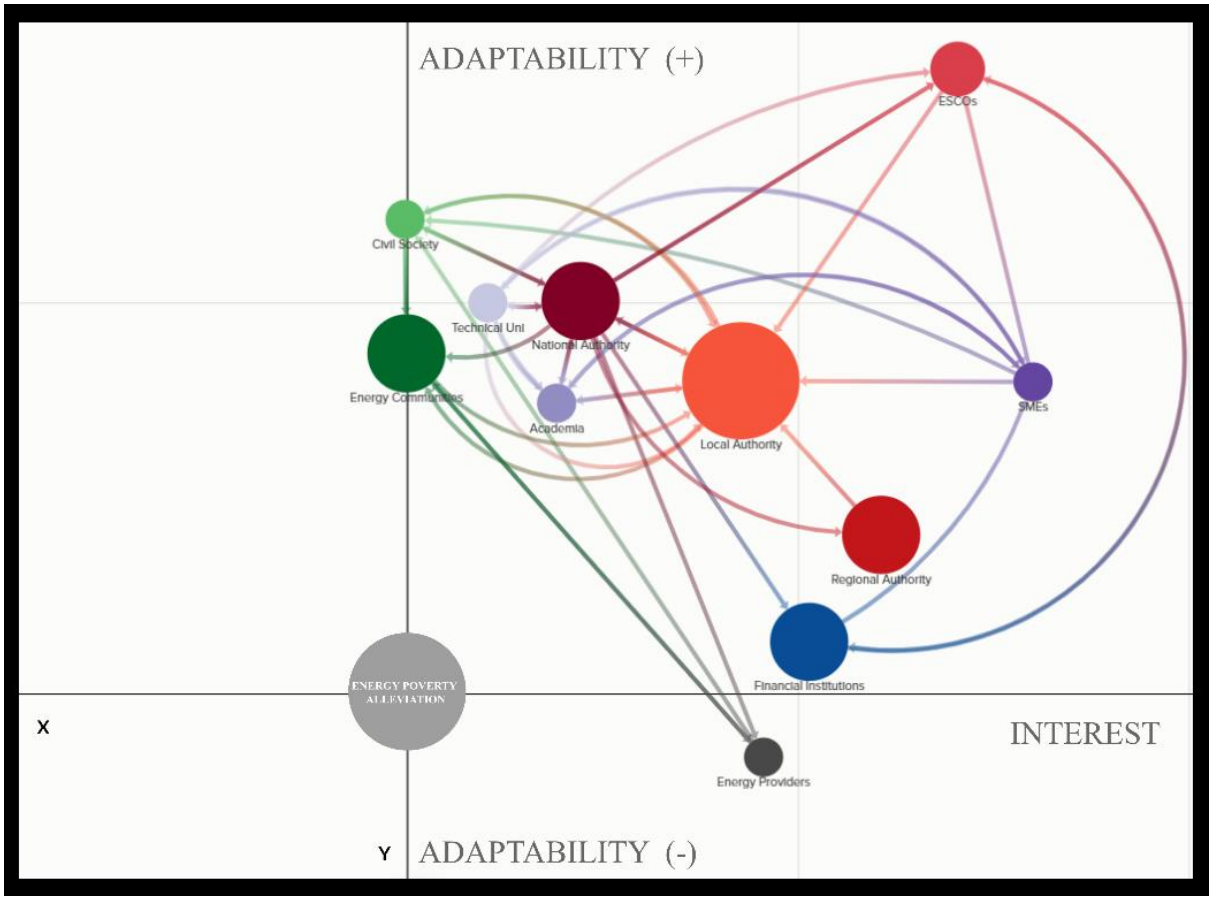
Energy Communities are important stakeholders as are fundamentally linked to energy poverty mitigation. Hence energy communities are depicted right on the vertical axis, indicating their high interest in the mitigation of the phenomenon but also higher from the horizontal axis reflecting this way their medium to high adaptability.

Financial Institutions have medium to low interest and adaptability to energy poverty as they are not directly connected to the phenomenon's mitigation.

Energy providers have a medium interest in the energy poverty domain but relatively low adaptability.

There are many links between the different stakeholder groups depicting relationships between stakeholders, as one group feeds the other with information, resources, etc.
National authorities feed the ESCOs regarding new policies and measures, then the ESCOs are reshaping their services and feed local authorities. National authorities also feed into regional authorities and the latter feed into local authorities. The local authorities feed back into the national, indicating a direct connection between these bodies. Technical Universities and Academia feed the national authorities and contribute with their feedback to the shaping of new policies. The flow of resources, impact, and knowledge is two-way while also there is a two-way connection and collaboration between Academia and Technical Universities. ESCOs receive information and resources from Technical Universities, national authorities, and SMEs and they feed into local authorities. Local authorities are directly connected with almost all stakeholder groups, receiving various resources, and feeding back into civil society, national authorities, energy communities, and Academia. SMEs have a two-way connection with Academia and Technical Universities while SMEs are feeding into ESCOs, civil society and local authorities. There is a two-way exchange of resources between local authorities and energy communities while energy communities are also affected and connected with the stakeholder groups of civil society, national authorities, and energy providers.
Energy providers are receiving information in the form of measures and policies from the national authorities and are feeding back into civil society while there is a two-way linkage with the energy communities. Financial institutions are feeding into ESCOs, and SMEs and they are receiving information and resources from national Authorities and ESCOs.
The stakeholder universe exercise was initially prepared by NTUA and INZEB. The outputs were extensively discussed with the members of the Stakeholder Liaison Group, including the participation of the third partner from Greece SUST, during the third meeting that was held in Greece on November 18th, 2022.

Figure 18 Greece Stakeholder Universe



Step 2: Baseline Assessment

The state of play/baseline for what concerns energy poverty Greece has already been analysed at the beginning of the project and captured in D4.2. As part of the roadmap process, the baseline parameters were re-assessed and re-evaluated to capture changes that have occurred since the last baseline assessment. The baseline assessment has been presented during the 3rd Stakeholder Liaison Group meeting and discussed with the members to agree on the final content.

Table 26 Greece Baseline Assessment Revision

National Energy and Climate Plan (NECP)	The goal of addressing energy poverty is stated in the Greek **NECP** as part of the clean energy and energy efficiency axes of action to be promoted. More specifically, according to NECP the national target for energy poverty is the reduction of at least 50% of the relevant energy poverty indicators by 2025 and 75% by 2030, compared to 2016 levels. In addition, the national goals should aim to be well below of the EU average. The NECP was published in December 2019.

National Energy Poverty Action Plan (NEPAP)	The **NEPAP** includes both the definition of households affected by energy poverty through specific quantitative criteria, as well as the development of a specialised process for monitoring and evaluating the process of mitigation until the year 2030. It foresees 16 actions under three dimensions: a) customers' protection, b) increase of energy efficiency and renewables, c) information and education. The NEPAP builds on the energy poverty reduction targets set at the NECP. NEPAP (v0.6) was published in August 2021
The building sector - renovation efforts	1. The Long-Term Renovation Strategy (LTRS) accompanies NECP and places special emphasis on the energy retrofitting of the Greek building stock (residential and commercial buildings, public sector buildings), facilitating the cost-effective conversion of existing buildings into buildings with almost zero energy consumption. The third edition of the National LTRS (2021) has been submitted to the European Commission. «Convert the building stock to carbon-free and highly energy efficient by 2050» 2. Legalisation fine deduction for energy efficiency/structural interventions that have been completed until July 2011. Expenses made to increase the energy efficiency or structural resilience of these buildings can be discounted from the fine to be paid up to the percentage of 50%. 3. The "Saving 2021" programme is a residential energy upgrade programme, which provides incentives for energy saving interventions aiming to improve the energy class of residences by at least three (3) categories. The investment includes distinct incentives to support poor and vulnerable households in the form of an increased grant rate and a separate budget of €100 million.
Social care	1. A **Heating Allowance** is given to consumers who are using heating oil, gas, or biomass to aid with heating expenses and compensate for the increase in fuel prices over the last few years.

	2. **Minimum Guaranteed Income/Social Solidarity** income is a monthly welfare allowance to act as a safety net for vulnerable households to tackle the effects of poverty and avoid social exclusion. It combines (a) Income aid, (b) access to complementary social services, benefits, and goods, and (c) social tariff for electricity, water supply, and municipal costs. 3. **Housing Allowance** is a welfare rent subsidy programme for households renting their main residence. It provides financial aid to cover (partially) the cost of rent for vulnerable households as an effective social protection system for the first home.
Policy to promote community-ownership of energy	**Law 4513/2018** defines the Energy Communities (ECs) as civil cooperatives exclusively active in the energy sector with the aim of promoting social and solidarity-based economy and innovation in the energy sector, addressing energy poverty, and promoting energy sustainability, production, storage, self-consumption, distribution, and energy supply, enhancing energy self-sufficiency/security in island municipalities as well as improving energy efficiency in end-use at a local and regional level. Municipalities and Regions that plan to support energy vulnerable households through energy communities' schemes, will be supported through various funds. The current Law has not been updated since its formation while the Renewable Energy Directive Recast (RED II) has not yet transposed to the national law.
Policy to promote (collective) finance/crowdfunding	Law 4920/2022 incorporated the Directive 2020/1504 into the Greek legal framework and adapted the national legislation to EU Regulation 2020/1503, regarding the framework of crowdfunding services for businesses. In particular, the crowdfunding regulatory framework has been updated to remove barriers to cross-border crowdfunding within the EU. It also regulated the issue of the operating license of crowdfunding service providers to avoid the need of multiple licenses within the EU.
The energy market (e.g., social tariffs/tax incentives)	**Social household tariff:** Vulnerable households which fall under certain categories regarding their income, property

	value and health conditions are entitled to discounted electricity charges and other additional benefits. **Tax deduction for renovation costs:** This is a financial incentive available to citizens (not only homeowners) who perform building renovation works, including energy efficiency interventions. 40% of the cost of the works is discounted from the annual income tax for a period of 4 years. **Energy efficiency obligation schemes (Law 4342/2015 of the Greek Parliament):** within the energy efficiency obligation scheme fuel and energy service providers, electricity suppliers etc. are obliged to use their own capital to meet national energy efficiency targets while consumers are safeguarded and not burdened with added costs. The provisions for addressing energy poverty include a premium for energy savings as a result carrying out technical and/or behavioural measures in energy vulnerable households (coefficient of 1.4). Modifications are expected with the aim of improving both the operation and the efficiency of the scheme and especially motivating obligated actors to embark on more technical interventions. **Social Care Tariff:** Tariff Applicable to public legal entities and NGO that provide social care services and is provided by all electricity suppliers. **Power Pass:** The Electricity allowance (Power pass) subsidies the electricity bills to consumers with variable tariffs for the year 2022. Its amount and the beneficiaries are determined by social and economic criteria. **Recycle-replace appliances**: Subsidy for replacement of old and energy-intensive electrical appliances is provided to citizens to replace old and energy-consuming electrical appliances with new, more efficient ones. The programme covers the replacement of air conditions, refrigerators and freezers, and the subsidy is higher for low-income households. **Electricity subsidy:** Horizontal electricity subsidy is provided to all electricity consumers through the "Energy Transition Fund" to support the low-voltage electricity consumption

	bills. It is applied to all consumers without exception, regardless of income or other property criteria (households, businesses, businesses, etc.). The amount of the subsidy per MWh varies according to the consumer's tariff, while it is higher for the energy poor. **Gas subsidy:** horizontal gas subsidies are provided to all gas consumers (households and businesses) to support them against the skyrocketing gas prices. The subsidy is applied to all consumers without exception, regardless of income or other property criteria and it is foreseen to cover the 50% of the last year increases. The amount of the subsidy per MWh varies according to the consumer's tariff. **Biomass grant:** provision of free biomass (firewood) for the residents of mountainous areas. The actions will be organized either as a community or individually, under the supervision of the relevant forestry authorities, in order to cover the needs for the winter period.
Consumer protection	Special protective measures are provided (by all electricity and gas suppliers) to enable vulnerable energy consumers to access the full benefits of the liberalised energy market, which may not be otherwise available due to issues such as energy affordability. The definition of **energy vulnerable people** has also been introduced in the Greek national legal framework (Law 4001/2011). These measures consist of a deadline of forty days for the payment of electricity bills, the possibility for partial and interest-free payment of the electricity bills, suspension of the supplier's capability to order the disabling of the electricity meter (electricity cut off) due to outstanding debts during the winter period (November to March) and the summer period (July and August) as well as stricter conditions for the termination of the electricity supply contract by the supplier. As per the gas safety net, this has been enhanced to prohibit interruption of supply due to debts for consumers suffering from serious health problems, the advance payment for the inclusion of vulnerable customers in a settlement of overdue debts is abolished and the number of instalments for settlements is reduced.

SECAPs	Out of the total 332 Greek municipalities, 230 are signatories in the Covenant of Mayors initiative. Only a part of these signatories (83) have declared commitments for energy poverty mitigation on the CoM platform (identifying their SECAP was not easy for the most of them). However, only a few municipalities have actively promoted energy poverty mitigation actions. The Greek partners of the C-track50 H2020 project (EPU-NTUA, EPTA) have supported the development of Decarbonisation plans to 2050, for 11 Greek Municipalities (Aliartos, Varis-Voulas-Vouliagmenis, Chalkideon, Elliniko-Argiroupoli, Eretria, Faistou, Farsala, Ilioiupolis, Loutraki, Pylou-Nestoros, Vrilissia) that replaced their previous SE(C)Aps, and have included a strategy and relevant actions for combating energy poverty. The energy poverty mitigation actions proposed in C-TRACK 50 Decarbonisation plans are under three categories: • **Training and educational activities**: awareness-raising campaigns, workshops for students, establishment of energy poverty municipal offices, and more. • **Energy efficiency measures**: classification of domestic energy efficiency measures, use of EPC schemes, collective renovations (blocks, neighbourhoods). • **Use of renewables**: Net-metering projects, RES energy communities, energy contracts. POWERPOOR Greek partners have supported municipalities to promote energy poverty mitigation actions. Four of them (Municipality of Kalamata, Municipality of Tripoli, Municipality of Domokos, Municipality of Aigialeia) have already introduced the energy poverty pillar in their SECAPs with actions such as creation of an energy poverty mitigation office, awareness campaigns, and creation of an online platform. Two more municipalities (Municipality of Souli, and Municipality of Messini) have established an energy poverty mitigation office and have launched public awareness campaigns.
Public awareness	**Provision of targeted awareness-raising and training activities**, both for the energy-poor households, and the professionals who will be involved in supporting vulnerable households. The activities include information regarding the

	practices of facilitating the repayment of energy products, the existing protection measures, the availability of financing, etc. The **Price Comparison Tool** for energy products, provided by the Greek Regulatory Energy Authority, is an open platform for comparing prices and terms of tariffs offered by electricity and natural gas providers. In addition, it is possible to form complaints and requests to Network Operators and Electricity and Gas Service Providers, with monitoring of the progress of the request.

The Greek Government and the Ministry of Environment and Energy have announced several actions for 2022 and 2023, that can have a positive impact on the mitigation of energy poverty. The actions are:

- The **Save and Renovate** programme for 20,000 young people with subsidies of up to 30,000 euros to renovate their homes with energy saving interventions to be included.
- A **renovation subsidy** of 10,000 euros to 10,000 owners of closed properties with the aim of being provided for renting purposes.
- **Rewards in tariffs** for those households that reduce their electricity consumption.
- Extra space on the electricity grid for small RES projects, specifically for self-producers and energy communities or small investments.
- **Subsidies for 250,000 new rooftop PV units** for citizens (households), businesses, and rural uses.
- **New social housings buildings** to provide up to 2,000 new homes.

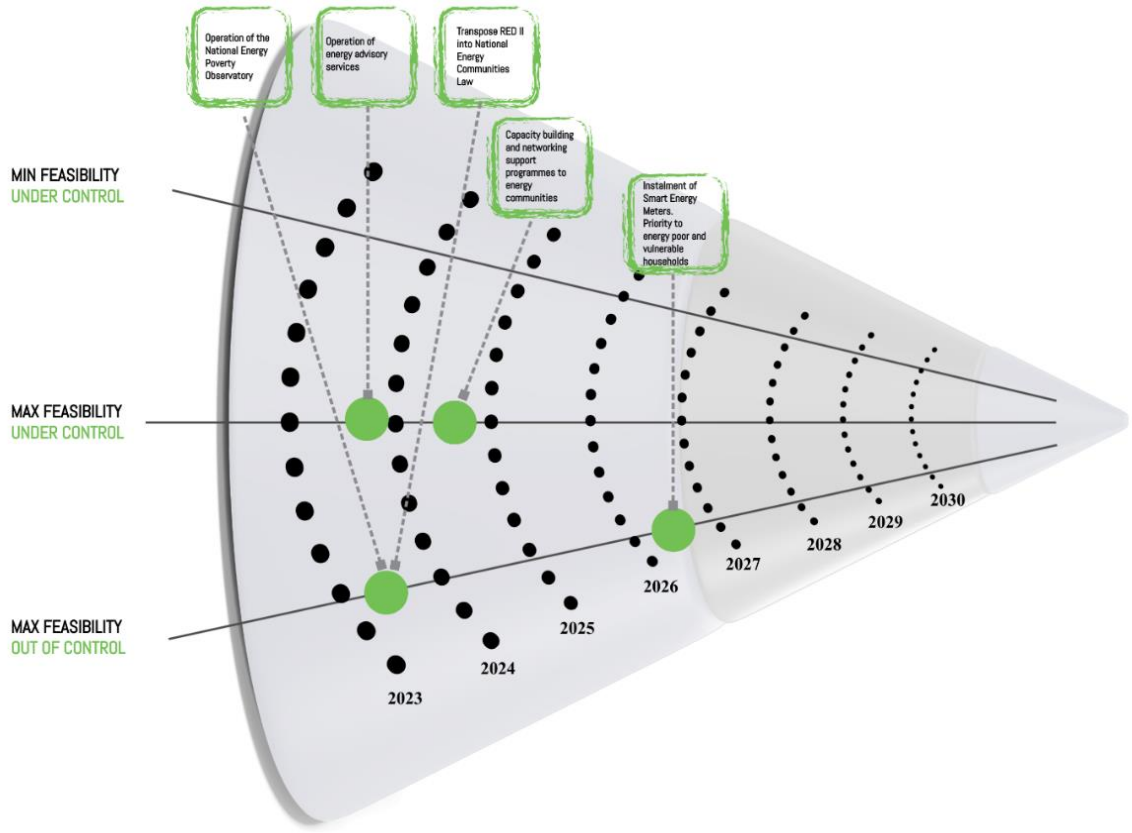
Step 3: Set Vision, envision Actions, and define Indicators

During the meeting with the national Stakeholder Liaison Group, the members were informed that 23 actions have been identified and will be presented, evaluated, and discussed during the meeting. The evaluation process was based on two axles, a) the impact that the proposed actions can have on the national energy poverty mitigation target, and b) the effort needed for each one of them to become operational and publicly available. Prior to the proposed actions' impact and effort evaluation, an overview of the POWERPOOR developments was presented as those have been captured during the 2-year project operation, also recalling the objectives of the project, according to which the POWERPOOR project aims to address energy poverty.

The meeting continued with a presentation of the national policies assessed and how those are directly or indirectly linked to the phenomenon of energy poverty and under which the 23 proposed actions were prepared. The members of the SLG evaluated the national policies, and their views were considered during the formulation of the final version of the national roadmap. The national roadmap developed under the POWERPOOR project considers the State's policies, utilising the tools and mechanisms that already exist, aiming to achieve optimum results. Through the vis.me tool, SLG members were asked to categorise the impact and the effort needed for the proposed actions using the "low," "medium" and "high" options.

The below figures present the needed changes to mitigate energy poverty in Greece under the scope and evaluation of feasibility and control, while presents the impact and the effort needed for the proposed policy actions to be realised.

Figure 19 Greece Future Radar



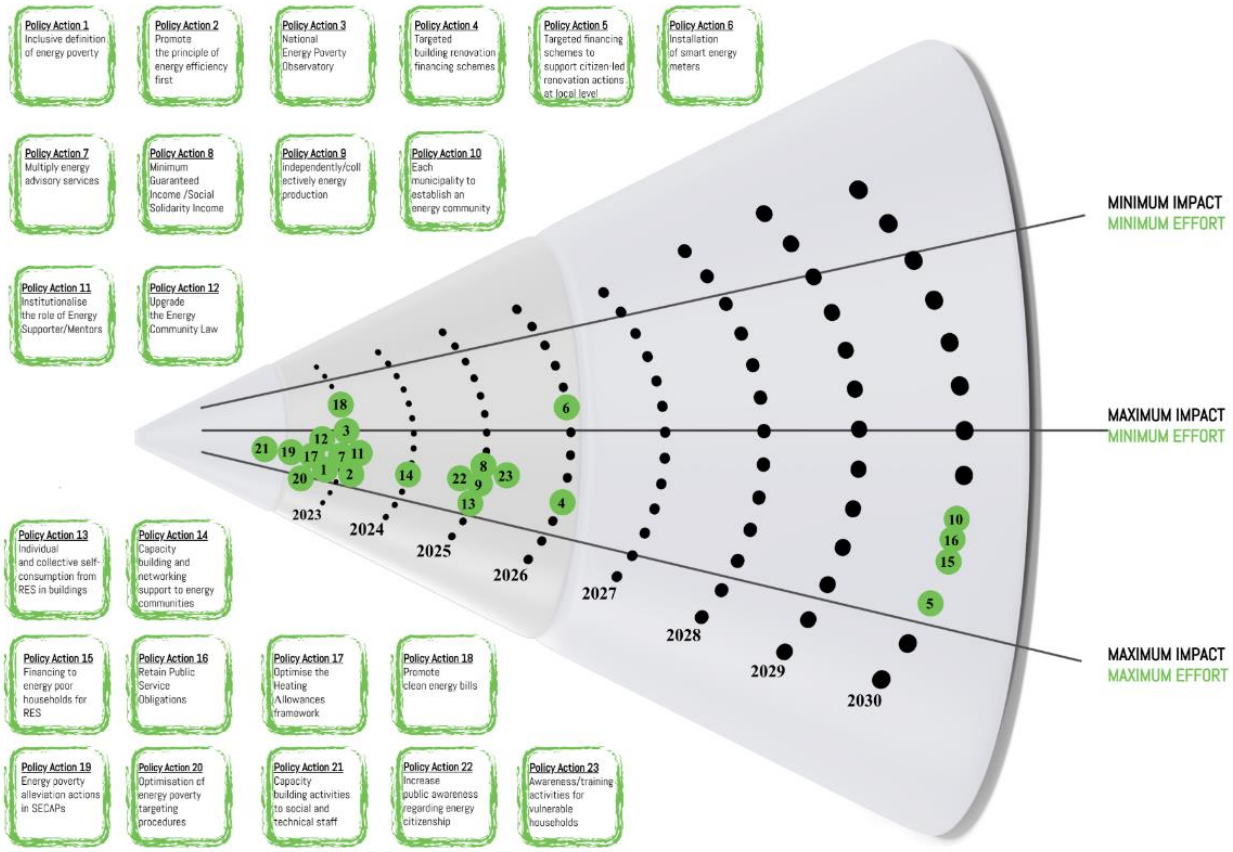


Table 27 Greece Actions

Policy Sector	Actions to be implemented	By when?	By whom?
National Energy and Climate Plans (NECPs)	Agree on an inclusive definition of energy poverty, in alignment with EU energy strategy and initiatives (Green Deal, REPowerEU, Renovation Wave, EPAH), as well as aligned with the Greek National Energy Poverty Plan (NEPAP)	2023	**Ministry of Environment and Energy**, Ministry of Health, Ministry of Labour and Social Affairs and Ministry of Finance. Consultation is needed with the NGOs, civil society organisation, and citizen-led actors.
	Promote the principle of energy saving/energy	2023	**Ministry of Environment and**

	efficiency first (behavioural changes , building retrofits) in energy planning to minimise the need for energy use. In addition, to consider the EPBD revision (Minimum Energy Performance Standards - MEPS, Smart Readiness Indicator - SRI, Building Renovation Passports – BRPs etc.)		**Energy** in consultation with stakeholders as CRES, the Technical Chamber, and other organisations working in the energy efficiency field.
	Redesign, define and endorse the role of the National Energy Poverty Observatory	2023	**Ministry of Environment and Energy**, Ministry of Health, Ministry of Labour and Social Affairs, with the engagement and collaboration of various civil society organisations, NGOs, Think Tanks etc.
The building sector - renovation efforts	Targeted building renovation financing schemes (Saving at Home) to support the upfront costs for building renovation of energy poor households. Essential elements include: • Enhanced social criteria and regional criteria (e.g., for lignite regions) • Complementarity with the Energy Efficiency	2023-2030	**Ministry of Environment and Energy**, Ministry of Finance in consultation and collaboration of CRES, the Technical Chamber, and other organisations working in the

	Obligation Scheme to maximise the impact of the actions • Provisions for fair distribution of incentives and benefits between owners and tenants		energy efficiency field.
	Provision of targeted financing schemes to support citizen-led renovation actions at local level.	**2023-2026 phase A'** 2026–2030 phase B'	**Ministry of Environment and Energy**, Ministry of Finance, in collaboration with local/regional authorities, financing institutions, and energy communities
	Installation of smart energy meters and promotion of new digital technologies that can be used in assisting energy poor households to manage and optimise their energy needs	2026	**Ministry of Environment and Energy**, DSO, and electricity providers
Social care	Multiply energy advisory services, such as energy poverty mitigation offices and one-stop shops, given priority at local level (Municipalities, established energy communities, NGOs)	2023	**Local governments**, energy communities, NGOs (e.g., consumer associations, environmental organisations)
	Connect the Minimum Guaranteed Income /Social Solidarity Income with the Energy Poverty Mitigation	2023-2026 pilot phase of UBI	**Ministry of Labour and Social Affairs**, Ministry of

	Framework. In parallel, prioritise pilot implementation of the Universal Basic Income (UBI) in areas of high-energy poverty rates to gradually phase-out Social Solidarity Income.	2026-2030 scale-up of UBI pilots and gradual phase-out of Social Solidarity Income policy	Finance, For the UBI pilots: Local and Regional authorities in consultation with academia
	Self-production (independently/collectively) of a minimum amount of energy for all and ensure the supply (ban of disconnections) of the basic energy demand for the transition period.	2023	**Ministryy of Environment and Energy** Ministries of Finance/Health. The action should be in consultation with Academia, NGOs, local governments, energy providers, energy communities, chambers
Policy to promote community-ownership of energy	Each municipality to establish an energy community. The action should also foresee energy poverty mitigation at the local level.	2025 - 2030	**Local governments** with the support of the National Government and the collaboration of local associations/NGOs, civil society organisations and other local schemes.
	Institutionalise the role of Energy Supporter/Mentors	2023	**POWERPOOR Alliance**, National

	and establish an Energy Supporter/Mentor network.		Energy Poverty Observatory, NGOs, Academia, and civil society organisations
	Upgrade the Energy Community Law to become aligned with RED II. The Law should also include incentives for the energy communities' development based on their potential for greater social impact (e.g., prioritisation in connection to the grid or/and targeted financing support for energy communities aiming to alleviate energy poverty, increase social cohesion, and support the delignification.	2023	**Ministry of Environment and Energy**, energy communities, civil society organisations, NGOs, Think Tanks.
	Enhance individual and collective self-consumption from RES in buildings. Key-policy measures: • Integration of RES CSC schemes in the national framework in line with RED II, REPowerEU • Enhance the virtual net metering framework to allow energy sharing between the properties of the same owner • Provide incentives on PV installation works e.g., lower VAT, tax-deduction, possibility to sell the excess energy to the	2025	**Ministry of Environment and Energy** in consultation with civil society organisations, NGOs, energy communities

	grid/aggregator/energy communities		
Policy to promote collective finance/ crowdfunding	Provision of capacity building and networking support to energy communities that would enable them to advocate and secure appropriate support mechanisms.	2024	**Energy Communities**, civil society organisations, Think Tanks, NGOs
	Provide financing to energy poor households to participate in collective/community energy actions (renewable energy production, saving schemes, increase of energy efficiency, building renovations etc.).	2023-2030	**Ministry of Energy and Environment**, Ministry of Finance, Local/Regional authorities
The energy market (e.g., social tariffs/ tax incentives)	Subsidise rooftop PV installation and energy communities' membership of beneficiaries of the Social Residential Tariff through the Public Service Obligations levy.	Until all interconnections are concluded* *Anticipated by 2030	**Regulatory authority**, TSO (ADMIE), Ministry of Environment and Energy, local governments
Consumer protection	Optimise the heating allowances framework: **a)** restructure the policy to promote decarbonisation of the building sector and increase the energy efficiency with small interventions related, **b)** support for the coordination authority in the sectors of capacity building,	2023	**Ministry of Finance** Ministry of Environment and Energy

	technical assistance, and relevant tools' development.		
	Promote clean energy bills	2023	**Ministry of Environment and Energy**, Energy Regulatory Authority
SECAPs	Institutionalise the multi-level governance approach on designing energy poverty mitigation actions in SECAPs.	2023	**Local authorities**, regional departments, national authorities, relevant Ministries
	Optimisation of the targeting procedures (tools, set of indicators, methodologies etc.) to successfully identify the energy poor households and focused groups affected (immigrants, disabled, elderly etc.).	2023	**Local authorities**, National Energy Poverty Observatory, civil society organisations, NGOs
	Provide capacity building activities to social and technical staff of the local authorities for energy poverty diagnosis and mitigation.	2023	**Ministry of Environment and Energy,** Regional and local governments, associations, educational institutions, NGOs
Public awareness	Increase public awareness regarding energy citizenship via national awareness campaigns, local energy poverty mitigation offices that customise the campaign	2023	**National Energy Poverty Observatory**, local authorities, civil society organisations,

	to local context and an online tool that would help citizens and interested parts to access informative material.		NGOs, energy poverty mitigation offices, one stop shops
	Enhance the awareness/training activities to vulnerable households by the energy sector companies, under the Energy Efficiency Obligation Scheme	2025	**Energy providers, local authorities**

Table 28 Greece Action-Specific indicators

Indicator	Baseline (2022)	Target (date dependent on the action)
Operation of the National Energy Poverty Observatory	Inactive	2023
Instalment of Smart Energy Meters with priority to energy-poor and vulnerable households	Insignificant (pilot cases applied in 2014)	2026 120,000 energy-poor households have smart meters installed
Operation of energy advisory services (POWERPOOR Energy Poverty Mitigation Offices)	3	2023 increased no of Energy Poverty Mitigation Offices by 50%
Transpose RED II into National Energy Communities Law	n/a	2023
Capacity building and networking support programmes to energy communities	5	2024 Increased by 100%

Phase 2

Step 4: Implement Actions and apply POWERPOOR Toolkit

The concrete actions that have been defined previously, are presented according to the established/proposed timeline.

Table 29 Greece Action Elements

Action under the policy sector: National Energy and Climate Plans (NECPs) **Agree on an inclusive definition of energy poverty, in alignment with EU energy strategy and initiatives (Green Deal, REPowerEU, Renovation Wave, EPAH), as well as aligned with the Greek National Energy Poverty Plan (NEPAP).**	
The responsible entities (leading organisation is presented in bold)	**Ministry of Environment and Energy** Ministry of Health, Ministry of Labour and Social Affairs and Ministry of Finance and the National Energy Poverty Observatory. Consultation is needed with NGOs, civil society organisation, and citizen-led actors.
The target group for the action	All country citizens. Considering the energy crisis and the energy vulnerability, all citizens at any point can be energy poor, thus having a national definition this can support the design of actions and support programmes.
Action design	The leading organisation in collaboration and consultation with the other identified stakeholders should work together and conclude to a national definition based on the available indicators that are presented in the NEPAP and the available ones published by EPAH.
Scheduling	2023
Budget	0
Drivers	To support the citizens of the country, to secure them from entering the energy poverty door and to design proper

	support schemes based on the actual needs of the citizens, especially the vulnerable ones.
Barriers	Fragmented administration at Ministry level.
Action under the policy sector: National Energy and Climate Plans (NECPs) **Promote the principle of energy saving/energy efficiency first (behavioural changes , building retrofits) in energy planning to minimise the need for energy use. In addition, to consider the EPBD revision (Minimum Energy Performance Standards - MEPS, Smart Readiness Indicator - SRI, Building Renovation Passports – BRPs etc.)**	
The responsible entities (leading organisation is presented in bold)	**Ministry of Environment and Energy** in consultation with stakeholders as the Centre for Renewable Energy Sources and Savings (CRES), the Technical Chamber, and other organisations working in the energy efficiency field.
The target group for the action	The primary target group of this action is the building owners while the tenants, those who rent/lease properties, are the secondary target group. This is because it is unusual in Greece tenants who lease/rent properties to proceed with building interventions. The action concerns both public and private buildings.
Action design	Several improvements have been monitored in the national framework when it comes to buildings, though the road is still long. Buildings are core energy users while the national building stock is considered of inferior quality. The stakeholders, with the leadership of the Ministry of Environment and Energy should work together in enhancing the national building frameworks and codes to result in an efficient building stock with

	minimum energy requirements. A high energy efficient building stock minimises the energy poverty risk.
Scheduling	2023
Budget	**150,000 euros** The proposed budget will be used for the necessary studies to build the national SRI, MEPS, BRPs studies and roadmaps to be integrated in the existing national strategies.
Drivers	The country has ambitious plans regarding the building stock and its energy efficiency, thus this can act as a driver for the action.
Barriers	The continuous energy crisis and the insecurity leave no proper time for the design and implementation of the action, despite the fact that the action launch can solve many energy issues.
Action under the policy sector: National Energy and Climate Plans (NECPs) **Redesign, define and endorse the role of the National Energy Poverty Observatory**	
The responsible entities (leading organisation is presented in bold)	**Ministry of Environment and Energy**, Ministry of Health, Ministry of Labour and Social Affairs with the engagement and collaboration of various civil society organisations, NGOs, Think Tanks etc.
The target group for the action	One target group is the various public organisations and their decision makers while the second target group is the general public. The first one will benefit from the operation of the Observatory as monitoring the phenomenon of energy poverty and the results produced will lead to better decisions for support programmes and other actions. At the

	same time, the general public will benefit from the decisions made by the first target group.
Action design	The National Energy Poverty Observatory exists since 2014 but sadly, following the completion of the Operational programme "Digital Convergence 2007-2013" which included it, the National Energy Poverty Observatory's database has not been updated making the initiative appear inactive. Since the infrastructure and the operational model and knowledge exists, it only needs a decision to re-operate, with more advanced services now. The current energy situation and the increased energy poverty level constitute a perfect timing for the Observatory re-launch. Considering the energy urgencies, the action requires a collective approach with more stakeholders being activated and engaged. The Energy Poverty Mitigation Offices developed under the POWERPOOR project can also have a role in this action as can operate as satellites of the Observatory.
Scheduling	2023
Budget	**20,000 euros** The budget is for the launch of the Observatory and for operational expenses
Drivers	To tackle energy poverty and reach the goals set under the NECP, a monitoring and evaluation system for energy poverty indicators is needed which can be organised under the Observatory.

Barriers	There are no barriers identified for this action, especially since the knowledge and previous experience exists.
Action under the policy sector: The building sector - renovation efforts **Targeted building renovation financing schemes (Saving at Home) to support the upfront costs for building renovation of energy poor households. Essential elements include:** • **Enhanced social criteria and regional criteria (e.g., for lignite regions).** • **Complementarity with the Energy Efficiency Obligation Scheme to maximise the impact of the actions.** • **Provisions for fair distribution of incentives and benefits between owners and tenants.**	
The responsible entities (leading organisation is presented in bold)	**Ministry of Environment and Energy**, Ministry of Finance in consultation and collaboration of CRES, the Technical Chamber, and other organisations working in the energy efficiency field.
The target group for the action	120,000 energy poor households
Action design	This action is aligned with a similar action presented in the NEPAP targeting the renovation of 120,000 households facing the negative effects of energy poverty. The action aims to address energy poverty in the long term by improving the energy efficiency status of residential buildings of households affected by this phenomenon. In order to achieve the maximum of this action, the buildings' energy renovation should be combined with other actions and measure as the installation of renewable energy systems to cover the energy needs. The proposed action which targets vulnerable households and households facing energy poverty should and can be combined with the implementation of other building renovation and RES programmes.

Scheduling	2023-2030
Budget	**1,800,000,000 euros** For the budget calculation, it was estimated that an average energy renovation cost for a medium size house (70-90 m2) is 15,000 euros.
Drivers	This is a direct action for the relief of energy poor and vulnerable households. The energy poverty mitigation target set at the NECP is the main driver of the action.
Barriers	The main barriers are (a) the fund sources to implement the action, and (b) the identification of the actual beneficiaries for this action in order the impact to be at its maximum.
Action under the policy sector: The building sector - renovation efforts **Provision of targeted financing schemes to support citizen-led renovation actions at local level.**	
The responsible entities (leading organisation is presented in bold)	**Ministry of Environment and Energy**, Ministry of Finance, in collaboration with local/regional authorities, financing institutions, and energy communities.
The target group for the action	50 energy communities
Action design	The action proposes the launch of incentives (financial, administrative etc.) for energy communities to integrate ESCO type services in their business models in order those to be applied in either in their members or the community in general, prioritising the energy poor and vulnerable households.
Scheduling	2023-2026 phase A' 2026-2030 phase B'
Budget	n/a

Drivers	Enhance the role of energy communities
Barriers	Conflict of interest between registered ESCOs and energy communities that potentially can provide similar services.
Action under the policy sector: The building sector - renovation efforts **Installation of smart energy meters and promotion of new digital technologies that can be used in assisting energy poor households to manage and optimise their energy needs**	
The responsible entities (leading organisation is presented in bold)	**Ministry of Environment and Energy**, DSO, and electricity providers.
The target group for the action	All citizens but the starting point of the action should be the energy poor and most vulnerable households.
Action design	Smart meters are the best way to monitor the energy consumption and educate the consumer in energy use. The action should set the starting point from the households that are under energy poverty and those households considered more vulnerable to energy insecurities. The action should be applied then to all households. The Energy Supporters and Mentors trained under the POWERPOOR project can be considered for this action, having already performed house visits and understand the needs of the households while the Energy Poverty Mitigation Offices established under the POWERPOOR project can also provide information and guide the entities responsible for the action about the households needs at local level.
Scheduling	2026
Budget	**~1,000,000,000 euros** The national government and the DSO have already acted to this direction.

	According to the announcements 7,5 to 8 million smart meters are needed to cover the country's needs.
Drivers	To better monitor the energy use in households, resulting to households' education in proper and efficient energy use.
Barriers	Negative opinion for smart meter and unwillingness of households to install them due to various factors.
Action under the policy sector: Social Care **Multiply energy advisory services, such as energy poverty mitigation offices and one-stop shops, given priority at local level (Municipalities, established energy communities, NGOs).**	
The responsible entities (leading organisation is presented in bold)	**Local governments**, energy communities, NGOs (e.g., consumer associations, environmental organisations)
The target group for the action	The primary target group is the energy poor and vulnerable households while all citizens can benefit from the action.
Action design	This action is connected directly to citizens supporting them to identify, organise and implement solutions to alleviate energy poverty and secure them from energy insecurities. The action can build upon the already established Energy Poverty Mitigation Offices designed and organised under the POWERPOOR project also taking advantage of the POWERPOOR ICT Tools to identify the energy poor or the at energy risk citizens. The established Network of Energy Supporters and Mentors can be mobilised and supporting the action. Due to the direct connection to citizens, Municipalities should have a significant

	role in providing energy advisory services, ideally with the collaboration of other local actors such as energy communities, local associations, and civil society organisation. The advisory services can be provided physically, organised in a central location within the premises of the municipality, or digitally through a dedicated website for energy poverty mitigation and with support of a hot line while will answer to citizens' questions.
Scheduling	2023
Budget	**~30,000 euros** annually for each municipality that will launch energy advisory services.
Drivers	Support energy poor and vulnerable households mitigate energy poverty.
Barriers	Limited capacity of municipalities in terms of knowledge, personnel, and funds to implement the action.
Action under the policy sector: Social Care **Connect the Minimum Guaranteed Income /Social Solidarity Income with the Energy Poverty Mitigation Framework. In parallel, prioritise pilot implementation of the Universal Basic Income (UBI) in areas of high-energy poverty rates to gradually phase-out Social Solidarity Income.**	
The responsible entities (leading organisation is presented in bold)	**Ministry of Labour and Social Affairs**, Ministry of Finance For the UBI pilots: Local and regional authorities in consultation with academia
The target group for the action	All households eligible for the Social Solidarity Income (around 200.000 households across Greece). The starting point of the UBI pilot actions should be the energy poor and most vulnerable households, those living in

	areas of estimated high-energy poverty rates or at greater risk (e.g., lignite regions dependent on lignite-district heating systems).
Action design	The Minimum Guaranteed Income is a welfare programme provided to vulnerable households (income, property, and residence criteria) to tackle the consequences of poverty and avoid social exclusion. It is based on three pillars: a) income support, b) linkage with social inclusion services, and c) linkage with activation services aimed at the integration or reintegration of beneficiaries into the labour market and social reintegration. An additional linkage to local energy poverty mitigation offices and relevant local actors (e.g., energy communities, consumers associations, NGOs) is proposed in order to enhance the capacity of the beneficiaries on energy savings, rational use of energy and self-production of clean energy poverty. As per the second dimension of the action, the UBI is defined as an income support which can be given through the public sector (e.g., local/regional governments) to all citizens, regardless of their means of subsistence and patterns of behaviour, and which is individual, adequate, tax-free, and unconditional. This is a relatively new economic and social proposal, already being piloted in several parts of the world. The pilot implementation of UBI is currently debated in Greece. Integrating energy poverty mitigation in the UBI pilots can be pursued by means of selection of the

	geographical regions based on energy poverty rates estimations, through targeted informational campaigns and the convergence of the POWERPOOR approach and utilisation of POWERPOOR tools given the fact that local authorities will implement UBI locally.
Scheduling	2023-2026 UBI pilots and evaluation results of its impact on energy poverty mitigation at the local level 2026-2030 Scale up of UBI pilots to other areas and gradual phase-out of Social Solidarity Income.
Budget	n/a UBI proponents claim its financing is feasible, as it is expected to replace existing benefits
Drivers	To enhance income security and maximise the impact of targeted informational campaign on energy conservation, clean energy production and energy citizenship. In addition, time and resources will be saved from current bureaucratic social services' processes since the UBI will be provided unconditionally.
Barriers	The current barriers that were identified by representatives of local authorities in Greece were the perception of lack of financing resources, a false *"free money" perception* and barriers in the horizontal, nationwide implementation.
Action under the policy sector: Social Care **Self-production (independently/collectively) of a minimum amount of energy for all and ensure the supply (ban of disconnections) of the basic energy demand for the transition period.**	

The responsible entities (leading organisation is presented in bold)	**Ministry of Environment and Energy,** Ministries of Finance and Health. The action should be in consultation with Academia, NGOs, local governments, energy providers, energy communities, chambers.
The target group for the action	120,000 energy poor households. The action can then be expanded to more households.
Action design	This action is connected with the energy independency of the households and their empowerment to exit the energy poverty loop. The action should be designed alongside the energy renovation programmes while a prerequisite could be that the household should have implemented first energy upgrades for the energy needs to be covered by the self-production be the minimum ones. The action foresees initially a subsidy scheme of up to 60% of a 10kW PV roof top cost for 120,000 energy poor households, the same ones foreseen in the action "Targeted building renovation financing schemes (Saving at Home) to support the upfront costs for building renovation of energy poor households". The national government has announced (Nov. 2022) a subsidy programme for the application of roof PV systems with a capacity of 10kW for each household with the provision to be subsidised up to 60%. Despite the good will, the process will follow the "first come, first served" method, thus it is not guaranteed that the priority will be given to ones in need.
Scheduling	2023

Budget	**720,000,000 euros** (for the 120,000) The calculation results from the assumption that a 10kW PV roof system costs ~10,000 euros. In the occasion the cost is subsidised 60%, then the foreseen budget can cover the target of 120,000 energy poor households.
Drivers	This action will ensure that the energy poor households will never again face energy disconnection or limited energy services due to low income. In addition, the energy independency resulting from the combination of energy renovation and self-production saves money in the long-term from the national budget that is directed to support energy and vulnerable households to cover various needs (various subsidies and offerings).
Barriers	Limited financial capacity of the households to support the implementation of the action with the rest of the budget.
Action under the policy sector: Promote community-ownership of energy **Each municipality to establish an energy community. The action should also foresee energy poverty mitigation at local level.**	
The responsible entities (leading organisation is presented in bold)	**Local governments** with the support of the National Government and the collaboration of local associations/NGOs, civil society organisations and other local schemes.
The target group for the action	Municipalities
Action design	According to the EU Solar Strategy (2022), each municipality with more than 10,000 citizens should establish an energy community to cover its own needs and also offer energy to vulnerable and

	energy poor households. In order the target to be implement the municipalities need to be educated and trained both in terms of how to establish an energy community and in terms to identify the energy poor households in order the feasibility plan for the energy community to be reliable and operational. The lead is in the hands to municipal officers as the action is local, while collaboration with civil society organisations and NGOs is important to achieve the maximum of the action. POWERPOOR results, services and tools can support the main actors of this action as the ICT driven tools can support the identification of the energy poor households and, in addition, the training programmes developed under the programme can support the actor understand how to establish an energy community. The action targets 230 municipalities with more than 10,000 citizens according to 2021 census, out of the 332 that exist.
Scheduling	2025 – 2030
Budget	**11,500,000 – 23,000,000 euros** The budget concerns a financial support of 50,000 - 100,000 euros to each municipality (230 municipalities with more than 10,000 citizens) depending on their size and energy community model. The rest of the budget needed for the establishment of an energy community will be raised through a fund raising campaign and other available sources.
Drivers	To make municipalities more independent in terms of energy needs and to enable them to provide for a more

	sustainable and innovative social policy to their citizens
Barriers	Lack of interest from the side of municipalities to organise an energy community due to numerous factors, limited knowledge, limited capacity, and limited resources.
Action under the policy sector: Promote community-ownership of energy **Institutionalise the role of Energy Supporter/Mentors and establish an Energy Supporter/Mentor network.**	
The responsible entities (leading organisation is presented in bold)	**POWERPOOR Alliance**, National Energy Poverty Observatory, NGOs, Academia, and civil society organisations.
The target group for the action	Already certified Energy Supporters and Mentors and all interested individuals or groups willing to become Energy Supporters and Mentors.
Action design	The policy action aims to create a wide Network of persons that under the POWERPOOR training programmes and certifications will be created. The Network of Energy Supporters and Mentors will support various actions presented in this document, while the main beneficiaries of this action will be (a) the municipalities willing to organise energy advisory services and (b) the citizens that will benefit from the services offered under this action. The POWERPOOR Alliance will lead this action and in collaboration with other actors (local, regional, and national) will work towards the institutionalisation of the role of the Energy Supporters and Mentors.
Scheduling	2023
Budget	**50,000 euros**

	The budget will be used for awareness campaign, information workshops and other networking activities.
Drivers	Increase the capacity of Municipalities in providing support to the citizens.
Barriers	Lack of interest of the target group(s) to support this action, including the lack of interest of Municipalities to include such services in their structure.
Action under the policy sector: Promote community-ownership of energy **Upgrade the Energy Community Law to become aligned with RED II. The Law should also include incentives for the energy communities' development based on their potential for greater social impact (e.g., prioritisation in connection to the grid or/and targeted financing support for energy communities aiming to alleviate energy poverty, increase social cohesion, and support the delignification.**	
The responsible entities (leading organisation is presented in bold)	**Ministry of Environment and Energy**, energy communities, civil society organisations, NGOs, Think Tanks.
The target group for the action	Group of citizens, authorities, SMEs interested in establishing an energy community.
Action design	The Ministry should act in completing the upgrade of the Law. Other actors should push the government in completing the process the soonest possible.
Scheduling	2023
Budget	0
Drivers	Provide more support to the groups interested in establishing an energy community.
Barriers	As this action is straight forward, there are no specific barriers for not concluding this action in the proposed timeframe.

Action under the policy sector: Promote community-ownership of energy **Enhance individual and collective self-consumption from RES in buildings. Key-policy measures:** • **Integration of RES schemes in the national framework in line with RED II, REPowerEU.** • **Enhance the virtual net metering framework to allow energy sharing between the properties of the same owner.** • **Provide incentives on PV installation works e.g., lower VAT, tax-deduction, possibility to sell the excess energy to the grid/aggregator/energy communities.**	
The responsible entities (leading organisation is presented in bold)	**Ministry of Environment and Energy** in consultation with civil society organisations, NGOs, energy communities.
The target group for the action	All households
Action design	The action focuses on the advancement of the legal framework and the inclusion of key policy measures to support and achieve a maximum outreach of self-production/consumption. To achieve this, consultations with various actors and stakeholders are needed in order to present a cost-effective and sustainable model that will benefit all parties, including the relevant ministries.
Scheduling	2025
Budget	n/a
Drivers	Promote self-production that leads to a more sustainable way of living.
Barriers	Negative opinions from energy providers.
Action under the policy sector: Promote collective finance/ crowdfunding **Provision of capacity building and networking support to energy communities that would enable them to advocate and secure appropriate support mechanisms.**	

The responsible entities (leading organisation is presented in bold)	**Energy Communities**, civil society organisations, Think Tanks, NGOs
The target group for the action	Energy communities
Action design	This action is dedicated to energy communities that will support newly formed energy communities or under establishment energy communities to increase their capacity in advocating for assorted reasons including the design of support mechanisms. The action is straight forward, the capacity building will be provided by energy communities with experience though webinars, workshops, events.
Scheduling	2024
Budget	20,000 euros
Drivers	Energy communities are among the main tools to tackle energy poverty.
Barriers	No barriers have been identified. Some similar actions have been already implemented (webinars) as initiatives from well-established energy communities.
Action under the policy sector: Promote collective finance/ crowdfunding **Provide financing to energy poor households to participate in collective/community energy actions (renewable energy production, saving schemes, increase of energy efficiency, building renovations etc.).**	
The responsible entities (leading organisation is presented in bold)	**Ministry of Energy and Environment**, Ministry of Finance, Local/Regional authorities
The target group for the action	50,000 energy poor households
Action design	The action aims at the design of a financing model (subsidy or interest free loan) for energy poor households in order to raise the initial capital needed to

	participate in collective/community energy actions.
Scheduling	2023-2030
Budget	250,000,000 euros Considering an initial of 5,000 euros per energy poor household.
Drivers	Economic boost to energy poor households to tackle energy poverty.
Barriers	Low interest of households to participate in collective actions.
Action under the policy sector: Energy market (e.g., social tariffs/ tax incentives) **Subsidise rooftop PV installation and energy communities' membership of beneficiaries of the Social Residential Tariff through the Public Service Obligations levy.**	
The responsible entities (leading organisation is presented in bold)	**Regulatory Authority**, TSO (HEDNO), Ministry of Environment and Energy, local governments
The target group for the action	~340.000 vulnerable households, beneficiaries of the Social Residential Tariff (islanders residing in the non-interconnected islands, low-income households, multi-children's families, single-parent families, elderly, citizens facing serious health problems).
Action design	The Public Service Obligation (PSO) is a levy that was laid down in EU Directive 2009/72/EC with the aim to finance projects that ensure energy security and environmental protection. In Greece PSO is used to ensure that electricity is supplied at a price significantly lower compared to current tariffs for certain groups of citizens *(see description of target group for the action above).* The levy is financed by the rest of the consumers and

	is collected through the electricity bills, by all suppliers. As interconnections of islands to the mainland grid progress, the need to finance the provision of discounts to the islanders will be reduced and surpluses will be present in the PSO fund. The proposed action suggests that the abovementioned surpluses be used to support the energy independence of beneficiaries of the Social Residential Tariff, by subsidising rooftop PV installation and energy communities' membership targeting this specific group. Given the energy crisis, alternative means of financing the PSO levy should be explored in order to relief consumers that are currently burdened with the cost of this social policy through the already exorbitant electricity bills.
Scheduling	Until all interconnections are concluded* *Anticipated by 2030
Budget	45,000,000 euros yearly The budget is based on a study/report made by Greenpeace.
Drivers	Enhanced consumer protection and reduction of the permanent need to boost household income.
Barriers	Overburden of consumers that currently finance the PSO levy through the electricity bills.
Action under the policy sector: Consumer protection **Optimise the Heating allowances framework: a) restructure the policy to promote decarbonisation of the building sector and increase the energy efficiency with small interventions related, b) support the coordination**	

authority in the sectors of capacity building, technical assistance, and relevant tools' development.	
The responsible entities (leading organisation is presented in bold)	**Ministry of Finance** Ministry of Environment and Energy
The target group for the action	Low to medium-income households residing in single and multi-family buildings) with a focus on those located in colder areas/climate zones of the country. (For the period 2022-2023 beneficiaries of the heating allowance are estimated to be 1.3 million households)
Action design	A heating allowance is granted to single, married, cohabiting, or widowed persons to aid with their annual heating costs (fuel heating oil, lighting oil (blue kerosene), natural gas, LPG firewood, biomass, (pellets) or thermal energy through district heating). Income and property value criteria apply. The amount corresponding to each household is calculated based on meteorological and geographical parameters and ranges from €100 to €1600 for 2022. The aim of this policy is to help vulnerable households cope with heating costs and compensate for price increases in fuel which have been observed in recent years. The proposed action suggests that the abovementioned allowance be used to support the energy upgrade of beneficiaries of the heating allowance, by subsidising energy efficiency measures and rooftop PV installation.
Scheduling	2023
Budget	Equal to the annual budget for the existing heating allowance. For the period 2022-2023, this amounts to 300 million

	euros which will be shared by approximately 1.3 million households.
Drivers	More efficient distribution of funds to support long-term mitigation of energy poverty instead of perpetuating annual allowance. Economic boost to energy-poor households to tackle energy poverty.
Barriers	Legal and administrative barriers for eligible buildings and owners, similar to those of the energy efficiency scheme. Split incentives between rented and owned houses.
Action under the policy sector: Consumer protection **Promote clean energy bills.**	
The responsible entities (leading organisation is presented in bold)	**Ministry of Environment and Energy**, Energy Regulatory Authority
The target group for the action	All households
Action design	The action aims at the reconstruction of energy bills in such a way that will include only energy consumption-related costs, excluding additional charges that are not connected with energy.
Scheduling	2023
Budget	n/a
Drivers	Support consumers with clean and transparent energy bills
Barriers	The unwillingness of authorities to exclude additional costs and non-related tariffs from the energy bills.
Action under the policy sector: SECAPs **Institutionalise the multi-level governance approach on designing energy poverty mitigation actions in SECAPs.**	

The responsible entities (leading organisation is presented in bold)	**Local authorities**, regional departments, national authorities, relevant Ministries
The target group for the action	All citizens
Action design	The actors and stakeholders that are involved in the design and implementation of the SECAPs should agree that energy poverty mitigation actions should by default be included in the design or updates of SECAPs.
Scheduling	2023
Budget	n/a
Drivers	Municipalities taking the lead to support energy poverty mitigation.
Barriers	Low capacity (knowledge and technical) of the staff of the municipalties
Action under the policy sector: SECAPs **Optimisation of the targeting procedures (tools, set of indicators, methodologies etc.) to successfully identify the energy poor households and focused groups affected (immigrants, disabled, elderly etc.) including the optimisation of the data gathering procedures that needed for the targeting, to ensure validity.**	
The responsible entities (leading organisation is presented in bold)	**Local authorities**, National Energy Poverty Observatory, civil society organisations, NGOs
The target group for the action	Energy poor and vulnerable households
Action design	The municipalities should use the indicators developed by EPAH and the Covenent of Mayors and set their strategy to targeting energy poor and vulnerable households. This will help to better design energy poverty mitigation actions in SECAPs. The ICT Tools developed under the POWERPOOR project are useful tools to support the targeting process.
Scheduling	2023

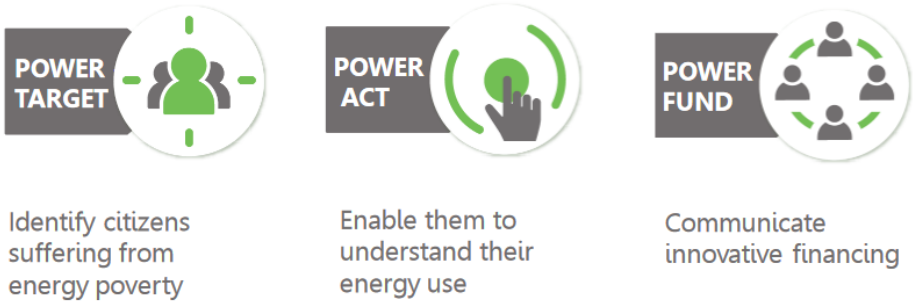
Budget	n/a
Drivers	Actual identification of energy poor and vulnerable households
Barriers	Unwillingness of local authorities' due low capacity and knowlegde for the domain of energy poverty.
Action under the policy sector: SECAPs **Provide capacity building activities to social and technical staff of the local authorities for energy poverty diagnosis and mitigation.**	
The responsible entities (leading organisation is presented in bold)	**Ministry of Environment and Energy**, Regional and local governments, associations, educational institutions, NGOs
The target group for the action	Local authorities (all 332 municipalities)
Action design	The central government in collaboration with the regional and local authorities and with the support should agree on the delivery of capacity building/training programme targeting the technical and social staff of the municipality to work towards the energy poverty diagnosis and mitigation. The action should be organised and delivered with organisations working on the domain of energy poverty mitigation. The capacity building programmes developed under the POWERPOOR project can set the basis for this activity.
Scheduling	2023
Budget	1,000,000 euros ~3.000 euros for each capacity building and support programme for the total of 332 municipalities. The budget can be reduced if the programmes will be

	organised in cluster municipalities (neighbourhood municipalities)
Drivers	Increase the capacity of the technical and social staff of the municipalities to address the phenomenon.
Barriers	Low interest and limited available time of the technical and social staff to participate in such actions. Low interest of the local authorities to engage in such programmes.
Action under the policy sector: Public awareness **Increase public awareness regarding energy citizenship via national awareness campaigns, local energy poverty mitigation offices that customise the campaign to local context and an online tool that would help citizens and interested parts to access informative material.**	
The responsible entities (leading organisation is presented in bold)	**National Energy Poverty Observatory,** local authorities, civil society organisations, NGOs, energy poverty mitigation offices, one stop shops.
The target group for the action	All citizens
Action design	All related stakeholders should work together in order to increase citizen's awareness on the energy poverty domain. National, regional, and local campaigns need to be designed and implemented while with the support and collaboration of local authorities, information days should be organised to educate citizens and provide them with tools and knowledge on how to deal with the phenomenon and how can be protected.
Scheduling	2023
Budget	**~1,000,000 euros** ~3,000 euros for the organisation of information days and information

	material for each one of the 332 municipalities.
Drivers	Empowering citizens
Barriers	Lack of public interest to implement such actions.
Action under the policy sector: Public awareness **Enhance the awareness/training activities to vulnerable households by the energy sector companies, under the Energy Efficiency Obligation Scheme**	
The responsible entities (leading organisation is presented in bold)	Energy providers, local authorities
The target group for the action	All citizens with priority to energy poor and vulnerable citizens.
Action design	Under the Energy Efficiency Obligation Scheme (active since 2017), the energy providers should collaborate with local authorities in order empower citizens through awareness/training activities. The awareness/training activities can be organised in more than one municipality for the economy of scale.
Scheduling	2025
Budget	n/a
Drivers	Citizens' empowerment
Barriers	Lack of interest to implement this action from both sides (energy providers and municipalities).

The POWERPOOR toolkit is incremental to the implementation of the individual actions and should be used actively by whichever stakeholder (e.g., municipality or POWERPOOR partner) has been identified, in the previous steps, as being responsible for implementation.

Figure 20 POWERPOOR Toolkit



Step 5: Monitor & Evaluate

One year after completion of the POWERPOOR project (or any other timeframe decided upon during the stakeholder consultations), the first monitoring & evaluation process should take place to see whether the roadmap's actions, and its vision, are being met. The exact indicators to be reviewed will depend on which ones have been choses in Step 2.

Table 30 Greece Action-Specific Indicators

Indicator	Baseline (2022)	Target (date dependent on action)	Target achieved?
Operation of the National Energy Poverty Observatory	Inactive	2023	
Instalment of Smart Energy Meters with priority to energy poor and vulnerable households	Insignificant (pilot cases applied in 2014)	2026 120,000 energy poor households have smart meters installed	
Operation of energy advisory services (POWERPOOR Energy Poverty Mitigation Offices)	3	2023 increased no of Energy Poverty Mitigation Offices by 50%	

Transpose RED II into National Energy Communities Law	n/a	2023	
Capacity building and networking support programmes to energy communities	5	2024 Increased by 100%	
Indicator	Baseline (2022)	Target (date dependent actions)	

This table tracks the progress of general energy poverty indicators leaning on the categorisation provided by EPAH.

Table 31 Greece General Energy Poverty Indicators

Indicator	Baseline (2022)	Target and Date (Vision)	Target achieved? YES/NO
Inability to keep home adequately warm % population	17% (2020 ELSTAT)	2025 10%	
High share of energy expenditure in income % Population	15% (2020 ELSTAT)	2025 10%	
Arrears on utility bills % of population	28% (2020 ELSTAT)	2025 18%	

Recommendations on how to implement the national roadmap

The above process will have resulted in a national roadmap which has been co-created with a diverse group of stakeholders from the POWERPOOR National Stakeholder Liaison Groups. Following the national policy dialogues and consultations, partners will reflect on the roadmap drafting process and can suggest additional recommendations to specific stakeholder groups on HOW the above-listed actions can be implemented. Recommendations should be aimed at the following groups and be included below:

For Sub-National Governments

The subnational governments should contribute actively to the dialogue for the definition of energy poverty by providing local and regional insights of the phenomenon.

Local and regional energy and climate planning should institutionalise the energy efficiency first principle (EE1st) as a cornerstone to their energy and climate planning. This will contribute to minimise the need for energy use, the energy costs, and the relevant needs for actions against energy poverty.

The municipalities should secure funds and political commitment for the establishment of EP mitigation offices/ one-stop shops. Doing so, municipalities will effectively target the EP households and support them, as well as run awareness campaigns.

The municipalities should create an energy poverty mitigation action team that will act as the municipal facility for the coordination of the relevant actions (support the EP mitigation offices, setup, financing and running of the energy community, design, and implementation of the EP actions, build in-house capacity etc).

Local authorities should promote interdepartmental cooperation and dialogue between different governance levels when planning energy poverty mitigation actions to address successfully the households' needs and be aligned with the legislative context.

Municipalities'' networks/ associations need to strengthen cooperation with national authorities, academia, and national energy poverty observatory to optimise targeting procedures (tools, set of indicators, methodologies etc.), data gathering procedures and capacity building activities for the municipal staff. This will enable local authorities to successfully identify the energy poor households and focused groups affected (immigrants, disabled, elderly etc.).

For National Government

The relevant ministries and national authorities should work on adopting one horizontal and inclusive definition of energy poverty. This definition should be aligned with EU and Greek national energy strategy and initiatives (Green Deal, REPowerEU, Renovation Wave, EPAH, Greek NECP, NEPAP). Co-creation with all the interested actors (authorities, institutions, and bodies) from local to national context is a prerequisite, so as the definition to be applicable to all governance levels (local, regional, national).

The Ministry of Environment and Energy should promote the EE1st principle when planning energy poverty mitigation actions to minimise energy consumption and costs, as well as the need for new energy production units. This can be achieved by institutionalising the EE1st in energy and climate planning. Furthermore, the NEPAP should prioritise actions (that foresee subsidies) to energy efficiency/saving interventions.

The Ministry of Environment and Energy and the relevant authorities/organisations should redesign, define, and endorse the role of the National Energy Poverty

Observatory. It should act as an overarching facility, capable of providing valid data, tools, capacity-building activities, and information to all actors of all governance levels and areas of interest, interested in EP targeting and mitigation.

Targeted building renovation financing schemes (i.e., I am saving at home), that address specific needs of energy poor households, needs to be designed and provided. These schemes should incorporate social and regional criteria (e.g., lignite regions), be complementary with the Energy Efficiency Obligation Scheme and consider the different ownership cases (owner, tenants) to enable most of the energy vulnerable household face the high upfront costs and administrative burden. To be successful, a coordinated dialogue with all the stakeholders needs to be initialised.

The relevant ministries should work on identifying the needs and barriers that energy poor households face to participate in collective/community energy actions (renewable energy production, saving schemes, increase of energy efficiency, building renovations etc.) at local level. Working with civil society organisations and energy communities can provide valuable feedback. This will facilitate the design of targeted financing schemes to increase the participation of the energy poor households in energy communities.

The Ministry of Environment and Energy should join forces with the TSO and DSO for the acceleration of the smart energy meters and new digital technologies penetration, at least for the energy vulnerable households, to enhance the validity of data for the targeting of the energy poor and to enable demand response services for energy use optimisation.

The Ministry of Environment and Energy should institutionalise the self-production (independently/collectively) of a minimum amount of energy for all and ensure the supply (ban of disconnections) of the basic energy demand for the transition period. Intensive dialogue with the interested parts (local authorities, NGOs, private sector, energy communities) is needed to be coordinated by the ministry.

The relevant ministries should secure funding and provide technical assistance to all municipalities that want to establish an energy community. These energy communities must get additional funding for activities relevant to EP mitigation, so as the implementation of the respective action to be accelerated.

The Ministry of Environment and Energy should consult the energy communities' associations and other relevant actors to the upgrade of the Energy Community law favourable of energy poverty mitigation. Thus, the legislation will incorporate provisions based on the real needs of the energy poor, as well as enable energy community take advanced action in EP mitigation.

The Ministry of Environment and Energy should map and remove the administrative and technical barriers for the enhancement of the self-consumption schemes from RES in

buildings, to make them attractive for most households. Some of the barriers should be addressed in coordination with the TSO/DSO. Consultation with technical associations (i.e., TGC) and other actors will be helpful, as well.

The Ministry of Environment and Energy should optimise the heating allowances framework in such a way that promotes the fair clean energy transition for all. This entails the prioritisation of the energy efficiency/savings interventions financing against the fossil fuels subsidising. This must be supported by relevant actions on capacity building, technical assistance, and relevant tools development. Thus, energy-poor households will be supported to implement sustainable and clean solutions.

Greek Energy Regulatory Authority and the Ministry of Energy need to consider the establishment of clean energy bills as a measure that promotes consumers' awareness of their energy use, as well as relief of excessive costs that may lead a household to energy poverty. Energy providers need to be part of this.

For Civil Society

Civil society groups should contribute to the dialogue for the definition of energy poverty as their views on the issue can shed light on the social aspects of energy poverty, not previously identified.

Energy communities should work on mapping the challenges the energy-poor households face towards participating in community energy actions (collective self-consumption, citizen-led renovations, etc). This will be a valuable input to the national authorities that work on the upgrade of energy communities' law and the creation of relevant targeted financing schemes for the energy poor.

The civil society organisation needs to contribute to the dialogue for the redesign of building renovation financing schemes, as well as the self-consumption schemes, by providing insights about the challenges various social groups may face.

NGOs and civil society organisations need to combine forces with municipalities in the establishment of EP mitigation offices. This will enhance the efforts of targeting and addressing the multi-faceted phenomenon by giving local insights of the households in need.

Civil society along with national authorities and academia should work on the establishment of an energy supporter/ mentor network. The network can act as a resource of experts that can work in alignment with the National EP Observatory and the EP mitigation offices to maximise impact.

Energy communities should intensify their efforts on establishing networks between themselves and other actors (civil society, academia, authorities) to create mechanisms of mutual support and capacity-building opportunities. Additionally, combining forces

can strengthen their voices in relevant national consultations, such as the consultation for the Energy Community law upgrade.

Civil society actors need to be active in public awareness campaigns regarding energy citizenship by activating their communication channels, networks, and tools. Their communication strategy should consider the overarching EP mitigation plans (sub-national, national municipal) and adjust the message to their specific local/group context. Furthermore, these efforts can be combined with those of EP mitigation offices.

For The Private Sector

The private sector subject to the Energy Efficiency Obligation Scheme should cooperate with relevant ministries to align their actions with the foreseen redesigned building renovation financing schemes (Save at Home) for energy poor households. Smart energy meters and promotion of new digital technologies need to be part of these actions. Thus, different actors' efforts can be combined to have the maximum impact on energy poverty mitigation efforts without spoiling forces.

The DSO and TSO should upgrade their network infrastructures and digital tools that support the integration of self-consumption units under versatile schemes.

Energy providers and private businesses should promote actions regarding public awareness of energy poverty mitigation. These actions could vary, from the provision of tips and tools to customers/citizens that help them understand/minimise their energy use, to the communication of activities that are subject to the Energy Efficiency Obligation Scheme.

Energy providers should lead the way for the facilitation of the clean energy bills format. This must be done in coordination with the Greek Energy Regulatory Authority and the Ministry of Energy.

10. National Energy Poverty Mitigation Roadmap of Hungary

Introduction

The POWERPOOR project aims to help households living in energy poverty. Since the definition of energy poverty may vary at the national or regional level, it requires targeted actions. This roadmap summarizes existing national measures, stakeholder relations and provides policy recommendations for Hungary.

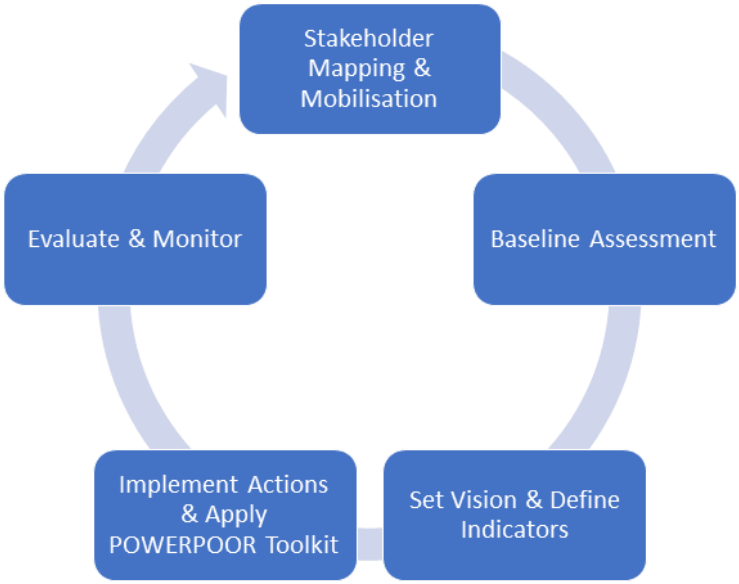
As part of the roadmap development, a Liaison Group workshop took place. The role of national stakeholders was analyzed and a vision was set for 2050, using appropriate modelling tools.
The stakeholder universe model illustrates the relative flexibility of stakeholders and their role in addressing energy poverty. The roadmap contains the Hungarian baseline assessment revision and recent changes in Hungarian energy policy are included. Currently existing measures tackling energy poverty are summarized and taken into consideration during formulating our recommendations.
The vision by 2050 is to fully eliminate energy poverty. The changes and policies required to achieve the goal are illustrated on future radar model. Based on the model results, targeted policy recommendations and measurable goals are formulated.
The first draft version was discussed with members of the Hungarian Liaison Group and the policy recommendations were adjusted according to their comments.

What is the methodology for the national roadmaps?

The development and adoption of the national roadmap is subdivided into two phases, which each encompasses specific steps on an integrated management cycle (adapted from ICLEI Green Climate Cities Programme). The cycle has been chosen as a basis for the roadmap since it promotes a holistic approach to policy making.

Phase 1 takes place until the end of the POWERPOOR project and includes steps which shall be carried out by partners and Energy Supporters and Mentors until then. Phase 2 takes place within one year after the project, or on any other timeline decided by the partners and stakeholders. Once the cycle has been completed a first time, the process can be repeated (and could potentially serve as a basis for future projects).

Figure 21 Roadmap Methodology



Adapted from ICLEI Green Climate Cities Handbook 2016

National Roadmap Development

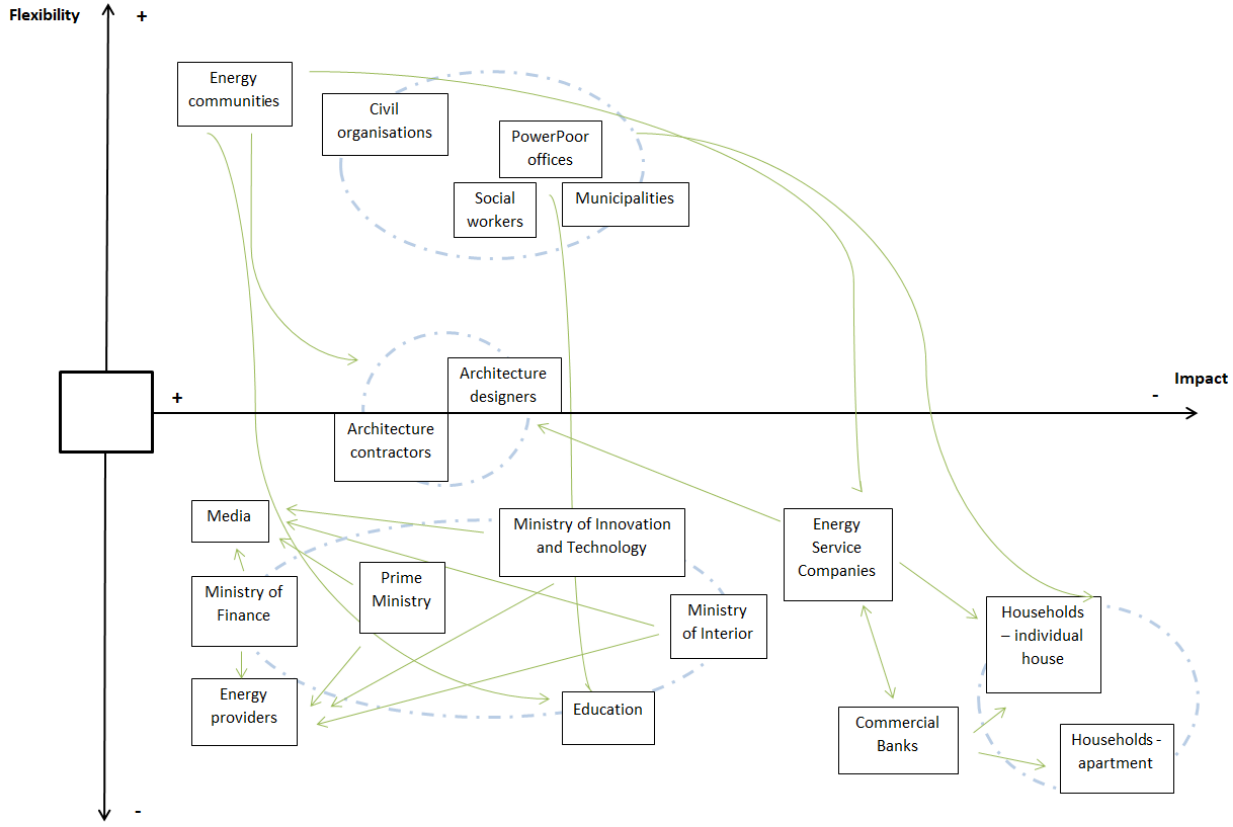
Phase 1

As part of the national roadmap development, a stakeholder modelling workshop was held on 7th of September, 2022. The participants were members of the Hungarian Liaison Group, like professor of University of Technology and Economics and representatives of civil organizations. The mix of participants' expertise consisted of building engineering, energy efficiency, green policy and social sphere. This resulted in a fruitful discussion, where various points of view were captured and visualized on the Stakeholder universe and Future radar models.

Step 1: Stakeholder Mapping

On the stakeholder universe model, group of stakeholders were analyzed in relation to 2 indicators – how much are they adaptable in terms of tackling energy poverty and how much impact they have in potential decision making. Adaptability is represented on axis Y, where on top is the most adaptable and on the bottom is the least adaptable. On axis X, the scale of impact was set descending - the closer the stakeholder is to the axis Y, the bigger potential it has in problem solution. This way, the relative importance of particular stakeholders groups in energy poverty mitigation was identified.

Figure 22 Hungary Stakeholder Universe



The most flexible and highest impact stakeholder in tackling energy poverty seem to be energy communities. This is due to their ability to adapt to the local needs and the variety of solutions they can provide. They have a significant potential to help vulnerable households. With joint effort even the low-income families can have access to renewable energy or other source which can help them to break out of energy poverty. However, we need to be aware of educational and other social obstacles of establishing an energy community in deprived settlements.

Civil society organizations are the ones working most closely with this issue. They are similarly flexible in their attitude and have a relatively big impact when it comes to arriving at solutions.

Close to the civil society organizations on the chart are the social workers and family helpers, PowerPoor offices and local municipalities. We can consider them as a group of stakeholders with similar interests and they work closely together.

On the middle of axis X there are the architecture designers and contractors. Their impact lies in their ability to renovate houses by applying insulation and instalment of

various equipment that increases energy performance of a building. They are moderately flexible and their interest is mainly economically driven.

Below the axis X there is a quite wide group of ministries. Ministry of Interior and Ministry of Technology and Innovation have a role in developing support schemes for energy transition and in the distribution of EU funds. Ministry of Finance could help eradicating energy poverty, for example, by redefining Hungarian taxation system. The Prime Ministry ensures the personnel, material and technical conditions necessary for the work of decision makers. Their impact varies from significant to moderate. The highest impact was assigned to Ministry of Finance, while the Ministry of Interior has only a moderate impact.

An important element on this chart is Media. It is less flexible due to the political control characteristic to Hungary, but its potential to address the problem is wide. According to Hungarian National Statistics Office, there are over 3.7 million television service subscribers. Along with other media channels, it is a powerful source for energy education, like sharing domestic energy saving hints.[33]

Education of vulnerable households is on the mid-bottom part of the chart with relatively big potential to positively impact energy poverty. Unfortunately, reforming education materials in public schools tends to be a long and burdensome process.

Energy providers, as one of the most significant players are tied to national regulations, making them one of the least flexible body. Obviously their impact is wide, given that they need to be involved even during establishing an energy community. They are placed on the bottom left corner of the chart, having the same high impact potential as energy communities. Their negative feature is inflexibility.

The last but not least important stakeholders on the chart are households living in energy poverty themselves. They have the least impact to tackle energy poverty due to lack of financial or informational resources. From flexibility standpoint it was important to differentiate between an individually standing house in energy poverty and an apartment in a condo. A family living in a house has little flexibility advantage due to being able to make individual decisions. Having the resources, they can perform renovations of various scale. In the meantime, any kind of large scale renovation of a condominium needs the agreement and contribution of all households living in there. This often means an obstacle in installing a house insulation and it is more difficult to achieve overall energy consumption reductions, since it requires behavioral changes of more families. Establishing energy community as a condo is a challenge for similar reasons.

[33] https://www.ksh.hu/docs/hun/xstadat/xstadat_evkozi/e_oni006.html

A clear connection is stated on the chart between households living in energy poverty and civil society organizations. This shows how closely the civil society organizations work with this problem and how significant they are on providing solutions on micro level.

On the chart, Ministries, the Media and Energy Providers are mutually connected, but there is no arrow connecting them to the households. This indicates the indirect impact of these bodies to energy poverty, but it might also show the lack of dedication to this problem.

Based on the above we can identify 4 main stakeholder categories from the chart: civil society organizations and their activities, public bodies such as ministries and education, households, and a small group of building renovation contractors. Other significant actors as media and energy providers can be classified to these categories to some extent.

The key takeaways from the stakeholder modeling are the following:

- Energy communities could play important role in tackling energy poverty in appropriate legal, political and educational circumstances. Pilot projects and modeling are ongoing, but a nationwide spread is still facing many obstacles.
- Civil society organizations work most closely on the issue, therefore they have the right expertise and flexibility in providing help. They have a significant impact on micro level.
- The media, ministries and energy providers have a large impact, but they operate in large scale, which impedes their flexibility.
- Households living in energy poverty have especially limited impact and flexibility in providing a solution.

Step 2 Baseline Assessment Revision

The state of play / baseline for what concerns energy poverty in the overall country has already been analyzed at the beginning of the project and captured in D4.2. Part of designing a national roadmap is revisiting the original assessment in the light of recent (geo)political and economic changes.

In period from 2015 – 2020, Hungary had the lowest energy prices amongst Powerpoor pilot countries. The housing costs in disposable income was 13.5% in 2019, decreased to 13.3% in 2020, the 5th lowest in the EU.

Housing cost overburden in 2020 was affecting 10.1% of population living in cities, slightly above EU average. In rural areas it is 2.2% of population, which is below the EU average.[34]

Based on Eurostat data from 2021, 5.4% of population in Hungary is unable to keep their home adequately warm and 9.7% of households have arrears on utility bills.

Figure 23 Eurostat Statistics on Energy Poverty in Hungary

	Inability to keep home adequately warm (households %)	Arrears on utility bills (households %)
EU27	6.9	6.4
HU	5.4	9.7

Source: Eurostat: Statistics | Eurostat (europa.eu) European Union Statistics on Income and Living Conditions (EU-SILC) 2021

It is a reasonable assumption that all the above indicators will change in a negative way. Current geopolitical conflicts resulted in a revision of utility bill caps in force since 2013 in Hungary. As of August 1st, 2022, reduced energy pricing is applicable for only electricity consumption up to 2523 kWh/year and natural gas consumption up to 1729 m3/year. Although discount for large families remains in place, residents will pay the retail market price for consumption exceeding the limits.[35]

The regulation does not apply for around 8.4% of households using district heating. Majority of households are heated with natural gas (57.6%) and biofuel, mainly firewood (31.1%). Considering the increase in natural gas and firewood prices together with poor energy efficiency of Hungarian houses, we expect an increased number of families to fall into energy poverty.

The key national action plans mitigating energy poverty are National Energy Strategy (NES) 2030 and National Energy and Climate Plan (NECP) of Hungary.

NES supports afforestation of land and the cultivation of energy crops, which would enable the production of local energy sources. It plans to introduce smart meters which would help the vulnerable consumers in avoiding debt. The Social Welfare Considerations subchapter includes number of social measures.

Energy poverty already has its subchapter in NECP. It highlights the role of Mátra Power Plant as source of salary, as well as electricity, for the people in the region. It aims to help the vulnerable social groups by maintaining suitable overhead costs, expansion of prepayment meters and increasing awareness.

[34] https://ec.europa.eu/eurostat/cache/digpub/housing/bloc-2b.html?lang=en

[35] https://www.portfolio.hu/gazdasag/20220811/rezsiemeles-2022-mutatjuk-mit-kell-tudni-es-hogyan-kuzdhetsz-a-horrorisztikus-rezsiszamlak-ellen-560661 (11.8.2022)

As part of a social care policy, socially deprived and disabled customers can claim protected consumer status. Municipalities with a population of less than 5,000 can apply for the social fuel support program, and from the amount thus obtained, they purchase solid fuel, which is distributed to households in need according to locally determined conditions.[36]

The table below contains key policy areas and lists plans and strategies which aim to mitigate energy poverty.

Table 32 Hungary Baseline Assessment Revision

Sector	Respective policies to mitigate energy poverty
The building sector - renovation efforts	**National Building Sector Strategy** It identifies the main goals and routes for the modernization of the domestic real estate stock and a significant reduction in energy demand until 2020, and contains forecasts until 2030. It defines a conceptual framework for building energy action plans and plans specific programs and actions for later implementation. **Environmental and Energy Efficiency Operational Program Plus (KEHOP Plus)** KEHOP Plus is expected to fund the deep renovation of residential and commercial buildings for energy efficiency (co-financed by Cohesion Fund), but a similar plan has been retracted in the previous programming period resulting in a significant backlog in this field by now. **Home Warm Program (Otthon Melege Program)** Funding from the national budget is available to families for the (energy efficiency) renovation of residential buildings. The amount of the non-repayable grant is between 10 and 50 percent of the eligible costs, up to a maximum of HUF 350 000 per dwelling and up to HUF 75 million per application.[37] A

[36] Nemzeti Energia- és Klímaterv

[37] https://palyazatok.org/otthon-melege-program/

	missed opportunity is that subsidies are not linked to any condition on energy efficiency improvements, in many cases the funding has only been used for aesthetic interventions. The adequacy of the technical solutions implemented was not ensured. **RenoHUB** The overall aim is to boost the energy modernization of Hungarian homes by developing an integrated business model. RenoHUB offices are covering a full spectrum of services related to renovation. **Long Term Building Renovation Strategy** Aims for achieving a sustainable, energy and cost-efficient domestic building stock by 2050 through energy efficiency, value, comfort and health improvements measures, renewable energy and smart technology usage. Specific programs will be designed and implemented for vulnerable households. - 20% energy savings in the domestic residential building stock by 2030 - 60% reduction in carbon dioxide emissions from the energy use of buildings by 2040 compared to 2018-2020 average levels - By 2050, the percentage of buildings meeting near-zero energy demand levels should reach 90% - Achieve a building renewal rate of 3% per year by 2030[38]
Social care	**Maltese Charity Program for Developing Municipalities** A comprehensive program to help 300 of Hungary's most disadvantaged municipalities to upgrade. An

[38] https://energy.ec.europa.eu/system/files/2021-07/hu_2020_ltrs_0.pdf, p.5-9

	initiative that helps people to break out of intergenerational poverty.
Policy to promote community-ownership of energy	Energy communities are almost non-existent in Hungary - some (financially strongly supported) bottom-up communities can be found as pilots but no technical support, favourable regulatory environment and predictable financial incentives are available to spread their existence. Ad-hoc awareness-raising and education is only carried out by a few NGOs, reaching only a small proportion of the population. Although community energy has been defined and added to the Electricity Act, and the first community energy pilot project had been tendered by the state, the circumstances in which the pilot projects can be carried out runs counter to the principles and tools needed to create energy communities. The framework for electricity/energy communities has only been set up in 2020, and it is still immature: it only covers renewable electricity production and detailed regulation is missing. Currently available **Recovery and Resilience Plan** of Hungary includes respective investment among the most deprived settlements, but significant social problems in these territories makes the success of this program doubtful. Component C of the Plan is dedicated to Improving Municipalities. 77.47 billion HUF is aiming to support complex and integrated development of the 300 most disadvantaged municipalities identified on the basis of objective criteria. Two investments were defined: building and renovation of existing social buildings, improving housing conditions and **community renewable energy generation and use**. The investment will install small-scale solar power plants, the benefit of which will be used for social housing. It plans to increase renewable community energy production

	capacity to 25000 KWp by 2025 and related legislative change by 2023.[39] **KEHOP Plusz** Supports the establishment of local energy communities, encouraging community heating and cooling from renewable energy resources. It emphasizes the importance of decentralized, renewable individual heating and community heating. Accountable within this program, among others, are renewable electricity generation on individual and collective basis and related cost-effective groundwork; Investment in a biomass and geothermal-based community heating plant.[40]
Policy to promote (collective) finance / crowdfunding	Hungarian websites allowing crowdfunding are www.adjukossze.hu; www.brancskozosseg.hu, and https://tokeportal.hu/ (this latest for start-ups mainly). First energy community in Hungary had a successful campaign at Adjukossze.hu. There is no specific national regulation for crowdfunding in Hungary, legal guideline for crowdfunding is the European Regulation on Crowdfunding Service Providers.
The energy market (e.g. social tariffs / tax incentives)	Households' utility cost reduction program allows energy prices to be independent from market prices and have fixed them at a low level (since 2013). It covers natural gas, electricity, district heating, piped water services. Reduced energy costs (caps) are eliminated for above-average consumption since 08.2022, that will likely seriously affect those living in energy poverty, who usually live in buildings with poor energy performance. There is no carbon or energy tax on residential households. Taxes on heating and electricity

[39] Magyarország Helyreáálítási és Ellenállóképességi Terve (Resilience and Recovery Plan of Hungary), p.101-122
[40] Környezeti És Energiahatékonysági Operatív Program Plusz, p.84-85

	consumption are currently only included in the energy pricing of consumers belonging to the non-residential category (those with a consumption exceeding 1320 kWh). In addition, the government has also maximized fuel prices from November 15, 2021 due to rising world market prices.
Consumer protection	**Consumer Protection Office at Budapest Capital Government Office (Fogyasztóvédelmi Rezsipont BP Főváros Kormányhivatala)[41]** Limited opening hours every day in 5th district of Budapest. Its main task is to inform consumers in electricity-related areas about the relevant legal requirements, the official procedures that consumers can initiate and the options of redress available to them.
SECAPs	Energy poverty is mandatory element of SECAPs since 2020, indicators to be mandatorily applied only from 2025. Quality of SECAPs is variable and implementation of recommended measures is questionable (mostly due to lack of financial resources and human capacities). **SECAP for Jozsefvaros Municipality (joint municipality of PowerPoor project)** Supporting low-cost policies (education, workshops) and interest-free loan options for large household appliances modernization. Aiming to modernize 20% of municipality's family houses and 35% of apartment buildings. In 90% of households, the old refrigerator should be replaced by a new one by 2030. Jozsefvaros Municipality's SECAP includes a section dedicated to energy poverty. It recommends to collect data from home visits as per the powerpoor methodology, which allows to develop more targeted measures. Implementation of this measure is ongoing.

[41] http://real.mtak.hu/110555/1/3619-ArticleText-16664-1-10-20200616.pdf, p.15

Step 3: Setting vision, envision actions and define indicators

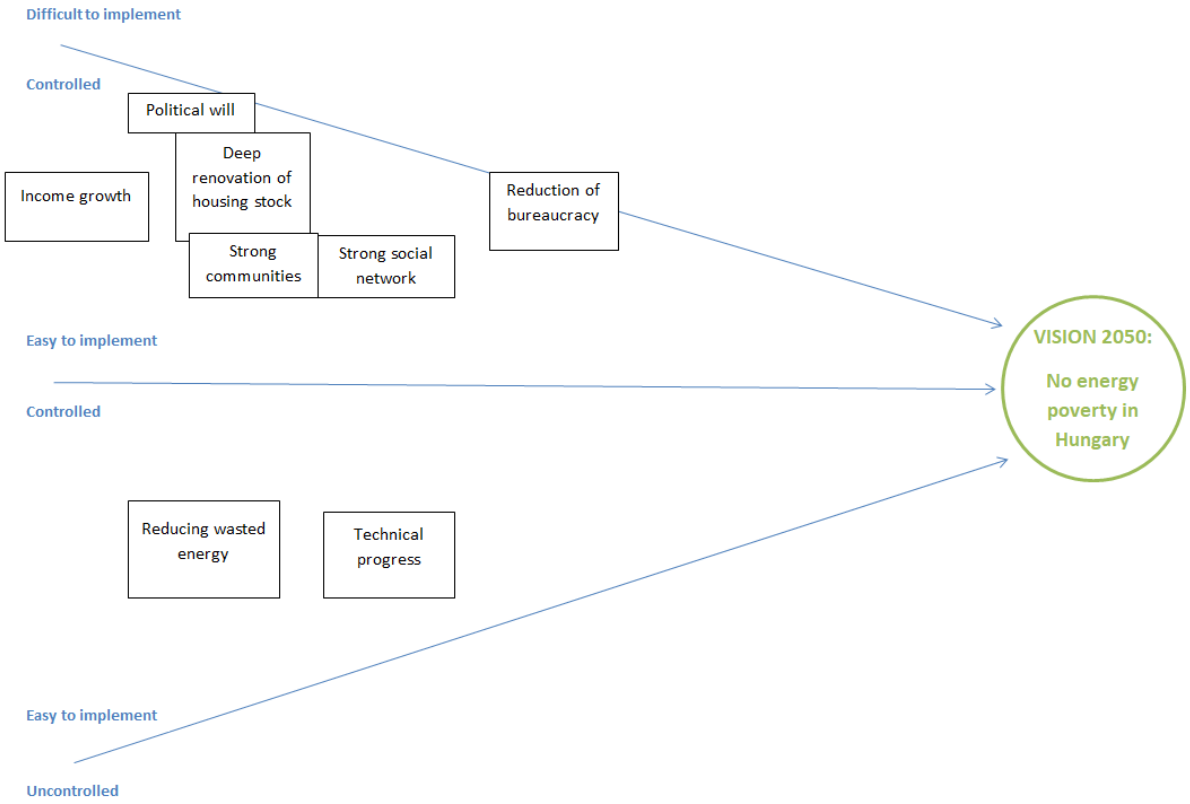
Reflecting to the Stakeholder universe graph, we created a model called Future radar. In the top cone, we have formulated a vision that energy poverty will be completely eradicated by 2050. The changes required for this achievement are ranked on the graph according to 2 variables: 1) how easy/difficult they are to realize? 2) do we have control over them, or do they happen randomly?

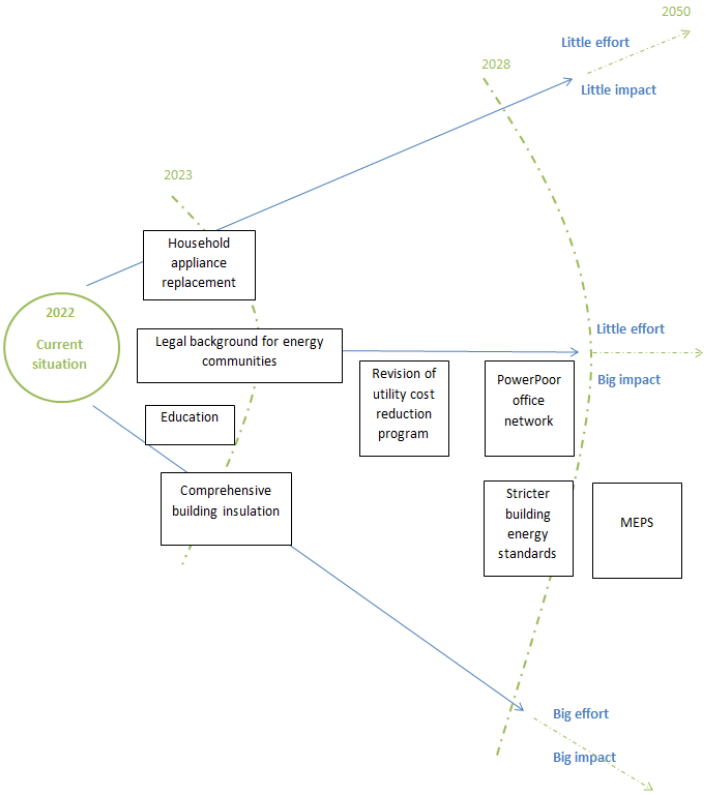
Top axis: controlled changes, but difficult to implement

Central axis: controlled changes and easy to implement (ideal)

Bottom axis: uncontrolled, but easily happening changes

Figure 24 Hungary Future Radar





The vision of the workshop attendees was to fully eliminate energy poverty by 2050.

The Liaison Group found the biggest challenge in changing the political will. Although it is a phenomenon fully controlled, we often face a lack of political interest in tackling energy poverty. This can be seen in the arrears in energy community support compared to other EU member states. No technical support, favorable regulatory environment and predictable financial incentives are available to spread their existence. The pace of increasing the energy efficiency of buildings by deep renovation is insignificant.

The urgently required change of the deep renovation of the housing stock is placed right next to the political intention in the future vision map. This is precisely one of the key problems of energy poverty, which can only be changed at the cost of greater investments. There are subsidies available for housing renovation, but they are not specifically linked to improving the energy efficiency of the buildings.

Closely related and equally difficult to achieve is the reduction of the bureaucracy. This requires political determination, which inevitably precedes, in chronological order, the ease of doing business.

Stepping a bit back on the chart timeline, high urgency was put on managed income growth. This would be an important step forward for energy-poor households, especially in settling energy bills. In the long term, however, it is also necessary to ensure proper

education and energy conservation so that they can manage their increased income properly.

The changes that are fairly easy to implement are seen as strengthening communities and social networks. We continue to emphasize the positive impact of energy communities. The Hungarian Association of Nature Conservationists defined 4 recommendations based on currently existing obstacles:

- Ensuring compliant legal definition,
- Developing of an integrated and targeted support policy,
- Creation of a non-profit energy agency,
- Promotion of energy sharing[42].

The reduction of wasted energy was placed halfway between managed and random changes. This can be uncontrolled and caused by force majeure, like high energy prices, as well as effectively managed through awareness raising, proper insulation of buildings and retrofitting of high energy consumers.

Technical progress also took its place among the moderately controllable changes.

The bottom cone shows the specific measures and their chronological order. The starting year on the graph is 2022-2023, the final year is 2045.

Stakeholders felt it was important to implement all measures as soon as possible, but a lot of post-its in one place would have made the graph difficult to read. Therefore, each small object in the graph refers to one post-it from the top axis line.

Top axis: measures that can be implemented with little effort but have negligible impact

Middle axis: low effort and effective measures (ideal)

Bottom axis: effort-intensive but effective measures

All policy recommendations seemed to be urgent and to be implemented by 2028.

Household appliance replacement would have a moderate impact, but it would also require relatively small effort to realize. This was placed along with a comprehensive building insulation program. As already emphasized in the previous parts, the deep renovation of housing stock would require the highest effort, but it would have the most significant positive impact to households living in energy poverty.

Creating a legal standard background for energy-communities seems to be the most effective policy implementation requiring minimal effort. This special recommendation

[42] https://mtvsz.hu/uploads/files/Megujuloenergia-kozossegek_Ertekelo_tanulmany_MTVSZ-SZGK-EMLA_final.pdf

forces a one-time activity of creating a legal definition and support mechanisms. However, promotion of energy communities requires thorough planning. It is a fair assumption that establishing an energy community on the most deprived locations of Hungary would be difficult and not sustainable. These regions burdened with deep poverty, lacking education and capital, require comprehensive social support mechanisms to tackle energy poverty.

Mainly households living in condominium apartments could benefit from establishing an energy community, although they are facing several obstacles. Experience shows difficulty in reaching common understanding even among socially better situated households. Currently even self-sustaining energy communities would need to pay grid usage fee and VAT (outstandingly high in Hungary – 27%). Both of these extra costs would need to be eliminated.

Education is definitely within the effective range of tools and it requires moderate effort. This is an ongoing activity and is performed mainly by civil society organizations through various projects.

The stakeholders found important to reform the utility cost reduction program by 2025. This policy aims to protect energy consumers by capping the energy prices, but on the long term it leads to waste and procrastination of building renovations. Only vulnerable households would need such support.

By 2028, stricter building energy standards should be implemented and the PowerPoor office network should be spread through the country. These would have high impact and relatively small effort provisions.

Although on the model it seems like all the interventions should take place in the next 5 years, take into consideration that some policies or projects might take several years to complete. The deep renovation of the buildings nationwide might take 20-30 years, but it certainly needs to start now. The stakeholders emphasized the importance of legal enhancements for energy-communities, which on the contrary to the building renovation, would take much less time and significantly less effort.

Key takeaways from the future radar models are:

- Deep housing stock renovation and household appliance replacement efforts need to continue on a higher pace nationwide
- Decision makers should encourage the establishment of energy communities by providing the accurate legal and technical support
- Bureaucracy needs to ease on the long term
- Positive changes in political attitude would enhance the fight against energy poverty

The following table lists the actions defined on the Future radar model with their implementation target date. Similarly to the stakeholder universe, a high emphasis was put on the legal support of energy communities. Along with that, the comprehensive building energy renovation is considered extremely important to start as soon as possible.

Energy poverty is a complex issue appearing in different forms and intensity. We need to distinguish whom are we targeting with the proposed actions, e.g. if we focused on the most deprived regions, education would be the foremost priority. We think actions listed below would benefit the households who are on the edge of energy poverty and it mainly depends on vis major events whether they are falling in.

Table 33 Hungary Actions

Policy Sector	**Actions to be implemented**	**By when?**	**By whom?**
Social policy	Creation of a legal background and supporting tools for energy communities	2023	Ministry of Interior Energy community promoters
Buildings	Comprehensive building energy renovation program including the replacement of large energy consumer appliances	start in 2023 and continue through 2040	Ministry of Energy
Education	Informative and education program related to energy efficiency	2023	Civil society organizations, NGO's, Ministry of Interior
Consumer protection	Reforming utility cost reduction program	2025	Ministry of Interior
Education	Nationwide spread of PowerPoor advice offices	2028	Civil society organizations
Legal	Tightening of building energy standards	2028	Ministry of Energy

For each of the co-identified action, an indicator is defined in this table. This enables progress monitoring at regular intervals specifically for the co-created actions

Table 34 Hungary Action-Specific Indicators

Indicator		Baseline (2022)	Target (date dependent on the action)
Creation of a legal background and supporting tools for energy communities		not available	existing statutory definition of energy communities, including their financial framework and support possibilities defined by law – by 2023
Increasing renewable community energy production capacity		currently not available or insignificant	26500 KWp[43]
Thermal insulation of buildings[44]	Family houses	33%	70% by 2040
	Block of flats	44%	97% by 2040
	Large apartment houses	26%	55% by 2040
	Small apartment houses	16%	33% by 2040
Awareness-raising campaigns targeting vulnerable households		~10 / year	16 / year as of 2023 and constantly increasing
Number of PowerPoor offices		2	15 by 2028

Phase 2

The policy recommendations formed in previous chapters were discussed with the members of the Hungarian Liaison Group. For each action a design plan has been created under the below section Action plans. The evaluation table tool will allow

[43] Magyarország helyreállítási és ellenállóképességi terve 2020, p.116

[44] MultiContact Consulting Kft., 2020

monitoring of the action plans and provide a basis for further collaboration with the Hungarian LG.

Step 4: Implement Actions and apply POWERPOOR Toolkit

Table 35 Hungary Action Elements

Creation of a legal background and supporting tools for energy communities	
The responsible entity and leading person	Ministry of Interior, energy community promoters and/or civil society organizations
The target group for the action	Households on the edge of energy poverty, vulnerable to the increase of energy prices, economic instability of the country, and vis major events
Action design	Creating statutory definition of energy communities and assign financial support resources. Energy community experts could be trained in the municipalities. A transparent and user friendly website/app could be designed where families willing to contribute to and energy community could register. The website would provide the legal frame, available expertise and could serve as a platform to connect the volunteers.
Scheduling	Legal frame and definition by 2023, In the following 2-3 years intensive promotion in the municipalities, capacity and expertise building, Website/app designed and available for users by 2025
Budget	The legislation frame is the responsibility of state administration and this goal is included in Hungary's Recovery and Resiliency Plan

	Promotion, capacity building and website could be project-based and delivered by energy community promoters and civil society organizations, estimated costs of such project is 170 000 - 350 000€
Drivers	energy supply diversification, increased resiliency towards energy price increases, community building
Barriers	no legal definition as a starting point, financial grants not assigned, lack of expertise and motivation of participants, especially in deprived areas

Increasing renewable energy capacity from energy communities	
The responsible entity and leading person	Municipalities, energy community promoters and/or civil society organizations
The target group for the action	Panel flats, settlements with sufficient conditions for solar energy production, municipalities
Action design	Building renewable energy community on the basis of volunteering and/or crowdfunding. Initiator should be the local municipality, PV specialist and electricians contributing with their expertise, residents contributing with volunteer work and/or own financial resources. Crowdfunding could be a form of financing
Scheduling	Hungary's Recovery and Resiliency Plan includes installation of 26 500 KWp renewable community energy production capacity by 2026 Q2[45]

[45] Magyarország Helyreálllítási és Ellenállóképességi Terve 2020, p. 116

Budget	over 280 million €[46]
Drivers	energy supply diversification, increased resiliency towards energy price increases, community building
Barriers	Detailed implementation plan is missing, lack of expertise and motivation of participants, not considering vulnerable households living in energy poverty

Thermal insulation of buildings	
The responsible entity and leading person	Ministry of Innovation and Technology
The target group for the action	Families living in old and poorly insulated houses, keeping a gradual approach and starting with the oldest and least energy effective buildings
Action design	Establishing a building renovation committee per each municipality and developing a net zero carbon legislation applicable for renovations. Mapping the oldest and least energy effective buildings in the municipality – using existing database and in-person visit questionnaire. Some buildings might not be worth of saving, therefore an alternative housing should be provided for those residents. One-stop-shop system for contractors and/or municipalities, who would coordinate the renovation end-to-end. It could also help in investment procurement. Possibility to subside 100% (or near) of the investments under certain conditions.

[46] Magyarország Helyreálllítási és Ellenállóképességi Terve 2020, p. 118

Scheduling	Start 2023 or as soon as possible, sustain by 2040 or longer
Budget	15 billion €
Drivers	Increased energy efficiency of buildings, therefore decreased energy intensity, decreased carbon emissions, decreased utility costs for households, better air quality and living standards, improved health conditions
Barriers	Subsidies not linked to energy efficiency improvements, lack of regulation that defines zero carbon emission after renovations, lack of prepared professionals and thorough planning

Awareness raising campaigns targeting vulnerable households	
The responsible entity and leading person	Civil society organizations, NGO's, Ministry of Interior
The target group for the action	Municipalities, deprived settlements, elderly
Action design	Distribution of flyers with energy efficiency advices, workshops and quizzes in schools and for elderly groups, video advertisement in TV channels, involving celebrities into awareness raising
Scheduling	2023 - increased number of campaigns compared to 2022
Budget	Depends on type of campaign
Drivers	Education as key tool for eradicating energy poverty, cost effective, no large investments needed
Barriers	Difficulty of changing long existing habits, lack of interest

Nationwide spread of PowerPoor offices	
The responsible entity and leading person	Civil society organizations
The target group for the action	Municipalities
Action design	Developing a sustainable and attractive model for Powerpoor offices. The consultancy provided could include comprehensive investment procurement advice. The Powerpoor offices should co-exist with the house renovation one-stop-shops (RenoHUB). Smaller settlements should also have own office to facilitate the access to residents – e.g. saving costs of traveling and better overview of local community. Opening hours on Saturday to reach more customers.
Scheduling	15 offices nationwide by 2028
Budget	240 000 €
Drivers	Providing advice to vulnerable households considering local conditions, awareness raising, cost efficiency
Barriers	Lack of public awareness, lack of municipality interest, sensitive topic, households not willing to admit their vulnerability, potential abuse of financial procurement help

Step 5: Monitor & Evaluate

Table 36 Hungary Action-Specific Indicators

Indicator		Baseline (2022)	Target (date dependent on actions)	Target achieved?
Creation of a legal background and supporting tools for energy communities		not available	existing statutory definition of energy communities, including their financial framework and support possibilities defined by law – by 2023	
Increasing renewable community energy production capacity		currently not available or insignificant	25000 KWp[47]	
Thermal insulation of buildings[48]	Family houses	33%	70% by 2040	
	Block of flats	44%	97% by 2040	
	Large apartment houses	26%	55% by 2040	
	Small apartment houses	16%	33% by 2040	
Awareness-raising campaigns targeting vulnerable households		~10 / year	16 / year	
Number of PowerPoor offices		2	15	

[47] Magyarország helyreállítási és ellenállóképességi terve 2020, p.116

[48] MultiContact Consulting Kft., 2020

Table 5 tracks the progress of general energy poverty indicators leaning on the categorization provided by EPAH. The target value and the date are based on the vision from the Future radar model, which was the complete eradication of energy poverty in Hungary. Some targets are very ambitious, especially the indicators related to the improvement of housing stock. We believe a robust renovation program in the near future, as described in the action plan, could help achieve these goals. In case of the poverty risk indicator we bear in mind the high complexity of this issue and it's often uncontrollable nature when setting the target value.

Table 37 Hungary General Energy Poverty Indicators

Indicator	Baseline (2022)	Target and Date (Vision)	Target achieved?
Inability to keep home adequately warm	5,4%	close to 0% by 2050	YES/NO (further details)
High share of energy expenditure in income	9%	close to 0% by 2050	YES/NO (further details)
Arrears on utility bills	9,7%	close to 0% by 2050	YES/NO (further details)
At Risk of Poverty or Social Exclusion	28,2%	8% by 2050	YES/NO (further details)
Population living in dwelling with presence of leak, damp and rot	20,4%	close to 0% by 2050	YES/NO (further details)
Dwellings with energy label A	10,7%	95% by 2050	YES/NO (further details)
Excess winter mortality/deaths	9,5%	close to 0% by 2050	YES/NO (further details)
Population living in dwellings comfortable warm in winter time	79,1%	close to 100% by 2050	YES/NO (further details)
Population living in dwellings comfortable cool in summer time	73,8%	close to 100% by 2050	YES/NO (further details)
Population living in dwellings equipped with heating facilities	99,9%	100% by 2050	YES/NO (further details)

Population living in dwellings equipped with air conditioning	3,8%	50% by 2050	YES/NO (further details)

Recommendations on how to implement the national roadmap

The above process will have resulted in a national roadmap which has been co-created with a diverse group of stakeholders from the POWERPOOR National Stakeholder Liaison Groups. Following the national policy dialogues and consultations, project partners reflected on the roadmap drafting process and suggested additional recommendations to specific stakeholder groups on HOW the above-listed actions can be implemented. Recommendations should be aimed at the following groups and be included below:

For Sub-National Governments

Map and assess the condition of the buildings in the municipality. Apply gradual approach and prioritize renovation of the least energy effective buildings. Establish a renovation steering committee consisting of electricians, building energy specialists and engineers.

Aim to promote and establish energy communities, taking into account local conditions.

Open local Powerpoor office with trained professionals considering local conditions. Opening hours should be adjusted to be available in after work hours or on Saturday to attract more customers.

Combine the Powerpoor office with RenoHUB one-stop-shop or other renovation consultancy service. Include possibility of comprehensive renovation coordination with investment procurement advice.

Raise awareness of energy efficiency. Spread flyers, hold awareness raising campaigns.

For National Governments

Continue establishing funds for building stock renovation. Create financial support mechanism strictly tied to energy efficiency related renovations.

Introduce net 0 or close carbon emission certificate requirements for building renovation.

Provide clear legislation for energy communities.

Reduce bureaucracy obstacles in public procurement and reduce administration efforts.

For Civil Society

Adjust energy consumption habits.

Participate in awareness raising campaigns.

Participate in establishing an energy community, if local conditions allow.

Seek for advice in Powerpoor and/or RenoHUB offices

For The Private Sector

Participate in awareness raising campaigns.

Install renewable energy production and promote its widespreading among vulnerable households.

Educate employees for energy efficiency.

Organize volunteering events for employees where they can help households living in energy poverty.

11. National Energy Poverty Mitigation Roadmap of Latvia

Introduction

In the POWERPOOR project, partners are actively assessing causes of energy poverty and suggest short-term and collective energy action solutions to mitigate this problem. A highly diverse network of Energy Supporters and Mentors has been trained and is being engaged to further support energy poor households to implement solutions. The project also sets up Local Energy Poverty Mitigation Offices in engaged municipalities. POWERPOOR strives to trigger high-impact change, not only on the local and regional level, but also on the national and European level. Such a multi-level governance approach will result in long-lasting impact and coordination between local needs and national (e.g. National Energy and Climate Plans) and supra-national enabling frameworks.

The aim of the national roadmaps is then to build on current project activities and to enable the application of the POWERPOOR approach to promote integrated energy poverty mitigation policies across all regions and cities within the pilot countries. This roadmap template is a synthesis exercise based on several outputs of the Work Packages and is to be used by project partners and Energy Supporters & Mentors during the last year of the project and beyond its lifetime (also possibly to be incorporated into future Horizon projects).

Next to the project national partners, stakeholders out of the network of Energy Supporters and Mentors, especially those at the National Liaison Groups, should be invited, to take ownership of the national roadmaps and take the process forward. This work will result in lessons-learned, which, in turn, generate policy recommendations on how the national regulatory / incentive framework should be adapted to mitigate energy poverty in the first place.

The key content defined in the national roadmaps will input the POWERPOOR exploitation plan as well as the POWERPOOR EU Policy Roadmap.

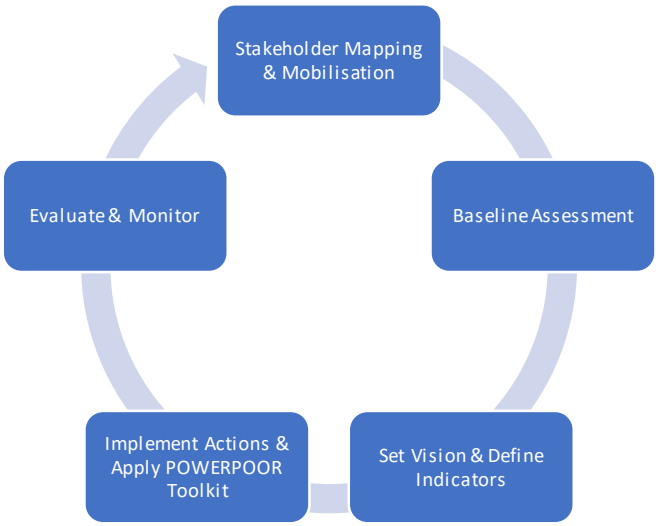
What is the methodology for the national roadmaps?

The development and adoption of the national roadmap is subdivided into two phases, which each encompasses specific steps on an integrated management cycle (adapted from ICLEI Green Climate Cities Programme). The cycle has been chosen as a basis for the roadmap since it promotes a holistic approach to policy making.

Phase 1 takes place until the end of the POWERPOOR project and includes steps which shall be carried out by partners and Energy Supporters and Mentors until then. Phase 2 takes place within one year after the project, or on any other timeline decided by the

partners and stakeholders. Once the cycle has been completed a first time, the process can be repeated (and could potentially serve as a basis for future projects).

Figure 25 Roadmap Methodology



Adapted from ICLEI Green Climate Cities Handbook 2016

National Roadmap Development

Phase 1

Step 1: Stakeholder Mapping, Commitment & Mobilization

In previously created D4.1 the stakeholders already have been categorised based on the level of necessity of involvement, their influence, expertise, and interest within a 0 to 5 scale (0 being the lowest and 5 the highest). For Latvia, the stakeholders' value (necessity of involvement) is indicated to be rather high with many of the stakeholders (86%) ranked 5. Similarly, the stakeholders' power is rather high as 86% is ranked with 5. As for the level of interest of the stakeholders, it is observed that the majority of them (57%) is ranked with 4 and 43% of them is ranked with 5. Similarly, for their level of expertise, 57% of the stakeholders are ranked with 4 and 43% of them are ranked with 5.

Stakeholders' universe

In the mapped Stakeholder Universe, the stakeholders with the closest working relation and connections are placed side to side with each other. Social departments of municipalities, municipal utilities companies and senior unions are positioned at the highest interest in alleviating energy poverty and also side by side as they have the closest working relation. Additional partnership connections are drawn in the form of

dotted lines and the partnerships are described in the paragraphs below.

Jekabpils Senior union ”Sasaiste” is highly affected by energy poverty and the members are vulnerable to a great extent, the union is highly adaptable and works in close relation with social department of Jekabpils county in order to alleviate the energy poverty. Bond with social department of Jekabpils county provides mutual benefit and feedback loop for both parties on the implementation of the energy poverty mitigation schemes.

Social departments of the Jelgava city, Jekabpils county and Dobele county work under the same national network. Information and best practices on energy poverty mitigation is shared between them. They are not highly adaptable as their operation is governed by Social Services and Assistance Law and the related regulations, meanwhile they are able to influence things locally at municipal level.

Municipal utility companies are also interested in the mitigation of energy poverty as the energy poor households typically have issues with paying energy bills on time thus creating an unpredictable cash flow for the companies. Social aspect of the issue motivates the municipal utility companies to eliminate the energy poverty but it is not their main goal so they are not that adaptable in regards of energy poverty.

Red cross Jelgava is highly interested in alleviating energy poverty as the reduced poverty is one of their direct objectives and it would improve overall local economic situation. Red cross Jelgava is highly adaptable.

Development division of Dobele county is highly adaptable as far as implementation of development projects allows for it. Development division recently, as one of their directions, has been focusing also on energy poverty mitigation projects and solutions as a priority, bearing in mind the high energy prices.

Jelgava Municipal Real Estate Management (JNIP) aspires to alleviate the energy poverty with social and economic factors in mind. Also, close relation with Jelgava city municipality and Jelgava social affairs department is maintained.

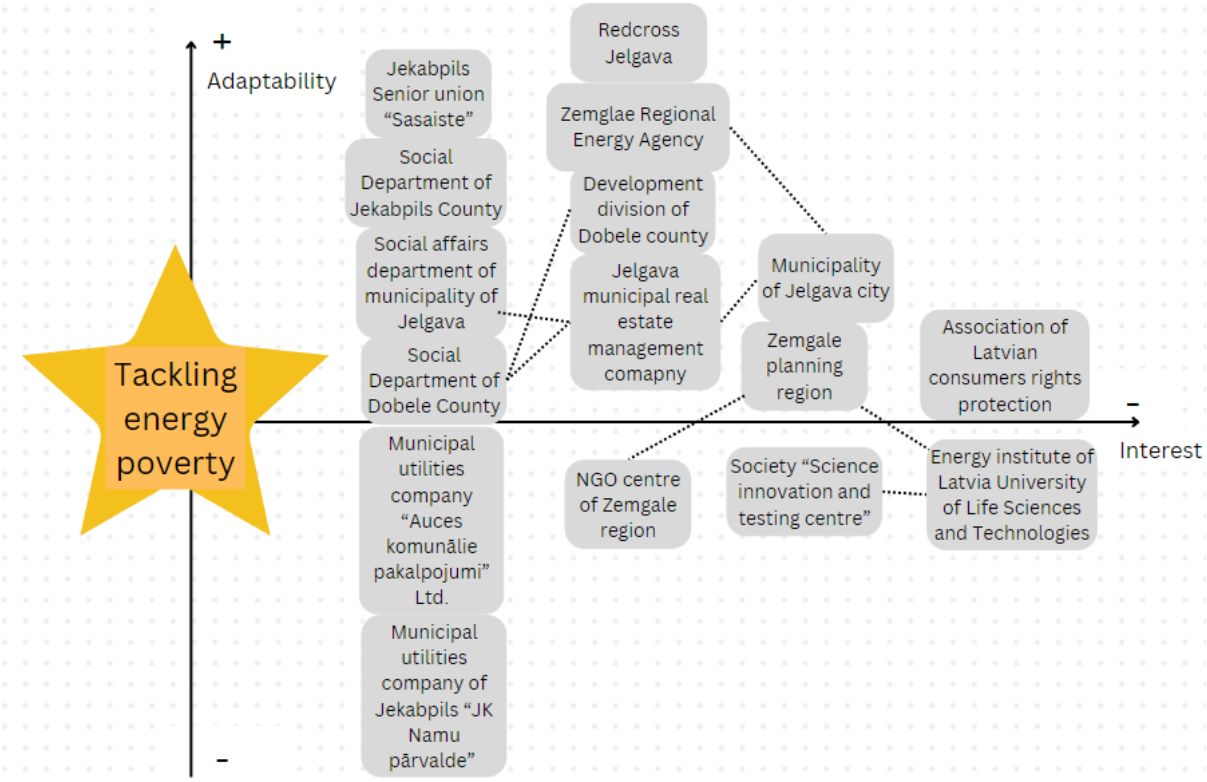
NGO centre of Zemgale region is assisting multiple NGOs in Jelgava that are dealing with wide range of issues including energy poverty and society development in general. They are assisting in mitigation of energy poverty beyond the POWERPOOR stakeholder group in Latvia.

Municipality of Jelgava city has a close working relation with Zemgale Regional Energy Agency (ZREA) and Municipal Real Estate Management (JNIP) company by coordinating priorities, achievable goals and managing resources.

Zemgale Planning Region has suggested collaboration with Energy institute of Latvia University of Life Sciences and Technologies and Society “Science innovation and testing centre” to perform potential science based researches in regards to energy efficiency to improve the energy poverty situation in the region.

Association of Latvian Consumers Rights Protection works on mitigation of energy poverty with stakeholders beyond the Latvia POWERPOOR stakeholder group.

Figure 26 Latvia Stakeholder Universe



Stakeholders at Latvia national level:

- Ministry of Welfare
- Ministry of Economics
- Ministry of Environment Protection and Regional Development
- Municipalities
- Social departments of municipalities
- State social insurance offices
- Contracting authority of energy efficiency programmes – Altum
- Planning regions of Latvia

At the outset of POWERPOOR project ZREA invited 10 different organizations to delegate participants for the Liaison group, 13 persons were delegated, 11 of them signed and submitted the consent forms. The first Liaison Group meeting was held in February 2021 virtually due to Covid-19 restrictions. The further Liaison group meetings have been held in the project course on regular basis in October 2021, in October 2022 etc. Liaison group

members have provided advice, commented and improved the implementation of POWERPOOR in terms of the selection of energy mentors and supporters, their training, they have provided their input for the National Roadmap on mitigation of energy poverty in Latvia, and have been involved as the active stakeholders of the stakeholders' universe.

Table 38 Latvia Liaison Group Members

Organisation	Target Group	Number of Representatives
Municipal utilities company (heat and water supply, house maintenance) of Auce municipality - "Auces komunalie pakalpojumi", Ltd.	Housing provider	1
Association of Latvian consumers rights` protection	Civil Society	1
Social affairs department of municipality of Jelgava city	Local Authority	1
Development division of Auce county municipality	Local Authority	1
Society "Development forum of technologies"	Civil Society	1
Energy institute of Technical faculty of University of Life Sciences and technology	Academia	3
Zemgale planning region administration	Regional Authority	1
Administration of Jelgava city municipality	Local Authority	1
Society "NGO support center of Zemgale region"	Civil Society	1
Municipal utilities company (house maintenance) of Jekabpils municipality – "JK Namu parvalde", Ltd.	Housing provider	1
Jekabpils senior citizens association "Sasaiste"	Social care	1

Step 2: Baseline Assessment

In Latvia, on 16/02/2021 an amendment in the Energy Law was adopted-the definition of energy poverty was included in the law, also criteria for households to be considered energy poor were included in the law. It is determined in the law that government institutions in their policy planning process and documents will take into account the number of energy poor households, they must be considered as priority in the energy

efficiency policy measures. According to the Central Statistical Bureau (CSB) survey, 22% of Latvia's population were at risk of poverty in 2016. Only one policy - National Energy and Climate Plan 2030 (NECP2030) addresses energy poverty with measures of reducing energy poverty and ensuring a fair transition. The targets have been set: to reduce the proportion of households which lack heat in their housing (7.5% in 2018) to be less than 7.5%[49] and to increase the number of electricity consumers receiving special service as the protected user (lower tariff of electricity) to 160,000 instead of current 80,000. Also, one of the criteria in energy efficiency improvement measures of buildings is reduction of energy poverty.

In order to determine whether a household is affected by energy poverty, the family's (person's) income level is evaluated but compliance with the status of a poor or low-income family (person) is used as a main criterion to determine if the household is energy poor. At the same time, this family (person) can receive an apartment benefit or the status of a social housing resident. According to the data provided by the Ministry of Welfare, in January 2020, 26,374 poor persons, or 1.38% of the total population in Latvia, were registered in Latvian municipalities. According to the data of the Ministry of Welfare, in January 2020, 39,198 low-income persons, or 2.05% of all residents in Latvia, were registered in Latvian municipalities. The law includes a requirement that the state or local government should implement energy efficiency policy measures as a priority in households affected by energy poverty. [50]

Table 39 Latvia Baseline Assessment Revision

	Short description	Existing targets/description
National Energy and Climate Plans (NECPs)	Policy planning document setting out Latvia's objectives and performance measures: - reductions in greenhouse gas emissions (GHG),-increase in the share of renewable energy sources (RES),-reductions in	The 2030 target for the indicator "the proportion of households that could not afford providing heat in housing" is to ensure that this rate will be less than 7.5% in Latvia. The services of the protected user (electricity consumers) are received by all those

[49] https://likumi.lv/ta/id/312423-par-latvijas-nacionalo-energetikas-un-klimata-planu-20212030-gadam

[50] (https://lvportals.lv/skaidrojumi/324899-define-kas-ir-energetiska-nabadziba-2021)

	energy use and improvements in energy efficiency,-ensuring energy security and reducing energy dependency,-maintaining and improving the infrastructure of energy markets,-reducing energy poverty and ensuring a fair transition,-improving innovation, research and competitiveness.	who are entitled to it (160 000 instead of 80 000) and targeted measures are being taken to substantially reduce energy poverty.
The building sector - renovation efforts	1) In accordance to the European Parliament and the Council Directive No. 2012/27/ES (of 25/10/2012) the Member State should develop a long-term strategy for buildings to mobilize investments in both public and private residential buildings and commercial areas 2) National programme for improvement of energy efficiency in multi residential buildings, part of it financed from EU funds amounting to €166 million is available to Latvian citizens in the energy efficiency programme till 31 December 2023 (closed on 18/12/2020). 3) On 11/02/2021 the Cabinet of Ministers approved a new support programme designed to renovate a single-apartment residential houses and improve energy efficiency. State-owned development finance institution ALTUM works on how the new aid programme will be implemented. Currently the	1) The current energy performance targets for buildings are: - the availability of financing for economically justified projects throughout the territory of Latvia, including regions; -quality project management and supervision; - focusing on activity monitoring for achieving results, including energy savings; - the achievement of high energy efficiency and high-quality construction; -improvement of the procedures for the selection of the construction company; - reduction of resources' costs. 2) After refurbishment measures, energy consumption should decrease (less than 90 kwh/m2). Grant 50% of the eligible costs of the project. If necessary, a guarantee of up to 80% of the loan in the credit institution and loan. 3) Guarantee: if additional collateral is required for a bank loan, up to 30% of the loan amount, up to EUR 20000; Technical support for project technical documentation up to EUR 1000; Grant: One-off payment for increasing the energy efficiency

	support programme is open and applications can be submitted.	class of a private house and reducing the energy consumption by 20%, up to EUR 5000.
Social care	During the rapid energy price increase in Latvia starting from 2021, Cabinet of Ministers passed a law defining support to all households that would relieve the financial burden.	Currently, at the end of 2022 such support is available[51]: • One-time 60 EUR grant for firewood purchase or 50% compensation of cost increase per cubic meter purchased over price of 40 EUR/m^3 • For pellets and briquettes 50% compensation of cost increase per ton that is purchased over price of 300 EUR/ton, support not exceeding 100 EUR/ton. • The state will compensate 50% of the electricity price that exceeds 0.160 EUR/kWh, but no more than 100 EUR/MWh. Any household will have to pay for the first 500 kWh consumed according to the electricity price set by the electricity trader, but the consumption exceeding this threshold will be compensated. • All households will be compensated for the increase in the price of electricity - a fixed fee of 160 euros/MWh will be applied to all households for the first 100 kWh every month and the state will compensate the remaining difference to the market price.
Policy to promote community-	Changes in Energy Law and changes in Electricity Trade Law defining energy communities	In development. Law defining energy communities is in force since July 2022, but regulations of Cabinet of

[51] https://www.em.gov.lv/lv/valsts-atbalsts-20222023-apkures-sezona

ownership of energy	adopted in July 2022, regulations of Cabinet of Ministers expected in 2022-2023.	Ministers are yet to be developed and published by February, 2023.
Policy to promote (collective) finance / crowdfunding	POWERPOOR	The information on crowdfunding has been provided in the training for POWERPOOR supporters and mentors. This practice in Latvia is not widespread yet.
Consumer protection	The electricity market law states that protected users, i.e. poor or disadvantaged families (persons), multi-child families or families (persons), in the care of which there is a child with disabilities, are entitled to receive the support in paying electricity bills as supported user.	Protected users receive following monthly support in paying electricity bills[52]: • for a poor or low-income household (person) – 5 euros; • for a family (person) who cares for a child with a disability, – 5 euros; • for a person with disability group I or their guardian - 5 euros; • for a family with many children – 10 euros.
SECAPs	Jelgava city SECAP	Measures targeting energy poverty: 1. Increasing the energy efficiency of residential buildings. 2. Promotion of energy self-generation for self-consumption. 3. Energy poverty mitigation. 4. Encouraging consumers to control their energy consumption and costs through smart meters. 5. Informative events on energy saving and increase of energy efficiency, information on daily energy consumption habits/use of energy equipment.

[52] https://likumi.lv/ta/id/323662-aizsargata-lietotaja-tirdzniecibas-pakalpojuma-noteikumi

	Jekabpils county SECAP	Measures targeting energy poverty: 1.Encourage the creation of pre-conditions to enable citizens to produce electricity for their own consumption using double side metering with the grid. 2.Increase of energy efficiency of multi-residential buildings. 3. Promotion of energy self-generation for self-consumption. 4. Energy poverty mitigation.
	Auce/Dobele SECAP	Measures targeting energy poverty: 1. Promotion of energy efficiency measures in multi residential buildings. 2. Information on energy bills about energy efficiency measures, about possibilities to reduce energy consumption. 3. Informative events on energy efficiency.

In POWERPOOR project using the Energy Poverty Guidebook for Energy Planning ZREA provides technical support to formulate the additional set of actions in SECAPs for mitigating energy poverty.

The following list of energy poverty mitigation actions has been proposed for the pilot municipalities and are in the process of inclusion:

- Adopting POWERPOOR tools for identifying energy poor citizens;
- Use of POWERPOOR tools - POWERTARGET, POWERACT, POWERFUND in tackling energy poverty;
- Tool for monitoring households' energy consumption to be used for providing individual assistance to save energy and to define public policies;
- Workshops for energy poor citizens informing them about energy saving measures and financing schemes supporting improvement;
- Supporting the preparation of project documentation for the renovation of apartment buildings;
- Support to household owners to pay the larger up-front costs of Renewable Energy installations and/or Energy Efficiency investments;

- Encouraging the use of energy poverty mitigation office;
- Distribution of information/educational material on behavioural changes, energy carrier selection, or more substantial such as building renovation, upgrading of heating system etc.;
- Facilitation of joint energy initiatives, assistance in the formation and promotion of renewable energy communities (Join a community, create a community, operate a community);
- Technical-legal and economic advice;
- Education and dissemination of information about energy efficiency and energy poverty in the general public.

It is planned that part of the proposed actions on mitigating energy poverty will be included in the following SECAPs:

- SECAP of Jelgava city 2021 – 2030, actions added as annex.
- SECAP of Jekabpils city 2021 – 2030 actions added as annex.
- Prepared proposals for SECAP of Dobele county 2022 – 2030.

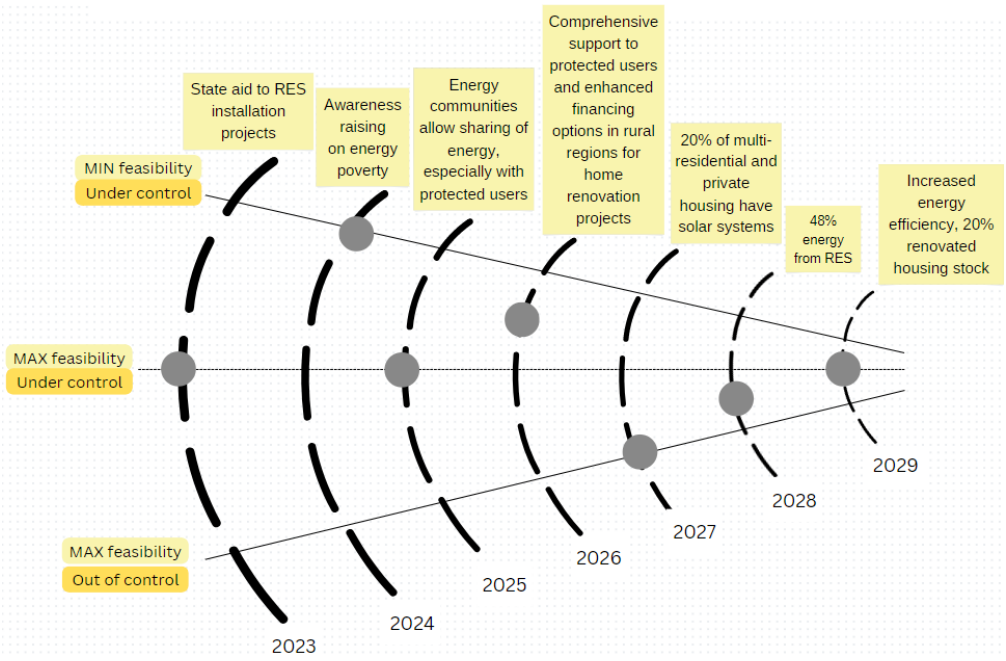
Step 3: Set Vision, envision Actions and define Indicators

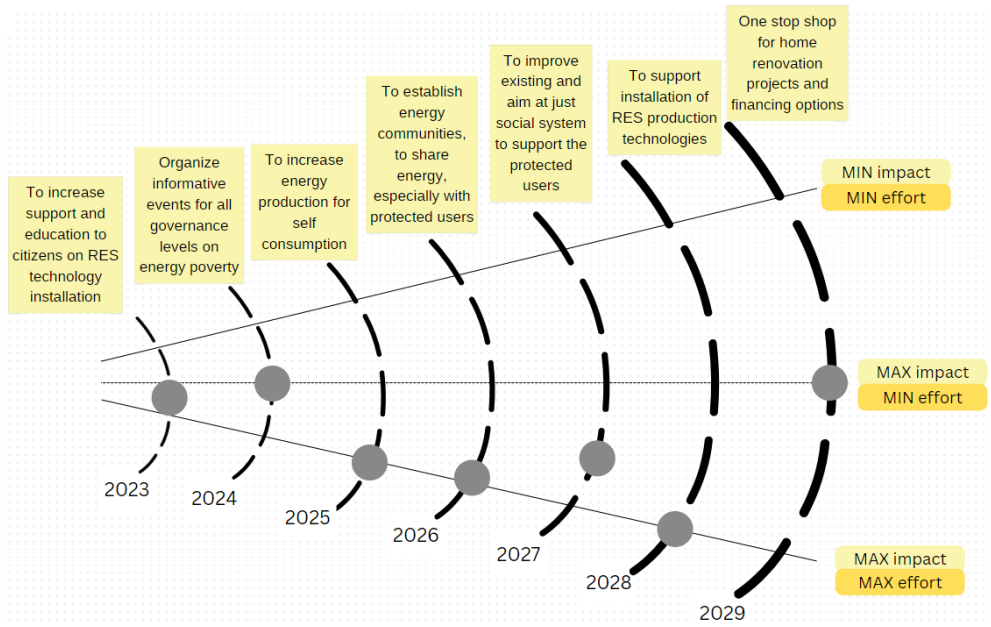
The energy poverty is a complex issue to tackle. Although fast paced changes and actions are desirable, the magnitude of affected sides is voluminous and it is a multi-angled issue which cannot be resolved fast, easily nor cheaply. To fight the energy poverty a multilevel approach must be used that implements vertical, top to bottom integration approach. In Latvia energy poverty is a recently defined term and currently the official definition of energy poor citizens include only those who have received a status of a protected person and receives governmental support to reduce the household's poverty. In this sense, the POWERPOOR approach (with 10% threshold) is more comprehensive because the households which have not received the status of a poor household yet their energy expenditure is high.

The vision for the 2029 is to reduce the energy poverty in Latvia to 1% as well as reduce number households who are at risk of poverty to 5% (26% in 2020)[53].

[53] https://energy-poverty.ec.europa.eu/observing-energy-poverty/national-indicators_en

Figure 27 Latvia Future Radar





Time scale has been developed and actions suggested by one-year steps. It should be taken in consideration that most of the actions and changes should happen simultaneously but realistically considering the available resources at a state level, the chosen action implementing pace is feasible.

Firstly, general society has to be informed and awareness needs to be raised on the energy poverty issues and possible solutions. The society needs to be educated on RES technology installation potential to kickstart the reduction of energy dependency. This

would include financial incentives and other support to the ones who are already ready to become prosumers by installing solar photovoltaic systems, for example, or other RES technologies. This action would be investment intensive, require medium effort and provide maximum impact on alleviating energy poverty.

The following activity would include education on all governance levels on energy poverty. This would include informative events which would deliver a great impact with medium effort. At all governance levels information would have to be passed down to general public via different channels (social departments, municipal educational campaigns, etc.).

Increase of energy production for self-consumption would facilitate greater independence from external providers and would enable citizens be more independent from energy price fluctuations.

Following previous targeted actions should be taken to encourage citizens to participate in energy communities which would require a huge effort. This would include financial support programmes to activate citizens to participate in an energy community, especially the category of protected users would have to be targeted as their financial capability to participate in energy community could be limited.

Also dedicated actions on state level should be taken to improve the existing social support system generally to support the protected citizens.

As the next step, to reach higher percentage produced from RES, support on RES technology installation would have to be provided, thus establishing energy self-sufficiency at greater extent. This would require bigger investment effort but the impact would be significant.

To reach energy efficiency targets, one-stop-shops with united approach, covering all areas of expertise on energy efficiency measures would have to be provided and further developed. Bearing in mind already existing state development finance institution ALTUM which is contracting authority in implementing housing stock energy efficiency programmes and projects, and provides consultations in most cities of Latvia, this action would require minimum effort and have maximum impact.

Society needs to be educated on issue of the energy poverty. All the actions need to be implemented as soon as possible to achieve the outlined necessary changes and they ought to be done simultaneously. The active and well informed part of the society is already taking steps and applying to state provided support to achieve energy self-sufficiency, the more passive part of the society though, which in most cases are under energy poverty risk, would need more support. Energy poverty is a complex issue that requires a great effort with feasible actions that need to be delivered in a strategic way.

Table 40 Latvia Actions

Policy Sector	Actions to be implemented	By when?	By whom?
Energy/ buildings	To increase energy production for self-consumption	2025	Ministry of Environmental Protection and Regional Development
Social care	Organize informative events for all governance levels on energy poverty	2024	Ministry of Welfare
Energy market	To establish energy communities, to share energy, especially with protected users, 2% of the population engaged in energy communities for energy sharing.	2026	Ministry of Energy and Climate
Social care	To improve existing and aim at just social system to support the protected users	2027	Ministry of Welfare
Environmental Protection and Regional Development	To increase support and education to citizens on RES technology installation	2023	Ministry of Environmental Protection and Regional Development
Energy/ buildings	To support installation of RES production technologies	2028	Ministry of Environmental Protection and Regional Development

Buildings	One stop shops for house renovation projects and financing options	2029	State development financial institution Altum

Energy poverty is a matter that cannot be determined easily by one indicator. EU Energy Poverty Observatory (EPOV) has defined the four most influential indicators that can measure and determine the level of energy poverty. The indicators are:

Arrears on utility bills

Share of (sub)population having arrears on utility bills, based on question "In the last twelve months, has the household been in arrears, i.e. has been unable to pay on time due to financial difficulties for utility bills (heating, electricity, gas, water, etc.) for the main dwelling?" [54]

Low absolute energy expenditure (M/2)

The M/2 indicator presents the share of households whose absolute energy expenditure is below half the national median, or in other words abnormally low. This could be due to high energy efficiency standards, but may also be indicative of households dangerously under-consuming energy. M/2 is a relatively new indicator that has been used in Belgium to complement other expenditure and self-reported indicators. Note: this indicator is influenced by the underlying distribution of absolute energy expenses in the lower half of households. If the median is relatively high and the distribution below very unequal, the M/2 indicator is high. [55]

High share of energy expenditure in income (2M)

The 2M indicator presents the proportion of households whose share of energy expenditure in income is more than twice the national median share. Note: where income distributions are more equal, variance in energy expenditure translates to higher 2M shares. High variance in energy/income shares can occur due to structural differences in energy expenditure between household groups, as well as in situations where energy is often, but not exclusively, included in rent. [56]

Inability to keep home adequately warm

Share of (sub)population not able to keep their home adequately warm, based on question. [57]

[54] Arrears on utility bills https://indicator.energypoverty.eu/

[55] Low absolute energy expenditure (M/2) https://indicator.energypoverty.eu/indicator?primaryId=1463

[56] High share of energy expenditure in income (2M) https://indicator.energypoverty.eu/indicator?primaryId=1460

[57] Inability to keep home adequately warm https://indicator.energypoverty.eu/indicator?primaryId=1461&type=bar&from=2019&to=2019&countries=LV

Table 41 Latvia Action-Specific Indicators

Indicator	Baseline (2022)	Target by (date dependant on action)
Number of support programmes to support RES installation	2 (2022)	5 (2023)
Number of informative events on energy poverty	6 (2022)	10 (2024)
At Risk of Poverty or Social Exclusion	26 % (2020) [58]	5% (2026)
Number of households producing energy for self-consumption	10000 Households [59]	40000 households (2025)
Number of established energy communities	1 (2022)	10 (2026)
One stop shop for home renovation projects and financing options	Currently one shop in most of the cities (2022)	Increased human resources and capacity to consult citizens per shop
Household electricity prices	0,16 EUR / kWh (2021) [60]	0,10 EUR / kWh (2025)
Renovated multi-residential buildings	10% (2022)[61]	20% (2029)
Share of renewable energy (RES) in final energy consumption (%)	39.01 % (2020) [62]	48% (2028)

[58] https://energy-poverty.ec.europa.eu/observing-energy-poverty/national-indicators_en

[59] https://buvinzenierusavieniba.lv/sadales-tikla-pieslegto-mikrogeneratoru-skaits-sasniedzis-10-000/

[60] https://energy-poverty.ec.europa.eu/observing-energy-poverty/national-indicators_en

[61] https://www.lsm.lv/raksts/zinas/ekonomika/zaudetais-siltums-latvija-nosiltinatas-tikai-ap-10-daudzdzivoklu-maju.a452018/

[62] https://www.em.gov.lv/lv/aer-energija

Phase 2

Detailed overview and description of the chosen actions by Stakeholder Liaison Group can be found in the tables below.

Table 42 Latvia Action Elements

To increase support and education to citizens on RES technology installation	
The responsible entity and leading person	Energy and Climate ministry
The target group for the action	Citizens Citizens who are at high risk of energy poverty
Action design	Develop a state-run campaign to clear the myths about RES technologies, especially solar systems and benefits of installing RES technologies. After successful campaign create educational courses for citizens on solar PV and other RES technologies.
Scheduling	2023
Budget	3M
Drivers	Necessity to transition to RES technologies
Barriers	Citizen interest and ability to deliver the information efficiently

Organize informative events for all governance levels on energy poverty	
The responsible entity and leading person	Ministry of Environmental Protection and Regional Development, Ministry of Economics, Ministry of Climate and Energy
The target group for the action	State, regional and municipality specialists which can influence reduction of energy poverty

Action design	Organize informative events at all levels of governance that would educate specialists on how to define and tackle energy poverty.
Scheduling	2024
Budget	0.7M
Drivers	The need to raise awareness of the issue
Barriers	Low level of specialist involvement and taking interest

To increase energy production for self-consumption	
The responsible entity and leading person	Ministry of Environmental Protection and Regional Development
The target group for the action	Owners of single private houses and multi residential houses
Action design	Multi-staged governmental support programmes that support RES technology installation both for single private and multi-residential house owners to become energy self-sufficient – prosumers.
Scheduling	2025
Budget	23M
Drivers	Necessity to become energy self-sufficient, market instability of imported energy sources, such as gas.
Barriers	Expensive prices of solar and wind systems.

To establish energy communities for energy sharing, especially with protected users

The responsible entity and leading person	Ministry of Economics
The target group for the action	All citizens, citizens under risk of energy poverty
Action design	National level support schemes that would support creation of energy communities and especially support the energy poor citizens in obtaining access to renewable and cheap energy.
Scheduling	2026
Budget	6M
Drivers	Rising energy prices
Barriers	Lack of regulation on energy communities and low-income level of large part of multi-residential building apartment owners, which limits them to invest in solar systems for sharing.

To improve existing and aim at just social system to support the protected users	
The responsible entity and leading person	Ministry of Welfare of the Republic of Latvia
The target group for the action	Citizens who are at high risk of energy poverty
Action design	Defining direct and effective actions at national and municipality level to reduce the overall poverty thus alleviating energy poverty. Greater support to protected users, tax reductions, also creation of municipal social energy communities.
Scheduling	2027
Budget	2M
Drivers	Enhancing of economic equality among citizens

Barriers	Restricted budget

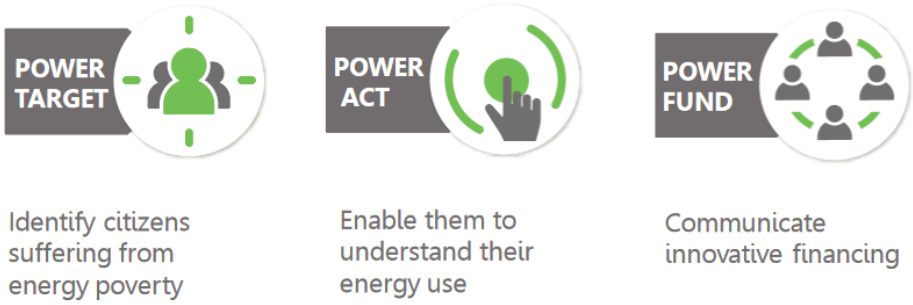
To support installation of RES production technologies	
The responsible entity and leading person	Ministry of Environmental Protection and Regional Development, Ministry of Economics
The target group for the action	Citizens, Citizens who are at high risk of energy poverty
Action design	Financial and advisory support to households for installation of RES technologies to motivate citizens to become prosumers.
Scheduling	2028
Budget	40M
Drivers	Zero emission goals by 2050 and necessity to become energy self-sufficient
Barriers	Restricted budget

One stop shop for home renovation projects and financing options	
The responsible entity and leading person	Ministry of Economics
The target group for the action	Citizens - home/apartment owners, Citizens who are at high risk of energy poverty
Action design	Further develop one stop shops for citizens to have an easy access to information and service providers, also redefine requirements to relieve the bureaucracy.
Scheduling	2029

Budget	2M
Drivers	Post-soviet housing stock that is highly deteriorated and energy inefficient
Barriers	Citizens -apartment owners' having insufficient financial means to invest in their housing

The POWERPOOR toolkit is incremental to the implementation of the individual actions and should be used actively by whichever stakeholder (e.g. municipality or POWERPOOR partner) has been identified, in the previous steps, as being responsible for implementation.

Figure 28 POWERPOOR Toolkit



Step 5: Monitor & Evaluate

Table 43 Latvia Action-Specific Indicators

Indicator	Baseline (2022)	Target(date depended on action))	Target achieved?
Number of support programmes to support RES installation	2 (2022)	5 (2023)	
Number of informative events on energy poverty	6 (2022)	10 (2024)	

At Risk of Poverty or Social Exclusion	26 % (2020)	5% (2026)	
Number of households producing energy for self-consumption	10000 Households [63]	40000 households (2025)	
Number of established energy communities	1 (2022)	10 (2026)	
One stop shop for home renovation projects and financing options	Currently one shop per city (2022)	Increase human resources and capacity to consult citizens per shop (2029)	
Average household electricity prices	0,16 EUR / kWh (2021)	0,10 EUR / kWh (2025)	
Renovated multi-residential buildings	10% (2022)64	20% (2029)	

This table tracks the progress of general energy poverty indicators leaning on the categorization provided by EPAH.

Table 44 Latvia General Energy Poverty Indicators

Indicator	Baseline	Target and Date (Vision)	Target achieved?
Inability to keep home adequately warm	4,9 % (2021)	3% by 2029	YES/NO (further details)
High share of energy expenditure in income	12,7% (2015)	4% by 2029	YES/NO (further details)
Arrears on utility bills	5,8 % (2021)	3% by 2029	YES/NO (further details)
Low absolute energy expenditure	10,7% (2015)	3.5% by 2029	YES/NO (further details)

[63] https://buvinzenierusavieniba.lv/sadales-tikla-pieslegto-mikrogeneratoru-skaits-sasniedzis-10-000/

[64] https://www.lsm.lv/raksts/zinas/ekonomika/zaudetais-siltums-latvija-nosiltinatas-tikai-ap-10-daudzdzivoklu-maju.a452018/

Baseline year on different indicators is inconsistent because of lack of statistical data, the most recent year with available data is taken as a baseline.

Recommendations on how to implement the national roadmap

For Sub-National Governments (municipalities)

Check ideas of National Roadmap on energy poverty mitigation actions developed by POWERPOOR project. [65] During the Roadmap creation process a wide range of specialists from different related fields have been involved and their opinions gathered on how to alleviate the energy poverty.

Contact the local energy poverty mitigation office for assistance. In the office it is possible to consult with an energy poverty mitigation specialist, gain access to more detailed information and get tailored tips for different measures.

Use the POWERPOOR toolkit. For example, the POWERTARGET tool can be used to identify the energy poverty level of a household, POWERACT can be used to suggest the household how to reduce the energy bills and POWERFUND can be used to disseminate information on energy communities.

For National Governments

Check ideas of National Roadmap on energy poverty mitigation actions developed by POWERPOOR project. [66] During the Roadmap creation process a wide range of specialists from different related fields have been involved and their opinions gathered on how to alleviate the energy poverty.

Use the best practices on how to alleviate the energy poverty on the Energy Poverty Advisory Hub (EPAH). [67] The information has been gathered through extensive research on topic of energy poverty throughout the Europe.

For Civil Society

Visit the local energy poverty mitigation office. In the office it is possible to consult with an energy efficiency and poverty mitigation specialist, gain access to more detailed information and get tailored tips for different measures.

Apply for the POWERPOOR home visit. This will provide the applicant with detailed consultation on heating system, energy efficiency of the building, energy efficiency of the appliances, energy habits, analysis of energy bills, energy communities and related

[65] https://powerpoor.eu/
[66] https://powerpoor.eu/
[67] https://energy-poverty.ec.europa.eu/index_en

topics in order to reduce the energy poverty in the household which is receiving the consultation.

Attendance of informative events on the topic of energy poverty. This is a great way to gain access to useful information, hear and express issues.

Attendance of informative events on community energy. In addition to useful information gained, citizens will be able to network and discuss potential of energy communities. For existing energy communities it will be a possibility to attract new members.

Energy generation for self-consumption. Becoming a prosumer reduces the energy that needs to be bought for ever-changing tariffs and stabilizes the income-expenditure ratio.

Creating/joining citizen joint initiatives on joint energy production.

For The Private Sector

Energy generation for self – consumption. This would provide self-sufficiency, predictability of energy costs and pay off in the long term.

Electromobility combined with energy self-generation. Further reduces the energy costs, especially in transportation intensive enterprises.

Use of waste heat. Recycling of energy reduces carbon foot print and reduces energy costs.

Energy efficiency in processes and buildings. Outsource or create a division that works especially on energy efficiency solutions in order to reduce overall energy expenditure.

12. National Energy Poverty Mitigation Roadmap of Portugal

Introduction

Why set a national energy poverty mitigation roadmap?

In the POWERPOOR project, partners are actively assessing causes of energy poverty and suggest short-term and collective energy action solutions to mitigate this problem. A highly diverse network of Energy Supporters and Mentors has been trained and is being engaged to further support energy poor households to implement solutions. The project also sets up Local Energy Poverty Mitigation Offices in engaged municipalities. POWERPOOR strives to trigger high-impact change, not only on the local and regional level, but also on the national and European level. Such a multi-level governance approach will result in long-lasting impact and coordination between local needs and national (e.g. National Energy and Climate Plans) and supra-national enabling frameworks.

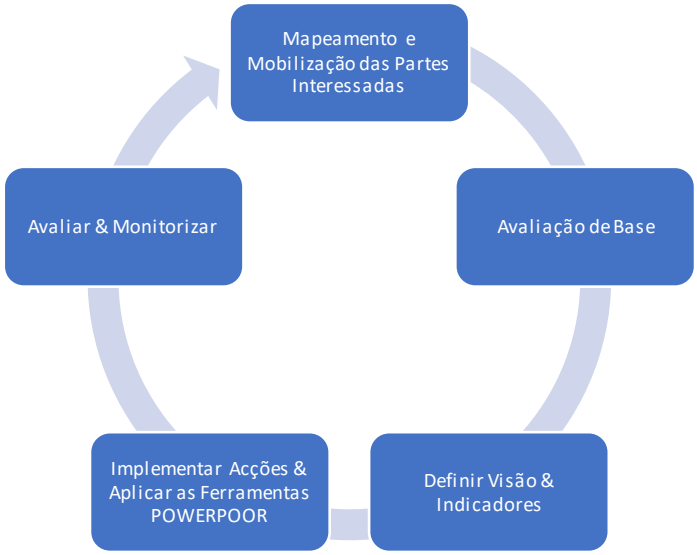
The aim of the national roadmaps is then to build on current project activities and to enable the application of the POWERPOOR approach to promote integrated energy poverty mitigation policies across all regions and cities within the pilot countries. This roadmap is a synthesis exercise based on several outputs of the Work Packages and is to be used by project partners and Energy Supporters & Mentors during the last year of the project and beyond its lifetime (also possibly to be incorporated into future Horizon projects).

Next to the project national partners, stakeholders out of the network of Energy Supporters and Mentors, especially those at the National Liaison Groups, were invited, to take ownership of the national roadmaps and take the process forward. This work resulted in lessons-learned, which, in turn, generate policy recommendations on how the national regulatory / incentive framework should be adapted to mitigate energy poverty in the first place.

The development and adoption of the national roadmap is subdivided into two phases, which each encompasses specific steps on an integrated management cycle (adapted from ICLEI Green Climate Cities Programme). The cycle has been chosen as a basis for the roadmap since it promotes a holistic approach to policy making.

Phase 1 takes place until the end of the POWERPOOR project and includes steps which shall be carried out by partners and Energy Supporters and Mentors until then. Phase 2 takes place within one year after the project, or on any other timeline decided by the partners and stakeholders. Once the cycle has been completed a first time, the process can be repeated (and could potentially serve as a basis for future projects).

Figure 29 Roadmap Methodology



Adapted from ICLEI Green Climate Cities Handbook 2016

National Roadmap Development

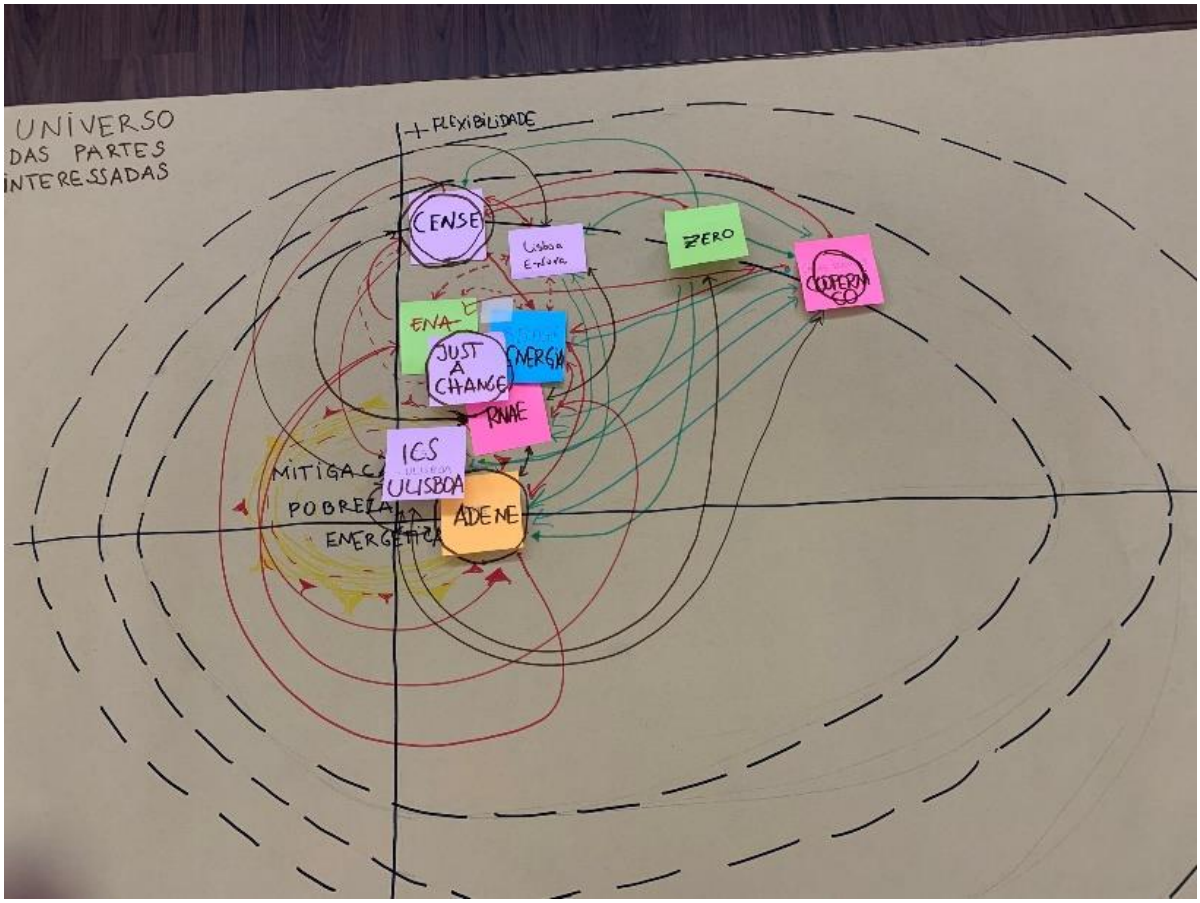
Phase 1

The following three steps correspond largely to the activities carried out within the POWERPOOR project and rely strongly on the findings of Deliverable 4.2 "Baseline Assessment Report". They will form the basis for the national roadmaps and for the subsequent steps of Phase 2.

Step 1: Stakeholder Mapping, Commitment & Mobilization

As part of D4.1, project partners have carried out an initial assessment of stakeholders who are part of the National Liaison Groups, have created an overview of the expectations the different stakeholders have towards the project as well as their influence and level of expertise. As part of the roadmapping process, it becomes important to identify the relative importance of particular stakeholder groups vis-a-vis energy poverty mitigation and to identify how flexible stakeholders are to adapt their everyday (business) practices and what kind of networks exist between them. The stakeholder universe methodology, as presented in Module 4 lends itself well for this.

Figure 30 Portugal Stakeholder Universe



ANALYSIS

The planets orbiting in the solar system whose main star is the fight against energy poverty (see figure above) represent the members of the POWERPOOR SLG.

The SLG members present at the co-creation session all positioned themselves in the upper part of the system's XX axis, which is to say that they have the flexibility to change (some more, others less) their daily actions to adapt themselves to the energy poverty mitigation demands. A good part of SLG members are energy agencies (national, regional and local) that have positioned themselves closely together as an interest group. From this group of energy agencies there are those who work in energy poverty in POWERPOOR sister projects, namely ENA, in *Ponto de Transição* project with CENSE collaboration too, another member of the Liaison Group.

The connections/relationships established between the members were also drawn, which demonstrated that most of the members establish connections (strong, medium or weak) with each other. ADENE and CENSE revealed to have a set of strong connections and energy agencies are strongly connected to each other and with the National Agency for Energy (ADENE) and the Association of Energy and Environment Agencies (RNAE).

The size of the planets was requested after the session, although discussed in it, translating their SLG members relevance (power/political) in a general way and not only in terms of alleviating energy poverty. Here the scale was none, very little, little, medium, very, quite a lot. The member that stood out the most was ADENE with VERY relevance, followed by CENSE and COOPÉRNICO with medium relevance.

Most part of these connections are related to their collaboration in common projects or working contracts.

ADENE collaborates with Public Administration bodies (energy agencies) in the execution of activities essential for the implementation of energy sector policies and measures; fosters the transfer of technologies in the energy area, promoting partnerships between R&D institutions, companies,...; Promote specialised training actions; and also develop actions inherent to raising awareness and informing companies and general public on energy issues and their associated environmental dimension.

CENSE has researchers working on Energy Poverty in Portugal and for that reason is quite requested for work in this area.

Step 2: Baseline Assessment

The state of play / baseline for what concerns energy poverty in the overall country has already been analysed at the beginning of the project and captured in D4.2. As part of the roadmap process, the baseline parameters were analysed again to see if any changes have occurred since the last baseline assessment. The baseline assessment was then validated during the meeting with the stakeholders of the National Liaison Group.

Table 45 Portugal Baseline Assessment Revision

National Energy and Climate Plans (NECPs) PNEC 2030	• Promote a long-term strategy to combat energy poverty; • Establish a national assessing and monitoring system of energy poverty, including the number of households in energy poverty; • Proceed with mechanisms to protect vulnerable consumers and study the introduction of new mechanisms; • Develop programs to promote and support efficiency energy and integration of renewable energies to mitigate energy poverty;

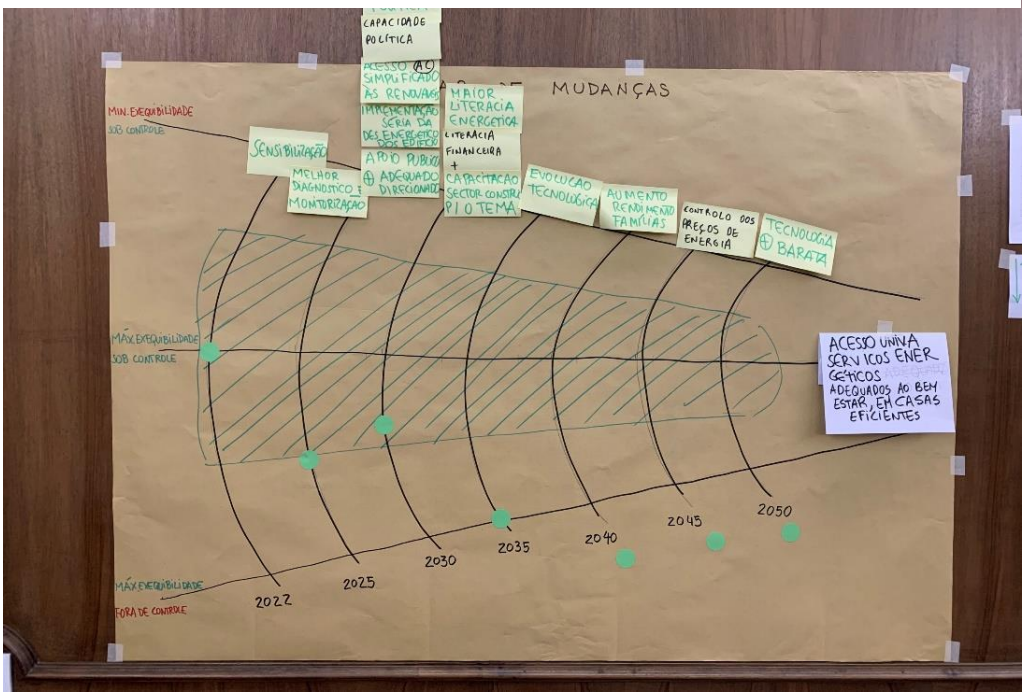
	• Promote and support local strategies to combat energy poverty; • Disseminate information to mitigate energy poverty
The building sector - renovation efforts	Existing actions to renovate buildings from Resilience and Recuperation Plan 2021-26 • Energy Efficiency in Buildings • Efficiency Voucher (only for owners and social tariff beneficiaries) • Energy Efficiency in Public Administration Buildings • Energy Efficiency for Non-Residential Buildings
Social care	Gas and Electricity Social Tariff which consists of a discount on the tariff for access to low-voltage electricity and/or low-pressure natural gas networks.
Policy to promote community-ownership of energy	Decree-Law nº 15/2022, of 14 January, which establishes the organization and functioning of the National Electric System, with provisions relating to renewable self-consumption
Policy to promote (collective) finance / crowdfunding	No Policy
The energy market (e.g., social tariffs / tax incentives)	Family support package measure (01/10/2022 to 31/12/2023): reduce the current rate of 13% to 6% of VAT on electricity - value that is focused on the first 100 kWh of electricity consumed each month, for contracted power not exceeding 6.9 kVA
Consumer protection	• Energy bill protection. Mechanisms to support families in difficulty and do not pay energy bills from an energy and network;

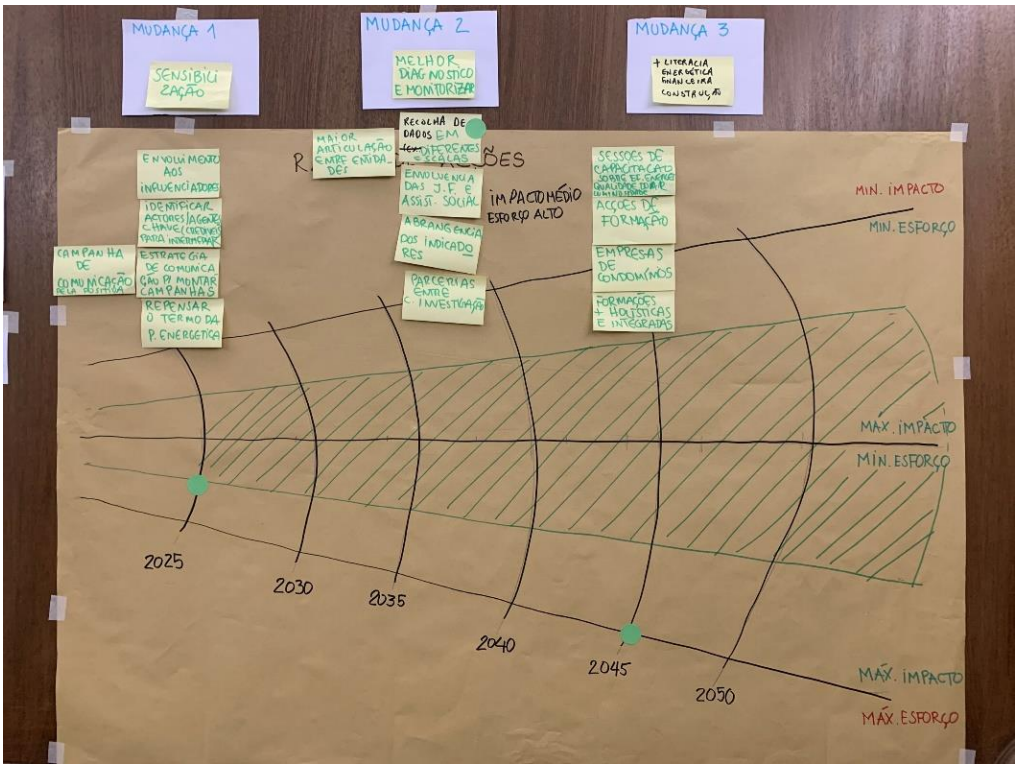
	• Renewable energy communities. Integration of low income families in both new projects and renewable anergy communities; • Identification. Develop and implement mechanisms to identify families in energy poverty.
SECAPs	Nothing addressed
Long-Term Strategy for Building Renovation 2050 ELPRE	See D4.2.
National Strategy for Energy Poverty (not yet in force)	See D4.2.

Step 3: Set Vision, envision Actions and define Indicators

Now that the stakeholders have been gathered, committed and the national regulatory context reassessed, it was time to foster a common understanding on what alleviating energy poverty actually means for the different stakeholder groups. During the stakeholder consultation, a concrete vision for energy poverty mitigation was created and the future radar methodology lends used for this purpose. Discussions on the possible actions thus took place based on a common reference scenario (the vision).

Figure 31 Portugal Future Radar





ANALYSIS

The Future Radars exercise sparked dynamics in the group and everyone contributed actively to defining the ideal future for Portugal in 2050 and which Changes should occur to achieve the defined envisioned future: **UNIVERSAL ACCESS TO ADEQUATE ENERGY SERVICES FOR WELL-BEING, IN EFFICIENT HOUSES**

When Changes were analysed in terms of their feasibility and whether they would be under control of the SLG members, only 3 Changes were left inside the cone, which two of them were on the borderline between having/not having control over these Changes.

Those Changes were analysed from the point of view of the necessary Actions to effectively achieve them.

Actions were analysed from the point of view of their impact and effort to achieve them, resulting in a 12 Actions ensemble. SLG concluded our group had inability to point out at least one action with max impact and min effort. The 12 Actions are distributed among the 3 Changes initially listed as feasible and under the control of SLG members.

It was consensual that more collaboration, cooperation and articulation between institutions is needed.

Finally, it was suggested that Portugal should learn from the experience of other countries.

Table 1 Portugal Actions

Policy Sector	Actions to be implemented	By when?	By whom?
Social care	Regulation to co-finance the electricity cost of energy poor households	2024	Ministry of Social Affairs
Buildings	100% grant support to homeowner's associations for energy renovation of multi-family buildings in social housing developments	2023	Ministry of Energy
Cross-cutting	Change 1. Awareness-raising • Influencer involvement • Identifify key-actors/agents, beliveable, to intermediate • Communication strategy to build positive campaigns • Rethink energy poverty term	2025 (year/time not discussed)	

Cross-cutting	Change 2. To get better diagnosis and monitoring • Data collection at different scale/level • Greater articulation between entities • Both parish councils and social care department of municipalities involvement • Scope of indicators • Partnerships between research centers	2030 (year/time not discussed)	
Cross-cutting	Change 3. To increase both financial and energy literacy and also capacity for building construction professionals • Training offers on energy efficiency, air quality, lighting quality, acoustic, … , resulting in a more holistic and integrated trainings • Training seminars • Property management companies' involvement	2035 (year/time not discussed)	

The column of who implements the actions was not filled in because the whole working session of National Roadmap co-creation was focused on the Stakeholders Liaison Group members and their power and capacities to intervene/influence. Actions reflect SLG members effort capacity and none of them was placed into the green cone (max. Impact & min. Effort).

Table 46 Portugal Action-Specific Indicators

Indicator	Baseline (2022)	Target (date dependent on action)
Number of Energy communities (with a focus on lowering energy bills of members)	5	200 (2035)
Number of awareness-raising campaigns per year	0	15/year
Number of municipalities with OSS for energy poverty mitigation	3	100 (2030)

Phase 2

Step 4: Implement Actions and apply POWERPOOR Toolkit

The national roadmap co-creation session with the Stakeholders Liaison Group worked very well. The group understood the methodology and cooperated with the exercises. Later on, there is a possibility of repeating this session where national, regional and local, public and private entities will be considered for the mapping of Stakeholders and subsequent completion of the Future Radars. The discussions did not produce outcomes in terms of budget and scheduling for the actions in all cases. This is why it was chosen to present the actions in a different format for the Portuguese roadmap when compared to the other roadmaps.

Table 47 Portugal Action Elements

Actions Related To Change 1. Awareness

Influencers Involvement
Find influencers who are already involved in sustainability issues and work out with them contents for this theme

Identify Key-Actors/Agents, Beliveable, To Intermediate
Identify who are the professionals which can play an intermediary role indicating families in a potential situation of energy poverty. These professionals must be trusted by the population and exempted (e.g. police officers who regularly visit isolated elderly people as part of their patrols).

Given the difficulties in reaching the most vulnerable/energy poverty populations, it is crucial to establish valid intermediaries' figures as facilitators who ensure effective and successful action. These key agents should belong to the target intervention areas, be an active part of the community, allowing closer contact with locals, facilitating trustful relationships needed to establish effective action, creating bridges to overcome common barriers (mistrust, fear of unknown third parties, fear of poor stigmatization, etc.).

Communication Strategy To Build Positive Campaigns

Development of more inclusive and effective strategies aimed at reaching the most vulnerable consumers. These communication strategies should focus on the vulnerable consumer, that is, those who communicate should put themselves in the consumer's shoes. Through knowledge of their characteristics, their condition, and also by studying successful practices in engagement and communication with this type of consumers, create a communication that promotes engagement and participation.

Action to combat energy poverty necessarily requires the establishment of a communication strategy to ensure, in a clear, specific and measurable way, that messages and information arrive efficiently. For a successful dissemination, the target groups must be defined (citizens and deprived communities suffering from energy poverty, local authorities, social action agents, scientific community, media, etc.) to whom different messages, communication tools and actions, timing, budget, evaluation and monitoring measures must be adapted.

Supported by a communication agency to create a national campaign to raise awareness, disseminated through various media: radio, TV, social media and print

Rethink Energy Poverty Term

The term Energy Poverty may be a cause of exclusion and less participation/involvement in these campaigns because vulnerable consumers may think they are not poor and campaigns are not for them, or simply reject the idea of being characterized as poor, by the associated social stigma. In this way, alternatives should be analysed regarding the description of this problem, which allow creating through a more positive language, a greater connection between the communicator and the target audience.

Actions Related To C2. Better Diagnosis And Monitoring

Data Collection At Different Scale/Level
Increasing data collection both by central administration and by governments and entities at local scale, for example through surveys dedicated to the study of this problem, to collect various types of data - socio-economic, perception of thermal comfort, energy performance of buildings. Data collection processes through devices such as temperature and air quality sensors or energy consumption measurement should also be considered. Researching data already available and collected for other purposes by public bodies at national and local scale, which could be used in the context of energy poverty measurement. Data collection events, to be created or even existing ones, such as the Household Energy Consumption Survey, should be carried out with greater spatial disaggregation and higher temporal frequency, in order to allow monitoring of energy poverty levels. Articulation between different entities which organise surveys (INE, Universities, DECO, etc.) in order to take advantage of the moment when surveys/census are carried out to insert new questions on the subject. Work on key issues so that we have indicators that can be used

Greater Articulation Between Entities
Greater transfer of knowledge and experience between different entities in the fight against energy poverty, namely from entities dedicated to study and diagnosis, such as universities and research centers, and the entities responsible for the creation of policies and instruments to support vulnerable consumers. The aim is to increase cooperation between entities working towards the same goal. Create a working group platform where we can continue to work on this matter after POWERPOOR project end. Stimulate reflection actions such as this first one, where concrete solutions to solve this social problem may emerge.

Parishes And Social Care Department Of Municipalities Involvement
Parishes and social workers develop close relationships with families that may be in energy poverty. Their involvement in monitoring processes is valuable. Involvement of parishes and other entities that have a closer connection to the households and are more trusted, in order to collect important information, identifying vulnerable households and causes of vulnerability, creating appropriate solutions. In the fight against energy poverty, any successful action will require the involvement and commitment of the Municipal Councils (namely their Offices for Energy Efficiency, Municipal Public Housing, Social Action, Social Rights, Health, etc.), as well as the Parishes, as the public entities closest to the citizens and those who know the problems of their residents.

Meet with Social Action Departments, Misericórdias Association and Parishes previously selected as having identified poverty rates.

Scope of Indicators

The indicators used to measure energy poverty must be multiple and must cover its various dimensions (e.g. it is not enough to know the share of energy expenditure in income nor whether there are arrears on utility bills, it is necessary to understand the quality of the various energy services use).

The diagnosis of energy poverty should be carried out through indicators that have the capacity to represent different causes and to determine this phenomenon factors. The indicators must be suitable for this problem assessment at different spatial scales over time, to allow the impact of mitigation measures assessment and vulnerability levels monitoring. They should also be inclusive, considering different energy poverty expressions (e.g. too much vs. too little energy consumption), as well as consider objective (energy consumption, income or temperature values) and subjective (sense of comfort and/or ability to ensure energy levels) perspectives. Indicators should also consider and represent the vulnerability situation of different groups considered as more vulnerable, such as elderly people, single parents, people with disabilities or chronic diseases and ethnic minorities.

Partnerships Between Research Centers

Greater exchange of data and knowledge between different research centers working on the mitigation of energy poverty, in order to create synergies and promote collaborations, for a combination of efforts and experiences that enhance the development of more complete, less redundant and more informative research.

Actions Related To C3. Increasing Energy And Financial Literacy & Capacity Building On Energy Poverty For Construction Sector Professionals

Training Offers on Energy Efficiency, Air Quality, Lighting Quality, Acoustic, … , Resulting an a More Holistic And Integrated Trainings

Knowledge about the measures to be implemented to increase energy efficiency, etc. of buildings is not yet consolidated in Portuguese society, so it is necessary to offer the population opportunities to access detailed, concrete, independent (without commercial interest) and credible information. Sessions in which experts (from ADENE, for instance) address these issues, held in person and online, contribut to disseminate this knowledge.

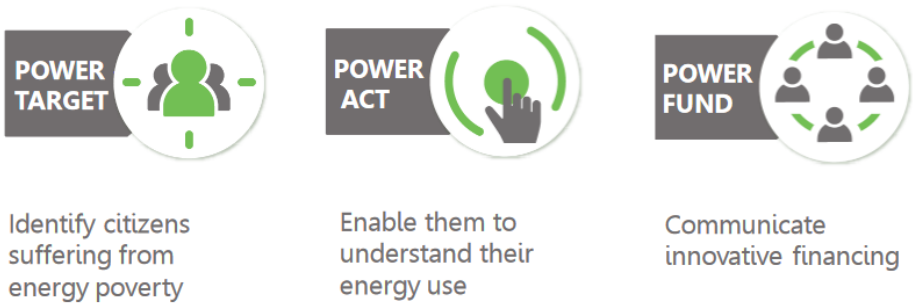
Training sessions aimed at households on adequate living conditions that must be taken into account when choosing an house and indoor quality of life maintenance. A holistic approach should be considered regarding the quality of life inside buildings, integrating aspects and indicators of energy efficiency, air quality, luminosity and acoustics.

Training Seminars
Brief description ADENE already has training sessions on the ground.

Property Management Companies Involvement
Property management companies' involvement in energy efficiency solutions proposals, access to tax benefits or support programmes addressed to householders, their clients. Social housing managers can also have this involvement. Create training/informational sessions aiming property management companies to become more informed and be able to provide relevant information to households. Create mechanisms that allow property management companies to bring Energy Poverty to Condominium Assemblies but without increasing costs to householders. The POWERPOOR toolkit is incremental to the implementation of the individual actions and should be used actively by whichever stakeholder (e.g. municipality or POWERPOOR partner) has been identified, in the previous steps, as being responsible for implementation.

The POWERPOOR toolkit is incremental to the implementation of the individual actions and should be used actively by whichever stakeholder (e.g. municipality or POWERPOOR partner) has been identified, in the previous steps, as being responsible for implementation.

Figure 32 POWERPOOR Toolkit



Step 5: Monitor & Evaluate

One year after completion of the POWERPOOR project (or any other timeframe decided upon during the stakeholder consultations), the first monitoring & evaluation process should take place to see whether the roadmap's actions, and ultimately its vision, are being met.

Table 48 Portugal Action-Specific Indicators

Indicator	**Baseline (2022)**	**Target (date dependent on action)**	**Target achieved?**
Number of Energy communities (with a focus on lowering energy bills of members)	5	200 (2035)	
Number of awareness-raising campaigns per year	0	15/year	
Number of municipalities with OSS for energy poverty mitigation	3	100 (2030)	

This table tracks the progress of general energy poverty indicators leaning on the categorization provided by EPAH.

Table 49 Portugal General Energy Poverty Indicators

Indicator	Baseline (2022)	Target and Date (Vision)	Target achieved?
Inability to keep home adequately warm	16,4% (2021)		
High share of energy expenditure in income	15,1% (2015)		
Arrears on utility bills	5,3% (2021)		
At risk of poverty or social exclusion	19,8% (2020)		

Household electricity price	0,21 €/kWh (2021)		
Dwellings with energy label C or lower	69,6% (2020)		
Pop. Living dwelling with presence of leak, damp and rot	25,2 % (2020)		
Excess winter mortality/deaths	24,9% (2014)		
Long-Term Strategy for Building Renovation which concerns to renovate buildings, improving thermal comfort and reducing energy bills. 620 M€ for energy efficiency in buildings. (**ELPRE**)	Renovated buildings area	For 2030 – 363 M of m2 For 2040 – 635 M of m2 For 2050 – 747 M of m2	
	Primary energy savings	11% for 2030 27% for 2040 34% for 50%	
	Reduction hours of discomfort in households	26% for 2030 34% for 2040 56% for 2050	
National Strategy for Energy Poverty (not in force yet)	Reduce Pop. with inability to keep home adequately warm (18,9% Pop. in 2018)	15% in 2030 5% in 2040 1% in 2050	
	Reduce family units whose energy expenditure represents +10% of total income (1,2 M in 2018)	To 700 000 in 2030 To 250 000 in 2040 To 0 in 2050	
	Reduce Pop. Living in dwelling with presence of leak, damp and rot (2,5 M = 24,4% population)	To 20% in 2030 10% in 2040 Less than 5% in 2050	

Recommendations on how to implement the national roadmap

The above process will have resulted in a national roadmap which has been co-created with a diverse group of stakeholders from the POWERPOOR National Stakeholder Liaison Groups. Following the national policy dialogues and consultations, partners will reflect on the roadmap drafting process and can suggest additional recommendations to specific stakeholder groups on HOW the above-listed actions can be implemented.

For Sub-National Governments

Identify mediators/partners to bridge Energy S&M and energy poverty householders

For National Governments

Creation of a good and robust campaign strategy to facilitate successful campaigns to tackle energy poverty

Greater political will and capacity to tackle energy poverty effectively

Better access to renewable energy production (community/cooperative)

For Civil Society

For The Private Sector

Property management companies should invest more in training their agents to provide clients with a service that is more focused on the energy efficiency of buildings

13. National Energy Poverty Mitigation Roadmap of Spain

Introduction

Why set a national energy poverty mitigation roadmap?

In the POWERPOOR project, partners are actively assessing causes of energy poverty and suggest short-term and collective energy action solutions to mitigate this problem. A highly diverse network of Energy Supporters and Mentors has been trained and is being engaged to further support energy poor households to implement solutions. The project also sets up Local Energy Poverty Mitigation Offices in engaged municipalities. POWERPOOR strives to trigger high-impact change, not only on the local and regional level, but also on the national and European level. Such a multi-level governance approach will result in long-lasting impact and coordination between local needs and national (e.g. National Energy and Climate Plans) and supra-national enabling frameworks.

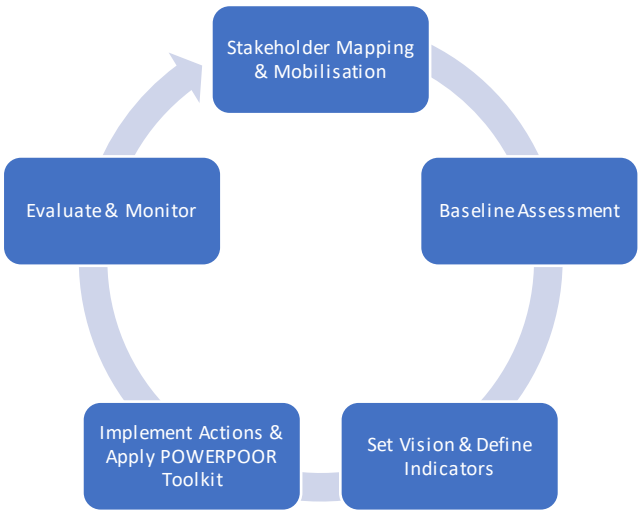
The aim of the national roadmaps is then to build on current project activities and to enable the application of the POWERPOOR approach to promote integrated energy poverty mitigation policies across all regions and cities within the pilot countries. The key content defined in the national roadmaps will input the POWERPOOR exploitation plan as well as the POWERPOOR EU Policy Roadmap.

What is the methodology for the national roadmaps?

The development and adoption of the national roadmap is subdivided into two phases, which each encompasses specific steps on an integrated management cycle (adapted from ICLEI Green Climate Cities Programme). The cycle has been chosen as a basis for the roadmap since it promotes a holistic approach to policy making.

Phase 1 takes place until the end of the POWERPOOR project and includes steps which shall be carried out by partners and Energy Supporters and Mentors until then. Phase 2 takes place within one year after the project, or on any other timeline decided by the partners and stakeholders. Once the cycle has been completed a first time, the process can be repeated (and could potentially serve as a basis for future projects).

Figure 33 Roadmap Methodology



Adapted from ICLEI Green Climate Cities Handbook 2016

National Roadmap Development

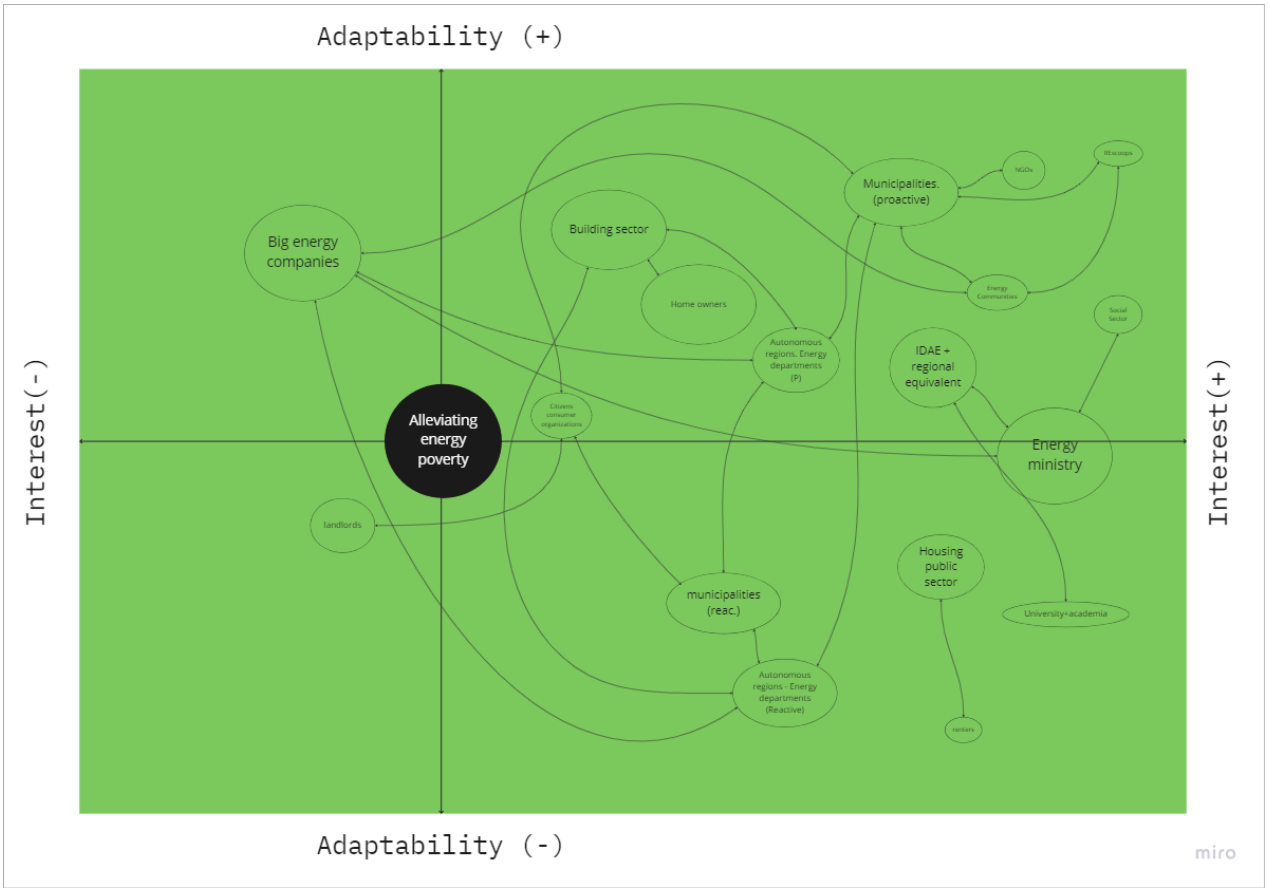
Phase 1

The following three steps correspond largely to the activities carried out within the POWERPOOR project and rely strongly on the findings of Deliverable 4.2 "Baseline Assessment Report". They will form the basis for the national roadmaps and for the subsequent steps of Phase 2.

Step 1: Stakeholder Mapping, Commitment & Mobilization

As part of D4.1, project partners have carried out an initial assessment of stakeholders who are part of the National Liaison Groups, have created an overview of the expectations the different stakeholders have towards the project as well as their influence and level of expertise. As part of the roadmapping process, it becomes important to identify the relative importance of particular stakeholder groups vis-a-vis energy poverty mitigation and to identify how flexible stakeholders are to adapt their everyday (business) practices and what kind of networks exist between them. The stakeholder universe methodology, lends itself well for this (Climate KIC Visual Toolbox for System Innovation 2020).

Figure 34 Spain Stakeholder Universe



The stakeholders with the biggest potential identified to alleviate energy poverty have been energy cooperatives, energy communities, municipalities with proactive attitude and NGOs. For the first two ones, even if they often do not have direct relation with the most vulnerable citizens, their motivation and their innovative ways to organise in the energy sector make them key stakeholders when tackling energy poverty. For the NGOs and the proactive municipalities instead, they are often very related to vulnerable communities and directly address energy poverty, but usually they lack of resources such as economic, knowledge or human resources. In this regards, a close collaboration between the four mentioned stakeholders is essential to alleviate energy poverty at the local level. It is important to mention that in the Spanish Stakeholder Liaison Group there are stakeholders from each of the mentioned type of stakeholder, and that several NGOs together with the civil society work as a reference in energy poverty at the national level.

Municipalities often depend on the regional administration, both in a positive and a negative way, meaning that a proactive regional administration can be an important driver to municipalities when alleviating energy poverty. Therefore, the regional administration and specially their energy/environmental departments are identified also as important actors to build adequate conditions for the local administration as well as other organisations, and support them carrying out actions to tackle energy poverty. When it comes to the national level, specially the energy ministry has a very important role in improving the situation of the vulnerable citizens. However, their complex

structures and the pressure from the big companies makes it difficult for them to apply ambitious legislation that would have a very positive impact on the citizens, and especially on the most vulnerable ones.

In relation to that, big energy companies are also seen as essential actors that have a big impact on the consumers. However, there are often conflicts of interests between many of the actions that are carried out to alleviate energy poverty and their own interests as businesses, negatively affecting on their motivation to tackle energy poverty. The main drivers for the big energy companies to carry out actions in this line are normally the national regulation and the public image.

Finally, the public housing sector and the academia are actors that have interest of improving the situation, but both of them have limited adaptability. For the academia it is difficult to directly reach vulnerable communities, but they have an important role on providing with real data and advice to the decision makers. At the same time, the housing sector is often directly related to vulnerable citizens, but the capacity to act limited and is usually depending on other sectors, for example the national or regional government or the building sector.

Step 2: Baseline Assessment

The state of play / baseline for what concerns energy poverty in the overall country has already been analysed at the beginning of the project and captured in D4.2. As part of the roadmap process, it is recommended to revaluate the baseline parameters to see if any changes have occurred since the last baseline assessment.

Table 50 Spain Baseline Assessment Revision

National Energy and Climate Plans (NECPs)	Integrated national plan for climate and energy 2021-2030 "+ Energy Security" plan: Increase the protection of vulnerable consumers, households and companies, in addition to the measures already adopted. Both energy saving measures and replacement by renewables as well as specific measures to support consumers contribute to this. When it comes to the protection to vulnerable consumers, the followings measures are adopted: the creation of the minimum vital supply, an increase of the social bonus discounts (electricity and thermic), and an increase in the number of consumers who can benefit from the discount.

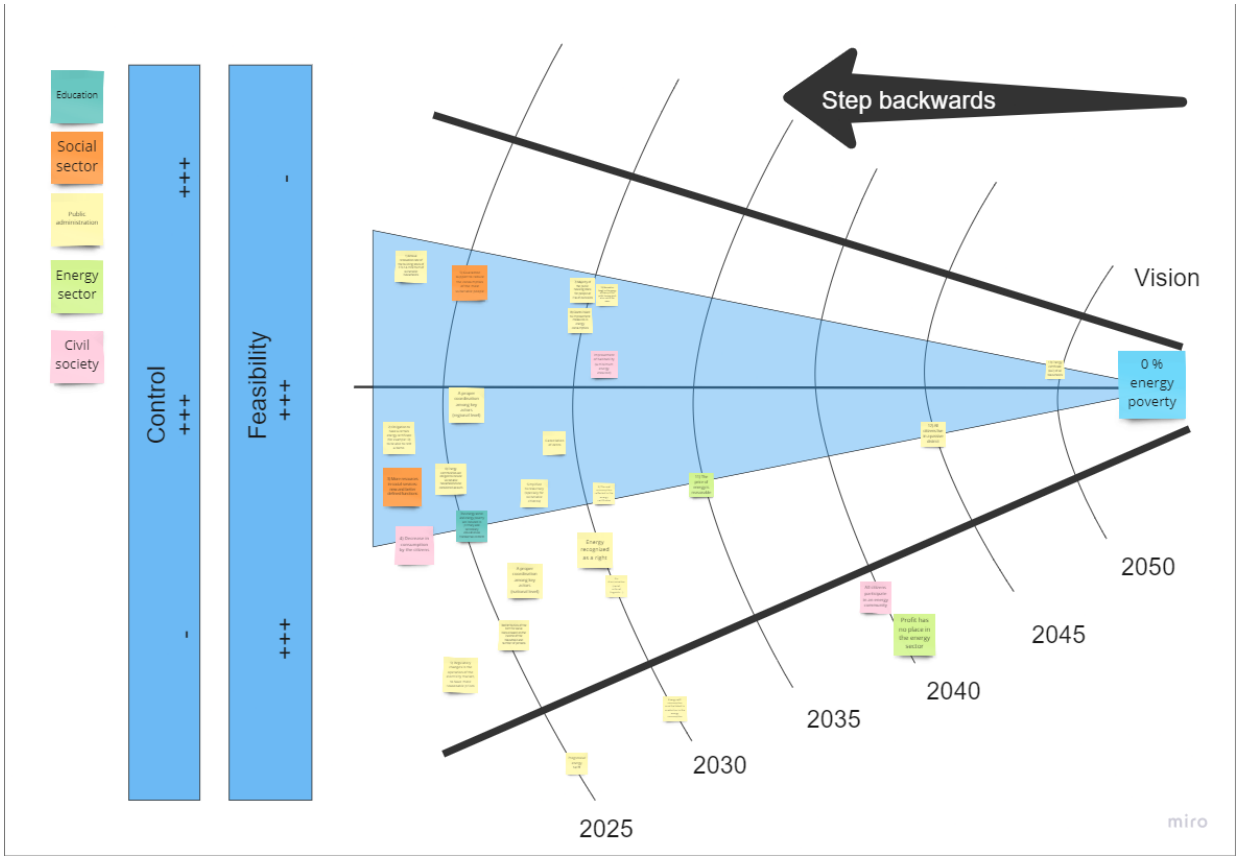
The building sector - renovation efforts	Long term strategy for building sector energy efficiency renovation. 2020 update. Special attention is put to vulnerable households when providing public grants, as well as other mechanisms. Approaches for the housing package in energy poverty: - Territorialized segmentation by provinces of households in energy poverty. - Intervention menus for the rehabilitation of homes in energy poverty.
Social care	National strategy against energy poverty 2019-2024. Four main axes: - Improving awareness of energy poverty. - Improving the response to the current situation of energy poverty. - Creating a structural change for the reduction of energy poverty. - Consumer protection measures and social awareness. RD 37/2020 Urgent actions for taking care of social and economic vulnerable situations within transport and housing: Prohibition to suspend the energy supply to consumers defined as vulnerable.
Policy to promote community-ownership of energy	RD 244/2019 Regulation of administrative, technical and economic conditions for the electricity's self-consumption. RDL 23/2020 Measures in the field of energy and in other areas for economic reactivation: simplification of administrative procedures to improve the access to renewable energy sources.
Policy to promote (collective) finance / crowdfunding	Law 5/2015 Promotion of business financing: establishment of a legal regime

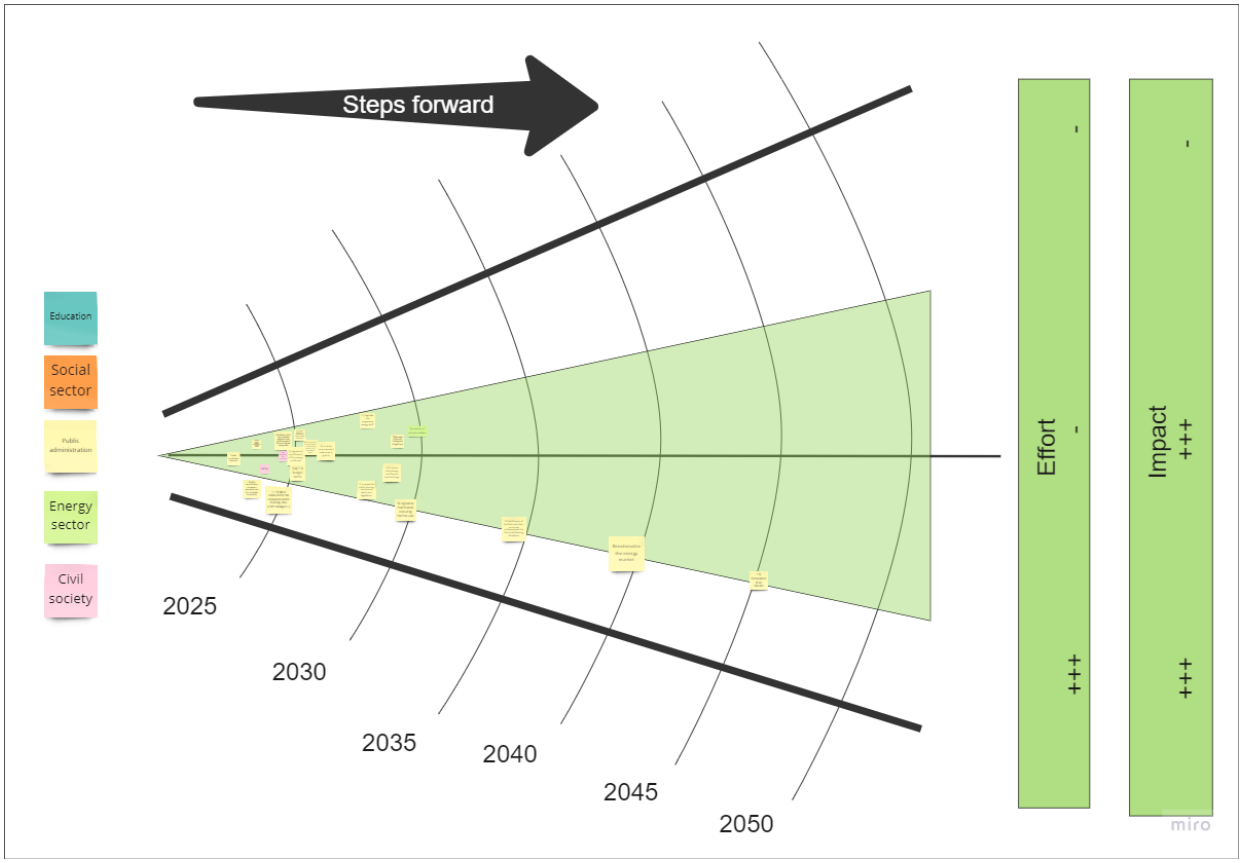
	for participatory financing platforms (crowdfunding).
The energy market (e.g. social tariffs / tax incentives)	RDL 23/2021 Urgent measures in the field of energy for the protection of consumers and the introduction of transparency in the wholesale and retail markets for electricity and natural gas. These are the main measures related to energy poverty: - Temporary increase of the social bonus discount (both electricity and thermic). - Transparency in wholesale markets. - Transparency in retail markets: obligation to report changes in contract conditions one month in advance and transparent, comparable, adequate and up-to-date information on prices.
Consumer protection	RDL 1/2021 Consumer protection against economic & social vulnerable situations: recognition of the figure of vulnerable consumer, putting on them special attention in other sectors. RDL 23/2021 Urgent measures in the field of energy for the protection of consumers and the introduction of transparency in the wholesale and retail markets for electricity and natural gas.

Step 3: Set Vision, envision Actions and define Indicators

Now that the stakeholders have been gathered, committed and the national regulatory context reassessed, it is time to foster a common understanding on what alleviating energy poverty actually means for the different stakeholder groups. During the stakeholder consultation, a concrete vision for energy poverty mitigation is created. The future radar methodology lends itself well for this purpose (Climate KIC Visual Toolbox for System Innovation 2020).

Figure 35 Spain Future Radar





The selected vision for the future radar tool has been 0% energy poverty for 2050.

Most of the actions to be carried out have been located at the beginning of the second cone, reflecting the need and urgency of taking actions in various sectors and levels. Most of the actions are identified as responsibilities of the public administration, and the focus when proposing the actions has been put on the coloured area of the first cone, where there is more control and feasibility. Some of the key envisioned changes are out of the coloured zone, thus the actions for the respective changes are out of the scope of this roadmap.

The first action to carry out would be to create coordination networks, at national as well as regional levels. This would strengthen the relations between the different actors, specially the key ones identified in the Stakeholder Universe exercise, and would significantly improve the required effort and obtained impact of the rest of the actions. Following that, several actions have been proposed to reach the goal of 0 % energy poverty by 2050, which are described in the following pages.

Table 51 Spain Actions

Policy Sector	Actions to be implemented	By when?	By whom?
Social sector	Coordination networks creation between different stakeholders	2024	Ministry of Social Affairs, Regional authorities, social sector actors.
Consumer protection, Finances, Market	Promoting Social & Solidarity economy; i.e. Tax exemption for Social and Solidarity Economy initiatives.	Starting 2023	Ministry of finances
Citizen's participation	Networking and advocacy: Citizenship to make organized advocacy for energy poverty mitigation.	2024	Citizenship
Buildings	Identification of the most vulnerable neighbourhoods to prioritize areas of intervention for building renovation. The strategies should include not only building renovation but livelihood capacity building for people in these areas with special attention to employment policies.	2023	Ministry of Transport, Mobility and Urban Agenda. Regional authorities.
Energy	Social aspects to be considered in energy communities such as vulnerability. Inclusion of energy poverty in the legal definition of the energy community. Citizenship awareness about energy poverty.	2025	Ministry of Energy. Energy communities promotors.
Energy	Progressive energy tariff introducing energy tariffs relative to different income levels & energy tariffs relative to energy consumption/person. Tariffs modification and taxes via	2028	Ministry of energy. Energy cooperatives

	legislation and energy cooperatives also offering tariffs with these criteria.		
Buildings	Modify/addition to the existing EPC (Energy performance certificate) for considering not only the quality of the building but the use of energy of its inhabitants.	2025	Ministry of Transport, Mobility and Urban Agenda. Regional authorities.
Buildings	Increase resources for Energy offices and include energy poverty in their responsibilities	2026	Ministry of Social Affairs, Regional authorities,
Buildings	Public funding for building renovation should be linked to the energy improvement in energy efficiency before and after the renovation.	2026	Ministry of Transport, Mobility and Urban Agenda. Regional authorities.
Buildings	Increase of public housing stock (funding and legislation)	2028	Ministry of Transport, Mobility and Urban Agenda. Regional authorities.
Energy market	Promotion of non-profit energy retailers.	2030	Ministry of energy
Energy market	Public companies to recover relevancy in the energy market. For example: Public company for national water reservoirs exploitation instead of private companies or public company for electricity commercialization (France case).	2040	Ministry of energy
Buildings	All buildings have A to C certificate through renovation.	2045	Ministry of Transport, Mobility and Urban Agenda. Regional authorities.

For each of the co-identified actions, indicators are defined to enable monitoring progress at regular intervals.

Table 52 Spain Action-Specific Indicators

Indicator	Baseline (2022)	Target (date dependent on action)
Number of shared experiences about energy communities that include vulnerable citizens.	1	5 (2024)
Number of trained people in training courses for professionals in the social sector	-	80 (2024)
Number of actions to improve the accessibility of grants and other support	-	5 (2024)
Number of renovated homes	-	50 (2024)
Number of households attended using online tools	3,000	4,000 (2024)
Number of updated energy poverty indicators for the territory of Gipuzkoa	-	4 (2024)
Number of people attended in energy offices	-	1,000/year
Number of coordination networks at a regional level	-	1/region (2024)
Number of participants in collective sessions	-	50 (2024)

with vulnerable citizens		
Number of households participating in municipal shared self-consumption	-	2,000 (2024)
Number of improved energy bills of vulnerable households	-	600 (2024)
Number of Social and Solidarity Economy networks	-	1/region (2025)
Number of renovated vulnerable neighbourhoods	-	1/municipality (2030)

Phase 2

The previous first three steps of the management cycle laid out the basis for the national roadmaps. The results inform the next two steps that take place after the closure of POWERPOOR project.

Step 4: Implement Actions and apply POWERPOOR Toolkit

This is where the concrete actions, defined previously, are implemented according to the established timeline.

Figure 38 POWERPOOR Toolkit

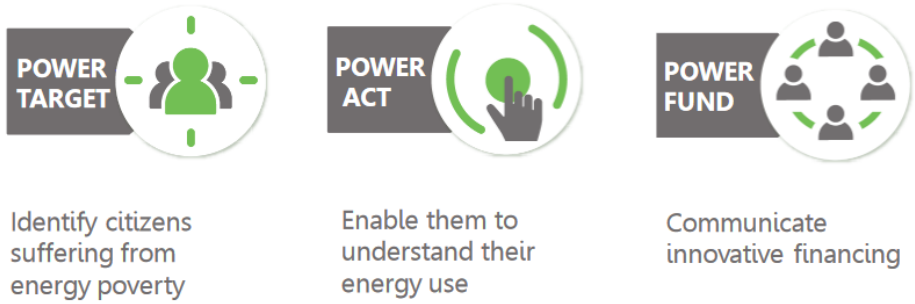


Table 53 Spain Action Elements

Knowledge sharing to promote energy communities that include vulnerable citizens	
The responsible entity and leading person	Socaire association
The target group for the action	Neighbouring communities including vulnerable families
Action design	Share experiences between the entities that are promoting energy communities with energy poverty criteria.
Scheduling	2023-2024
Budget	TBD
Drivers	Already built network (telegram group included) between the different stakeholders that collaborate in the Powerpoor project
Barriers	Time availability of the people involved

Training courses	
The responsible entity and leading person	AeioLuz and collaborating associations
The target group for the action	Workers and social educators
Action design	3 training courses for social workers and social educators in social intervention to include the energy vulnerability perspective in their work. Trainings about understanding and improving the energy bill, the domestic use of energy, and other interventions with vulnerable citizens.
Scheduling	2023
Budget	6,000 €
Drivers	The need for training and retraining
Barriers	Social workers not used to energy related concepts.

Make language and methodology accessible	
The responsible entity and leading person	Ecoserveis
The target group for the action	Vulnerable groups directly
Action design	Make calls for funding related to energy poverty mitigation accessible in language and methodology for assuring access to this

	funds to vulnerable people. Prepare specific awareness campaigns for vulnerable people to take advantage of the public funding options available.
Scheduling	2023
Budget	TBD depending on the call/campaign
Drivers	
Barriers	Funding

Express building renovation actions for vulnerable families.	
The responsible entity and leading person	ECODES
The target group for the action	Vulnerable households
Action design	Increase rapid rehabilitation actions for buildings in situations of energy poverty, including the installation of renewable energies. With accompanying actions before, during and after to adapt habits on the energy use in the renewed housing.
Scheduling	2023
Budget	3,000-8,000 € per household depending on the available funding
Drivers	The need to address structural measures that improve housing comfort. Supports for renovation.
Barriers	Funding

Adaptation of a tool for energy poverty considerations	
The responsible entity and leading person	ECODES
The target group for the action	Municipal and NGO workers and social educators and volunteers
Action design	Update of the ENERSOC tool for social management of domestic energy to help non-energy personnel and volunteers in energetic diagnosis and energy hiring recommendations, social bonus, housing and energy micro-efficiency measures.
Scheduling	2023
Budget	TBD
Drivers	
Barriers	

Energy poverty data update in Gipuzkoa region	
The responsible entity and leading person	Provincial Council of Gipuzkoa Environmental Department
The target group for the action	Citizenship of Gipuzkoa
Action design	Elaboration of the Gipuzkoa Energy Poverty Study 2022-2023, a basic diagnosis for planning to combat energy poverty (latest data from 2015), in collaboration with the Department of Social Policy, through the Gipuzkoa Poverty and Social Exclusion Survey
Scheduling	2023
Budget	10,000 €
Drivers	Energy Poverty Observatory of Gipuzkoa
Barriers	Difficulties of obtaining detailed data and the complexity of measuring energy poverty.

Creation of specific energy poverty service	
The responsible entity and leading person	Energy Office of Oarsoaldea Development Agency
The target group for the action	Citizenship affected by energy poverty
Action design	Personalized service specialized in energy poverty. Linked to the Oarsoaleda Energy Office, it is proposed to create a personalized service that is specific to treat situations of energy poverty for customers of the Oarsoaldea Energy office or in any other public or private service that attends people in situations of vulnerability. Transversally, daily awareness-raising campaigns targeted at various groups.
Scheduling	2023 - 2026
Budget	TBD
Drivers	Establishment of identification and referral protocols. In-person and mobile office care.
Barriers	Citizens not aware of the services.

Technical network for energy poverty work	
The responsible entity and leading person	Energy Office of Oarsoaldea Development Agency

The target group for the action	All actors involved in the network and citizenship
Action design	Technical coordination network to alleviate energy poverty. Establishment of a network of coordination and exchange of information between public and private actors that interact with groups in situations of energy vulnerability, creation of detection and referral. In collaboration with social services, public services for housing, education and/or public health, third sector entities, rehabilitation office of Oarsoaldea, Goiener.... Protocols and communication channels for the dynamization of the network.
Scheduling	2023
Budget	4,950 €
Drivers	Establishing protocols. Presence of key agents. Promoting more coordinated management will make managing energy poverty more predictable, rapid and efficient. The network can also serve as a laboratory of ideas for new proposals, monitoring and validation...
Barriers	Engagement of the actors involved, related to the lack of sufficient resources.

Training actions for energy poverty identification	
The responsible entity and leading person	Energy Office of Oarsoaldea Development Agency
The target group for the action	Professionals working with vulnerable groups
Action design	Training for professionals. Technical training on basic concepts of energy, regulation and identification of cases of energy poverty addressed to social service professionals and any other public or private service in contact with citizens and vulnerable groups. It would be adaptable but focused on regulation and detection and management of energy poverty.
Scheduling	2023
Budget	4,900 €
Drivers	

Barriers	Availability of persons to be trained

Coordination for rural areas assistance	
The responsible entity and leading person	TEDER association
The target group for the action	Vulnerable population of municipalities of the region of Tierra Estella
Action design	Strengthen the coordination between the regional agency as well as energy office TEDER and the regional social services to create a support network in the rural area of Tierra Estella.
Scheduling	2023
Budget	TBD
Drivers	Need to reach the entire town of the territory
Barriers	Availability of the Social Services

Trainings for vulnerable population	
The responsible entity and leading person	Cáritas Bizkaia
The target group for the action	Vulnerable population involved in actions of Caritas Centres in Bizkaia
Action design	Briefings with people in situations of social vulnerability on appropriate household energy use measures and recommendations for maximum use. Generate a typical session with content to transmit. Presentation support
Scheduling	2023
Budget	
Drivers	Activities, workshops in which people already participate and in which we disseminate the sessions and attract attendees
Barriers	Sufficient knowledge to design/activate sessions

Collective advising sessions and support groups	
The responsible entity and leading person	Las Naves and the Energy office of Valencia. Victoria Pellicer.
The target group for the action	Vulnerable households

Action design	Collective sessions to learn, advice and share about how to improve the energy bills, the energy use and other aspects related to energy poverty, considering its implications in the health. One session per month, during 2023. Action promoted by the WELLBASED project.
Scheduling	2023
Budget	8,000 €
Drivers	Resources from EU projects, municipal energy office and its network. The need to strengthen collective support and reduce the individual guilt.
Barriers	Lack of time. Citizens often do not see it as a relevant aspect.

Socialize the energy of municipal self-consumption	
The responsible entity and leading person	Municipality of Valencia
The target group for the action	Vulnerable households
Action design	To work on the aspect of how to take advantage of local resources to support vulnerable citizens through the photovoltaic self-consumption.
Scheduling	2023
Budget	
Drivers	Update of the self-consumption regulation. Municipal and political will.
Barriers	Lack of real cases and models. Uncertainty in many aspects.

Optimization of energy bills	
The responsible entity and leading person	Goiener
The target group for the action	Citizens that get municipal grants to afford the cost of energy

Action design	Analysis of the electricity and gas bills of the citizens that have been identified by the municipality. In this case, preference is given to the ones that receive grants to cover the energy consumption. Electricity and gas bills will be analysed to identify improvement options, and concrete improvements will be carried out when necessary. In addition, improvements of the energy use and the energy efficiency will be also carried out in the respective households.
Scheduling	During 2023 and after.
Budget	10,000 €
Drivers	Regional energy plan that includes the mitigation of energy poverty, and the proactivity of the regional administration.
Barriers	Multi-level coordination. Administrative procedures. Obtaining all of the necessary information from the beneficiary citizens.

Support to energy communities in alleviating energy poverty	
The responsible entity and leading person	Goiener
The target group for the action	The energy community Enherkom
Action design	One of the first activities of the energy community is to provide advice and support about energy-related aspects to the citizens. That will be done through their energy office, and special attention will be put on the most vulnerable citizens. Besides the support already given by Powerpoor, additional support will be given to the energy community, mainly through the tools and methodology to further support energy poor citizens in improving their situation, especially regarding their energy contracts.
Scheduling	2023 and 2024
Budget	TBD
Drivers	The municipal process “Hernani Burujabe” where energy is addressed through the energy community Enherkom, and its relation with other initiatives on the social field. Collaboration with the social services of

	the municipality, and the networks of local organisations working with the most vulnerable citizens.
Barriers	Limited (personal and economic) resources to carry out the action, and the workload of the involved participants.

Step 5: Monitor & Evaluate

One year after completion of the POWERPOOR project (or any other timeframe decided upon during the stakeholder consultations), the first monitoring & evaluation process will take place to see whether the roadmap's actions, and ultimately its vision, are being met.

Table 54 Spain Action-Specific Indicators

Indicator	Baseline (2022)	Target (date dependent on action)	Target achieved?
Number of shared experiences about energy communities that include vulnerable citizens.	1	5 (2024)	
Number of trained people in training courses for professionals in the social sector	-	80 (2024)	
Number of actions to improve the accessibility of grants and other support	-	5 (2024)	
Number of renovated homes	-	50 (2024)	
Number of households attended using online tools	3.000	4.000 (2024)	

Number of updated energy poverty indicators for the territory of Gipuzkoa	-	4 (2024)	
Number of people attended in energy offices	-	1.000/year	
Number of coordination networks at a regional level	-	1/region (2024)	
Number of participants in collective sessions with vulnerable citizens	-	50 (2024)	
Number of households participating in municipal shared self-consumption	-	2.000 (2024)	
Number of improved energy bills of vulnerable households	-	600 (2024)	
Number of Social and Solidarity Economy networks	-	1/region (2025)	
Number of renovated vulnerable neighbourhoods	-	1/municipality (2030)	

Table 50 tracks the progress of general energy poverty indicators leaning on the categorization provided by EPAH.

Table 55 Spain General Energy Poverty Indicators

Indicator	Baseline (2020)	Target and Date (Vision)	Target achieved?
Inability to keep home adequately warm	10.9 %	0 % (2050)	
High share of energy expenditure in income	15.3 %	0 % (2050)	
Low absolute energy expenditure (M/2)	10.3 %	0 % (2050)	
Arrears on utility bills	9.6 %	0 % (2050)	

Recommendations on how to implement the national roadmap

The above process have resulted in a national roadmap which has been co-created with a diverse group of stakeholders from the POWERPOOR National Stakeholder Liaison Groups. Following the national policy dialogues and consultations, partners can suggest additional recommendations to specific stakeholder groups on how the above-listed actions can be implemented. Recommendations are aimed at the following groups:

For Sub-National Governments

Simplify administrative processes and remove bureaucratic barriers in the support programmes for vulnerable citizens. Typically, vulnerable citizens cannot access to the existing programs due to different barriers such as lack of capacity for financing, very complex and specific forms for applying to the programs, etc.

Increase the public housing stock which is under the control of regional authorities, to increase the number of vulnerable citizens with more accessible and better living conditions.

Renovation of the public housing stock, with preference in the most vulnerable citizens.

Provide more resources for energy offices, and include energy poverty in the existing ones that do not address it.

Make grants conditional on improvement measures.

Support the creation of coordination networks in each region, to improve the communication between key actors and the proper development of the actions implemented by each of them.

For National Governments

Create a coordination network to gather key entities in the energy poverty field. This network could support the development of the national strategy of energy poverty, and work as a coordination entity in the relevant aspects.

Simplify administrative processes and remove bureaucratic barriers in the support programmes for vulnerable citizens to facilitate the procedures and accelerate their implementation.

Provide more resources for the renovation sector via specific funding programs, to improve the accessibility of the funding and to accelerate the renovation of the most vulnerable households.

Propose a new energy certification methodology which would consider the energy consumption, in order to have a more realistic information about each house.

Promote the Social and Solidarity Economy and financing schemes to support the local economy and the local/regional networks that would empower citizens and improve the conditions of the vulnerable communities.

Include via legislation energy poverty inclusion as an obligation for energy communities.

Legislate the progressive energy tariff. The energy tariff should take into consideration not only the incomes but the energy usage per capita, making more expensive the energy poor citizens that are over certain ratios and promoting energy savings.

Energy market could be much more regulated and public institutions should be relevant actors both in the generation and distribution of the energy.

For Civil Society

Establish networks for support and advocacy.

Promote awareness raising campaigns to inform and empower citizens.

For The Private Sector

Promotion of ethical companies (energy retailers etc.) that could consider tariffs depending on the incomes, or that consider energy poverty mitigation a goal. In most of the tariffs nowadays, energy companies give more preference to making profit rather than to providing with an economically more accessible service to the consumer, concluding on that the consumer is paying more than what they really need.

14. Outlook

The eight national roadmaps have compiled a tremendous amount of information on the current state of energy poverty mitigation efforts and developed specific actions together with a large and highly relevant group of stakeholders. Often endeavors such as this one, end up not being followed up once the funding runs out. The POWERPOOR National Energy Poverty Mitigation Roadmaps, however, have been specifically designed with exploitation and long-term uptake in mind. All partners have reported that the co-creation process has been taken up well and that there is a lot of interest to continue using these roadmaps as a basis for further energy poverty work in the countries. Due to their cyclical methodology, it is very easy for the roadmaps to be taken up again in the future and to be updated with new information on the new state of play. The same workshop tools can be applied to come up with new actions as well as indicators in order to respond the changes in contextual conditions in the future. Equally, all partners agree that the further maintenance of these roadmaps could (and should) be paid for by future projects (e.g., via EU or national funding sources). This work therefore has set the groundwork for more accelerated policy design in the coming years.