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Actions to Mitigate Energy Poverty
in the Private Rented Sector

DELIVERABLE 3.5
Report on the implementation of the ENPOR policies

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Authors: Altan Sahin, Kerstin Schilcher (AEA)
Florin Vondung (Wuppertal Institute)
Christos Tourkolias (CRES)
Anamari Majdandzic (DOOR)
Nanda Vrielink, Lenneke Kok (HU)
Annika Urbas (TREA)
Edoardo Pandolfi, Anna Amato (ENEA)

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EXECUTIVE SUMMARY

The ENPOR project implemented various initiatives across seven countries, each targeting energy poverty in the private rental sector and demonstrating significant outcomes during and/or after implementation. The approaches of the initiatives varied, emphasizing the importance of national context and the potential of diverse solutions in addressing energy poverty. The design and implementation of these measures was built on the collaboration with the Regional Energy Action (REACT) groups in the seven target regions of ENPOR (AT, DE, GR, EE, HR, NL, IT). The REACT groups consisted of relevant national stakeholders whose expertise could make an important contribution to the elaboration of the ENPOR initiatives and who could support them in their implementation.

This report describes the implementation of the ten measures and policies that were implemented within the ENPOR project. It dedicates a separate chapter to each target region and the measures implemented there. In these, the conditions of the political framework in each country, in connection with energy poverty, especially in the private rented sector (PRS), are described in more detail, while changes that have occurred in this area since the start of the project are also described. This is followed by a description detailing originally planned implementation strategies for the policies or measures during the start of the project. ENPOR initially involved a comprehensive co-creation process with the respective national REACT groups in each target region, through which the measures were adapted or new ones were developed over the course of the project to better support energy poor households in the private rented sector. A detailed description of the work done through close cooperation in the REACT groups during the project is described in Deliverable 3.4.

The adjustments to the originally planned measures resulting from the REACT groups are also briefly summarised for each one in the respective chapters. This is followed by a description of the implementation processes for the individual measures. Finally, the specific risks and challenges in the implementation of the various measures in the target regions are elaborated as well as the results achieved and the lessons learned.

The work carried out in the seven EU Member States concerned has shown that the situations in the individual countries differ with regard to the political framework conditions. In some countries, the focus has been on implementing large-scale programmes to promote retrofits in vulnerable households, while in others the focus has been more on counselling and behaviour change. At the same time, there are also differences in the targeting of energy poverty across countries, as there are some measures that specifically address it, while others address low-income households more generally. However, the importance of targeted measures has increased as the energy crisis caused by the Russian war of invasion in Ukraine has put significantly more households at risk of energy poverty and the issue is now also higher on the political agenda. Despite this, the particular challenges within the private rental sector are usually not specifically addressed.

Throughout the ENPOR project, it has been observed that the related challenges are often similar in many countries (e.g. no definition of energy poverty, difficulty identifying affected households in the PRS even though this is potentially the most affected residential sector).

Overall, the ENPOR project highlighted the importance of tailoring energy poverty mitigation strategies to local contexts, involving a broad range of stakeholders, and focusing on both financial interventions and behaviour changes.

1 INTRODUCTION

Energy poverty is increasing in the private rented sector (PRS) in many countries, which presents quite specific issues:

a) The difficulty to identify and quantify energy poor households in the PRS

b) Structural problems, like information deficits, split incentives and others, making the delivery of energy efficiency measures to these households difficult.

The ENPOR project aims to overcome both challenges – making energy poverty in the PRS visible and as far as possible, quantifiable, while also testing energy efficiency support schemes to address the issue. This can increase the effectiveness of policies at local or regional levels, and aid in the alignment of structural measures. Dedicated actions are therefore needed that actively contribute to alleviating energy poverty in the PRS by identifying energy poor tenants (and respective homeowners) as well as understanding and addressing their needs. To this end, ENPOR supported the adaption and implementation of ten policies/measures in seven EU Member States tailored to the specific needs of the PRS and aimed to integrate them into broader policy objectives.

ENPOR supported the design and implementation of national policies and measures tailored to the specific characteristics of the PRS, considering the needs of tenants and property owners. The main objectives of the project were the following:

1. Deepen the understanding of energy poverty policies for the private rented sector.
2. Monitor dimensions of energy poverty in the private rented sector.
3. Support the set-up and implementation of energy efficiency policies and measures to alleviate energy poverty in the private rented sector.

Table 1: Overview of the ENPOR policies and measures

Country	Name of Scheme
Austria (AT)	Low-threshold, target group-specific consulting
Austria (AT)	Development of a concept for structural energy poverty mitigation measures
Germany (DE)	Heating related energy advice
Germany (DE)	Pre-paid metering EnergieRevolte
Estonia (EE)	National reconstruction grant
Greece (GR)	Energy Efficiency Obligation Scheme (EEOs)
Greece (GR)	Energy upgrade of buildings
Croatia (HR)	National Programme for Renovation of Buildings
Italy (IT)	Training and Information Campaign
Netherlands (NL)	Energybox

This report aims to provide a clear overview of the contents of the individual ENPOR measures, their changes within the framework of the project and a description of the implementation in the respective national contexts. As such, the following chapters describe in more detail both the implementation steps and the results from the implementation as well as the associated lessons learned from each ENPOR policy/measure, the framework conditions in each country, and the associated risks and challenges.

2 IMPLEMENTATION OF ENPOR POLICIES AND MEASURES IN AUSTRIA

2.1 National policy framework in relation to energy poverty, especially with regard to the private rental sector, and changes since the start of the project

In the energy law packages of 2003 and 2009, EU legislation considered consumer protection as an integral part of liberalisation while corresponding measures in favour of vulnerable customers were believed to be indispensable for the deepening of the internal market for electricity and natural gas. The 2018 energy package made a clearer distinction between low-income customers in need of protection and households affected by energy poverty.

With the implementation of the EU requirements, Austria implemented a wide range of consumer protection measures that also benefited vulnerable customers and contributed to the reduction of energy poverty. These measures largely corresponded to those of other EU countries: acute assistance such as basic supply and partial disconnection protection, cost caps, measures with a preventive effect such as prepayment meters, and information and advice.

All EU Member States had to submit their national energy and climate plans for the period 2021 to 2030 to the European Commission by the end of 2019, which also included a description of measures and plans to combat energy poverty. Despite this, in Austria, there is still no official definition of energy poverty at the political level. Although various definitions have been elaborated by different bodies, none has yet been included in the official political discourse. In the elaborated definitions of energy poverty, a very low household income and disproportionately high energy costs are the two most important factors. The energy efficiency of buildings and dwellings as a third factor has also become increasingly important. This is particularly relevant as people with low household incomes can often only afford housing that is in need of refurbishment.

Relevant measures envisaged in the government programmes since 2013 were implemented, especially in regards to the contact and counselling centres of the energy providers as well as a bundle of institutionally coordinated assistance and support measures, in particular for cases of hardship and emergency. However, the planned development of a master plan to combat energy poverty did not take place.

When implementing energy efficiency measures in the private rented sector, Austria also faces major challenges for energy poor households. Split incentives pose a major problem due to the legal situation in which tenants cannot influence the heating technology used within their households, although flat owners do not have full control over this decision either.[1] The lack of financing can also be a major hurdle; in many houses, there are too few reserves or disposable income.

Rents in many old buildings (or all buildings that fall under the full scope of the Tenancy Act) are

[1] Ashby et al. (2020), “Who are Hard-to-Reach energy users? Segments, barriers and approaches to engage them”, https://userstcp.org/wp-content/uploads/2020/10/Ashby-et-al-2020_ACEEE-summer-study.pdf

also subject to an indicative rent which reduces the incentive for landlords to invest here, although surcharges and deductions on the rent are also possible (usually, however, there are mostly surcharges by landlords). For this reason, an amendment to the Condominium Act came into force in 2022, which prescribes a minimum reserve of about 90 cents per square metre of floor space per month and also makes it easier to pass resolutions in the owners' association. Tenants cannot, however, de facto enforce a heating system exchange or similar actions themselves.

This is particularly relevant because a CO_2 tax has been introduced in Austria in October 2022, but it is precisely those who cannot switch to renewable energy sources who will have to pay it. It thus carries the risk of imposing a heavier burden on energy poor households in housing in need of renovation. Section 4 of the Tenancy Act does provide that a majority of the tenants of a building can demand that the landlord carry out “useful improvements” to the building (e.g. a district heating connection is explicitly mentioned in the law). However, this only applies if the investment can be covered from the rent reserve or if the tenant and landlord agree on how to share the additional costs. It is usually difficult to get such a majority – which is partly due to the high number of fixed-term tenancy agreements. Such greening of tenancy law has been discussed for years and can also be found in various earlier government programmes. Even now, a broad discussion process on this topic is planned at the political level, but it has not yet begun. The government also plans to adopt a phase-out plan for fossil fuels, with mandatory replacement of oil and gas boilers. However, the Renewable Heat Act, in which this is to be enshrined, has not yet been finalised.

The Russian war of invasion in Ukraine and the associated rapid price increase on the energy markets in 2022 have also led to a noticeable increase in the burden on the population in Austria, especially for those with low incomes. The Austrian government has implemented various measures to relieve the local population in this situation, for example in the form of various one-off payments.

In this process, various measures have also been taken that are specifically aimed at supporting energy poor households. These are briefly described below.

- **Clean Heating for All**: This subsidy scheme supports low-income households in switching from fossil-fuelled space heating systems to sustainable climate-friendly heating systems. Up to 100 % of the costs of the heating conversion are covered (with a cost cap). Energy advice for households is also provided. Building owners of a one/two-family house or terraced house who can prove their social vulnerability (e.g. by receiving certain social benefits) are eligible for support. This program serves as a first step to enable energy poor households to convert their heating systems and focuses only on building owners, as implementation in the rental sector would be significantly more complex.

- **Housing Umbrella**: This public support service is aimed at low-income private households. Households that are in arrears with their rent and are threatened with eviction can receive financial support here.

    - They receive free financial and social counselling and the arrears are paid for them.

New since 2023 is the Energy Housing Umbrella. Through this support service, arrears on energy bills are now covered to prevent vulnerable households from being disconnected from energy supplies. This benefit is also linked to advice for households on living aspects and energy costs.

- **Appliance replacement programme for households**: Under this new programme, the replacement of old inefficient household appliances, such as refrigerators, dishwashers and washing machines, is subsidised at 100 % for energy poor households. Households also receive low-threshold energy advice (so-called Social Energy Advice), during which a decision is made on whether appliances are worthy of replacement and which is intended to help reduce energy consumption in the long term. Social counsellors trained for this purpose can also provide this form of advice.

- **Social Energy Advice**: This new concept of energy advice was elaborated by the Austrian Energy Agency (AEA) in 2022. Social advisors are trained to provide low-threshold energy advice to vulnerable households. The focus is on topics that can help to reduce energy consumption without investments and also help with problems in paying energy bills. The training participants receive introductions to the topics of electricity, heating and hot water and learn from experts the most important recommendations for households to be able to make their energy consumption as sustainable as possible. They also learn where the most common problems of energy poor households lie and what the causes are. By combining their knowledge from the social sector with new knowledge from the energy sector, they are ideally suited to support energy poor households.

ENPOR was able to contribute to these instruments in various ways during the implementation of its measures. The specific contributions of the project and the implementation steps are described in the following sections.

2.2 Low-threshold, target group-specific consulting – AT

2.2.1 Description of the measure prior to the ENPOR co-creation process

In Austria, various support services are in place to help low-income households to reduce their energy consumption and related costs and to make it more sustainable. These services range from on-site consultations to various information materials. However, the existing information and support formats are often not prepared in a suitable form, as this target group(s) often do not have the time and resources to deal with sophisticated tools and detailed materials and usually energy poor households are not specifically targeted either. Therefore, co-designing and implementing measures that benefit energy poor tenants in the private rented sector in Austria is the core of ENPOR and this behaviour change intervention.

The energy consumption of households in the private rented sector is largely dependent on factors that are outside the tenants' direct sphere of influence (e.g. thermal condition of the building). Nevertheless, the tenants themselves have the opportunity to improve their living situation, at least to a certain extent. Therefore, the need for solutions for energy poor households to be easy

to implement and to be cheap is an important basis for the elaboration and implementation of this measure to reduce their energy consumption or energy costs. Many energy poor people already save energy, but often try to do so by sacrificing living comfort. This can also be counteracted by selecting suitable measures.

Within the framework of the project, new formats have therefore been created through which energy poor households in Austria can be supported in a more targeted manner. The aim was not to create duplications, but rather to complement the existing offer of support by further developing what is already available. For this purpose, a cooperation with DIE UMWELTBERATUNG, which has been offering energy counselling for energy poor households in the target region of Vienna for many years, was entered into. Together, within the framework of the co-creation process in the REACT group, the concrete measure that would bring the greatest added value to advisory services for affected households has been worked out.

2.2.2 Changes to the measure resulting from the co-creation with the national REACT group

The work in the REACT group, with a close exchange with DIE UMWELTBERATUNG, has led to the decision to revise already existing information materials on various topics of energy saving in the household and to create new versions within the framework of ENPOR. However, these materials are intended to stand out from previous offers at this level by placing a clear focus on figurative language, thus offering a clear advantage for this hard-to-reach target group by conveying information with as few words as possible and a clear focus on illustrations and pictograms. This serves the purpose of making it easier to overcome linguistic hurdles or hurdles resulting from a lack of background knowledge. Although this measure brings benefits for energy poor households in general, it plays a particularly relevant role for those in the private rental sector, as those affected there can often only bring about energy savings or energy cost reductions through behavioural changes, as they lack the funds for investments and also the decision-making authority for more comprehensive measures as non-owners. This is also relevant insofar as the building stock in the private sector is on average less energy-efficient than in the social housing sector.

When developing such services, it is crucial to include the target group of the concerned households. However, this is usually a big challenge, because on the one hand, there is of course the problem of identifying energy poor households and gaining access to these households. In the REACT group, it was therefore also worked out that the involvement of the households would take place via the energy advisors of DIE UMWELTBERATUNG as intermediaries. The developed materials were used by them in a pilot phase in their ongoing counselling to obtain direct feedback from energy poor people and to involve them in the development process. In total, 50 energy poor households were advised in this pilot phase with the help of the newly developed materials in order to obtain their feedback. It became apparent that the focus on figurative language was much better received by the target group and led to noticeably more interest in the information materials compared to older text-heavy materials.

The feedback from the advised households was extremely positive, only for individual points were the intended messages not immediately comprehensible. After the pilot phase, therefore, only

minor changes were made to some of the illustrations to make them even clearer.

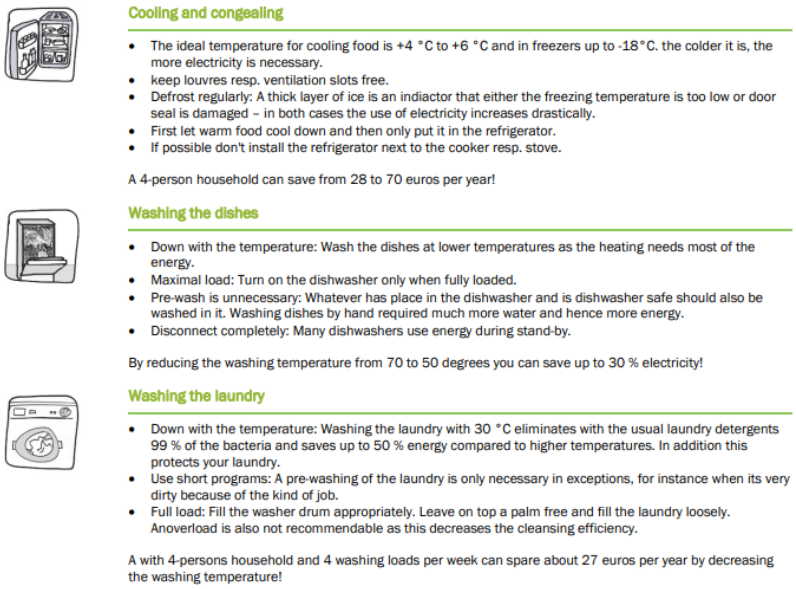
After this pilot phase in counselling, the materials were sent to several social organisations and MA40 of the City of Vienna (Municipal Department of Social Affairs) via the network of AEA and DIE UMWELTBERATUNG to get their feedback as well. No further requests for changes were made, as the design and the focus on providing accessible information to the target group were very positively received. Several organisations directly asked to use the newly developed material themselves. Representatives of the energy sector and the Austrian Chamber of Labour also rated the new materials as very well done.

Feedback was also requested within the REACT group of the second Austrian ENPOR measure, as this group mainly comprised representatives from the political and administrative level, in order to also take their opinions into account. But here, too, it became apparent that the newly created material was very positively received and that no further changes were necessary.

A comprehensive description of the entire working process with the REACT group can be found in ENPOR's Deliverable 3.4.

2.2.3 Description of the implementation process

The central element for the implementation of the measure was the development process for the new information and counselling materials. This process was conceived as an ongoing co-design process between the Austrian Energy Agency and DIE UMWELTBERATUNG. The content of the new information and counselling materials is based on existing information sheets from DIE UMWELTBERATUNG, which already used them for its counselling services before the beginning of the project. The following graphic shows an exemplary excerpt from a paper on the subject of household appliances.



Cooling and congealing

- The ideal temperature for cooling food is +4 °C to +6 °C and in freezers up to -18°C. the colder it is, the more electricity is necessary.
- keep louvres resp. ventilation slots free.
- Defrost regularly: A thick layer of ice is an indiactor that either the freezing temperature is too low or door seal is damaged – in both cases the use of electricity increases drastically.
- First let warm food cool down and then only put it in the refrigerator.
- If possible don't install the refrigerator next to the cooker resp. stove.

A 4-person household can save from 28 to 70 euros per year!

Washing the dishes

- Down with the temperature: Wash the dishes at lower temperatures as the heating needs most of the energy.
- Maximal load: Turn on the dishwasher only when fully loaded.
- Pre-wash is unnecessary: Whatever has place in the dishwasher and is dishwasher safe should also be washed in it. Washing dishes by hand required much more water and hence more energy.
- Disconnect completely: Many dishwashers use energy during stand-by.

By reducing the washing temperature from 70 to 50 degrees you can save up to 30 % electricity!

Washing the laundry

- Down with the temperature: Washing the laundry with 30 °C eliminates with the usual laundry detergents 99 % of the bacteria and saves up to 50 % energy compared to higher temperatures. In addition this protects your laundry.
- Use short programs: A pre-washing of the laundry is only necessary in exceptions, for instance when its very dirty because of the kind of job.
- Full load: Fill the washer drum appropriately. Leave on top a palm free and fill the laundry loosely. Anoverload is also not recommendable as this decreases the cleansing efficiency.

A with 4-persons household and 4 washing loads per week can spare about 27 euros per year by decreasing the washing temperature!

Figure 1: Example from one of the old information sheets for energy poor households on appliances

These older materials are available online in several languages in different editions on various topics of energy consumption in the household (electricity, heating, ventilation, etc.) and were used for consultations for socially disadvantaged and energy poor households.[2] The content of the materials is comprehensive and highly relevant to households, as they are relatively easy-to-implement actions that are usually free to relatively cheap to implement. However, they are quite text-intensive and therefore not always suitable for our target group(s).

It should be noted that many energy poor people are not digital natives (such as elderly people, of whom many women, in particular, are affected by old-age poverty). It is therefore important that the results can also be used well in physical form. Through the work in the REACT group, insight was gained that counsellors working with energy poor households have also seen the need for a revised range of materials for some time now. Unfortunately, there are often not enough resources to implement this.

For the cooperative design process for this measure, in principle, a separate small strand of the REACT group was formed, which was mainly concerned with bilateral coordination between the Austrian Energy Agency and DIE UMWELTBERATUNG. This involved ongoing coordination meetings and communication between the partners so that both sides could contribute their expertise. AEA contributed its expertise in awareness raising and behaviour change, especially in the context of energy efficiency, while DIE UMWELTBERATUNG contributed its practical experience and the actual realities, challenges and attitudes of the groups of people who suffer most from energy poverty.

The first step in this cooperative design process was to evaluate the existing materials and check the contents for their relevance and suitability for the target group. Technical details that are too in-depth and comprehensive can overwhelm or scare people who are not well-versed in this field. Therefore, when developing the new materials, the main focus was on actions and behaviours that are easy to implement by households and do not require major investments. After the evaluation of the existing information materials and the selection of topics in consultation with DIE UMWELTBERATUNG, the revised materials were divided into the following topics:

- Saving electricity
- Saving heating costs
- Protection from the summer heat and effective cooling

For the development, we have reduced the already available information material into easy-to-implement energy-saving tips which were broken down into only three thematic info sheets. This took place within the framework of several small workshops. The process is described in more detail in D3.4 of the project. The overarching theme and the respective topics dealt with are shown in the following table. Each of the topics in turn contains several easy-to-implement energy-saving tips.

[2] https://www.umweltberatung.at/gesund-wohnen-energie-und-wasser-sparen

Table 2: Thematic structure of the newly developed information and advisory materials

Factsheet	Topics covered
Saving electricity - it's that simple	Saving electricity in the kitchen
	Saving electricity in the bathroom
	Saving electricity in the living room
Saving heating costs in Winter	Efficient heating
	Proper ventilation
	Avoiding mould formation
Cool through the Summer	Protection from the summer heat
	Proper ventilation
	Avoiding air conditioning

After working out the contents for the new information materials, a first structuring and a rough design for the structure of the sheets for the later elaboration of the illustrations was made. Special emphasis was placed on conveying the selected messages with as few words as possible.

The next step was the concrete graphic elaboration of the defined content in the form of illustrations and pictograms. This was implemented by a professional graphic designer, whereby the entire elaboration process was closely monitored by AEA to ensure that the final product is suitable for the target group(s).

The first phase in this process was to “translate” the selected energy saving tips into illustrations in cooperation with the graphic designer. Coordination took place through regular meetings and continuous evaluation of the produced illustrations by the AEA in support of DIE UMWELTBERATUNG. The design was therefore always done step by step to allow for the most comprehensive quality assurance possible. In this process, AEA always created drafts of the factsheets and their contents as well as concepts for possible illustrations, which were then implemented step by step by the graphic designer.

The following graphic shows a first rough draft and should exemplarily show what direction the revision went in at the beginning, compared to the example of the old Infosheets from the previous illustration.

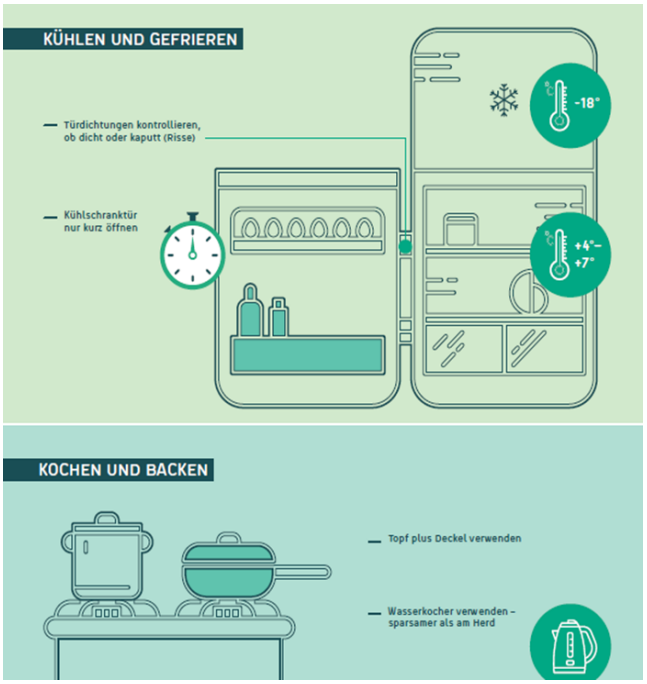


Figure 2: Example of a first draft of the new information materials for energy poor households

The individual factsheets were drafted one after the other, starting with the one on saving electricity.

The first drafts were always prepared in close cooperation between AEA and the graphic designer, as described above. As soon as the draft of one of the three factsheets was finalised, a joint workshop was held between AEA, DIE UMWELTBERATUNG and the graphic designer. This brought all the parties involved to the same table and enabled ideal creative work. AEA contributed its expertise in target group-oriented communication and energy efficiency, DIE UMWELTBERATUNG its experience from consultancy practice and the graphic designer her perspective as a professional designer. This enabled another very good evaluation process for the completed drafts, through which they could again be extensively checked for their relevance and clarity. After these workshops, the respective draft was adapted and finalised.

However, as already described, energy poor households are also to be directly involved in the development. This involvement is crucial to ensure the development of targeted interventions that meet their needs and challenges. Therefore, the developed materials were tested in a pilot phase directly in the counselling work of DIE UMWELTBERATUNG in the course of about 50 on-site advice sessions for energy poor households in Vienna, as the province in Austria with the highest proportion of people at risk of poverty. The feedback from the households advised in the pilot phase was extremely positive and the positive effect of the target group-oriented design of the new information and advisory material was clearly recognisable from the start and generated significantly more interest from their side than was previously the case.

As part of the evaluation process, care was also taken to ensure that households from the private

rented sector make up as large a proportion as possible of those energy poor households involved in the testing of the new materials. This enabled an evaluation process that ensures that the contents developed are clear, comprehensible and also of relevant nature for affected households.

After the implementation of the pilot phase, the materials were slightly adapted and finalised based on the feedback from the advised households. As described in the previous section, the final drafts were also shared with various stakeholders from the energy and social sectors through the REACT group to take their feedback into account. However, this did not result in any further need for adaptation. The illustration below shows the first pages of two of the three finalised factsheets that make up our newly developed information and advisory materials. The final design direction and form of information transfer are visible there.

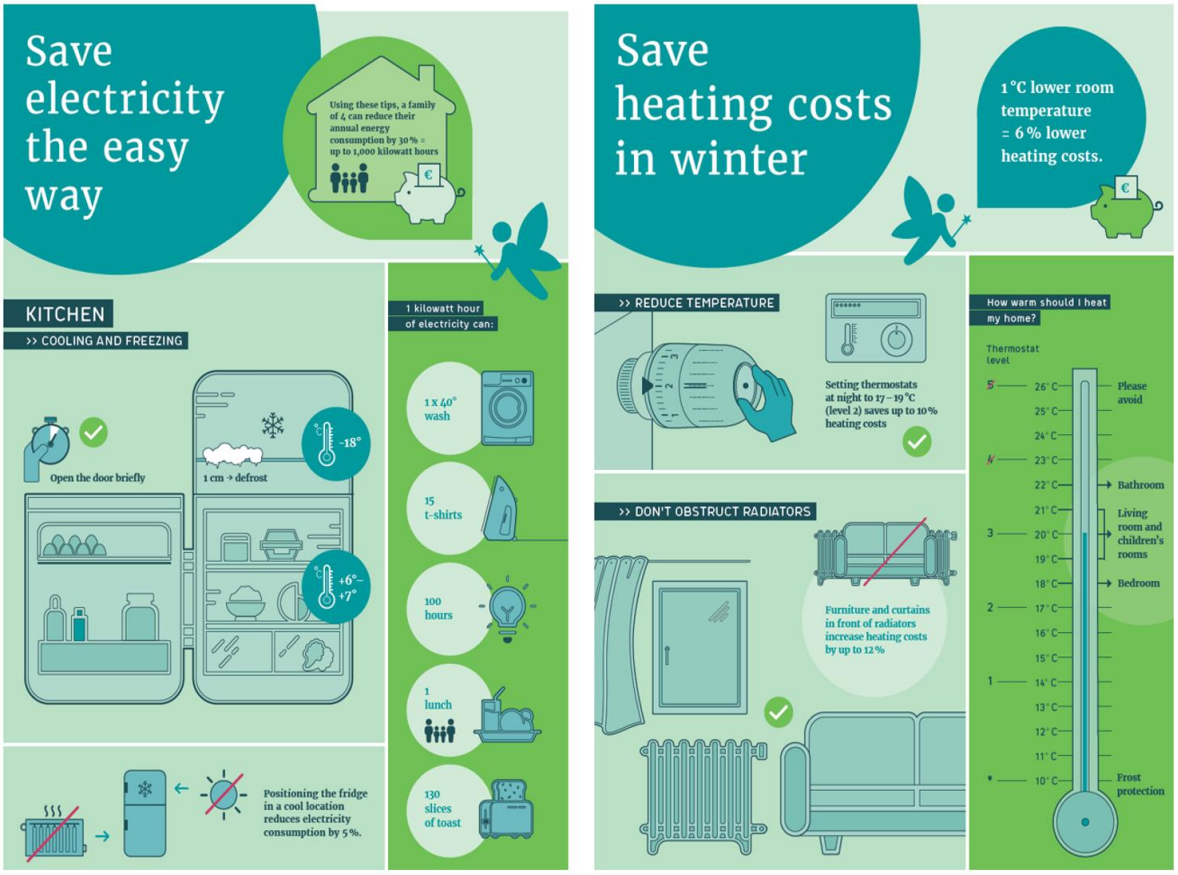


Figure 3: Exemplary excerpts from the developed information materials for energy poor households

After completion of the materials, they were also presented to representatives of the Ministry for Climate Action and the national climate protection initiative in Austria "klimaaktiv" within the framework of the national REACT group. They saw great added value in them and considered them to be very useful for the support of energy poor households. Therefore, they agreed to support the dissemination of the materials as much as possible for the widest possible use. The Ministry for Climate Action therefore financed, within the framework of klimaaktiv, the development of

translated versions of the materials in languages identified as particularly relevant for counselling energy poor households, and also the professional printing of a large volume of the materials in all languages, which are made available free of charge to counselling institutes and other organisations supporting energy poor households throughout Austria. In particular, organisations supporting households in the private rented sector, for example, the tenants' association, were prioritised and were the first to be provided with prints of the materials and to be re-supplied as needed.

The co-financing of the Ministry of Climate Action made it possible to translate the materials into five languages in addition to German: English, Turkish, Bosnian-Croatian-Serbian, Arabic, and Farsi. The translation was coordinated by AEA with a translation service.

After the completion of the translated versions, AEA tested them with native speakers of each language to ensure their comprehensibility and clear language. Afterwards, the new versions were also completed in all languages. All factsheets and language versions were also made available digitally free of charge on the ENPOR website.[3]

2.2.4 Role of the REACT group in the implementation

For the implementation of this measure, the REACT group had two main functions: (1) providing feedback from the participants' respective fields of expertise and (2) assisting in the dissemination of the results.

Two strands of the REACT group were used to implement the measure as described. The material was developed in close cooperation of AEA with DIE UMWELTBERATUNG and a graphic designer, who thus formed their own small REACT group. Feedback on the output was then sought from the broader REACT group consisting of relevant actors related to energy poverty, including e.g. the Ministry of Climate Action, the Chamber of Labour and also representatives from the social and energy advice sectors. The materials were then also distributed and promoted via this broad network. Close cooperation with the Ministry for Climate Action and klimaaktiv was particularly important here, as it was possible to agree that they would finance the translation into five other languages and the printing of a large number of copies of the materials. Advisory institutions thereby gained free access to digital and also printed versions of the developed material.

2.2.5 Risks and challenges in the implementation of the policy/measure

One of the key challenges in preparing the new materials was to ensure that they are suitable for the different demographic target groups that are particularly affected by energy poverty. There was a risk that the new materials may not be comprehensible or may contain information that is not particularly relevant to households in the private rented sector, and therefore may not be well received.

To counteract this risk, the implementation was being carried out in close cooperation with DIE

[3] https://www.enpor.eu/14-09-22-austrian-enpor-measures-in-the-energy-crisis/

UMWELTBERATUNG. Through their many years of work with energy poor households, they have gained comprehensive insight into the living conditions, problems and also wishes of the households concerned. Their continuous coordination and active involvement in the quality assurance of the measures ensured that the new materials are relevant to practice from the very first draft. To minimise the risk of lack of acceptance by the target group, the direct involvement of energy poor households in the pilot phase for testing the materials was also relevant. Active use in the consultation and feedback from the households themselves ensured that the underlying objectives were met, the new materials have the desired effect on energy poor people and represent real added value for them. In this context, it was also important to consider that the willingness to accept support services is also based on trust. Many people fear stigmatisation when taking advantage of support services and therefore sometimes even refuse direct financial support. It was therefore very important for the implementation to have a local partner on board in the form of DIE UMWELTBERATUNG, which enjoys a great deal of trust at this level due to its decades of work. In this way, we wanted to ensure that we meet the challenge of energy poverty as a multidimensional problem and do not see the whole challenge from a pure energy perspective, but can also take into account the social dimension and underlying problems.

Another challenge in connection with this measure was the acceptance of the materials by suitable multipliers, as direct transmission to households is not possible because of the difficulty of identifying them and then actually having access to the people. There is usually always a need for someone in the intermediary role (e.g. energy advisors, but also social aid organisations, etc.) to use and pass on these materials for assistance. It was therefore necessary to get them on board as well and ensure that there is also a use beyond the project. This also included landlords, who play a relevant role, especially for ENPOR. This involvement was ensured by the REACT group, where the materials themselves were shared to gather feedback from the members of the group and also for dissemination through their channels.

2.2.6 Implementation results and lessons learned

The development of target group-oriented information materials with a focus on figurative language shows a clear improvement compared to materials previously used that did not take into account the specific needs of population groups particularly affected by energy poverty. Both the feedback from relevant stakeholders such as energy advisors as well as from social organisations and political actors was extremely positive about the factsheets developed within the framework of the REACT group. The application in advice sessions for energy poor households and the feedback from affected households themselves underlined this once again, as the material was very positively received and a clear improvement could be noted compared to previous advice situations. The REACT group process and the close cooperation with the Ministry of Climate Action in Austria also enabled the translation of the material into five other languages than German (English, Turkish, Bosnian-Croatian-Serbian, Arabic and Farsi), further increasing its accessibility to key target groups.

The close cooperation with relevant stakeholders from the policy and administrative levels also made it possible that the developed materials have now become part of important advisory offers

nationwide. The newly developed information and advisory materials are a fixed component of the Ministry of Climate Action's programmes and instruments to support energy poor households described in section 2.1.

They are used in the energy advice for energy poor households in the support programme Clean Heating for All and in the appliance exchange programme for energy poor households. The appliance exchange programme in particular plays an important role in the private rental sector, as it enables households there to at least exchange inefficient appliances with efficient new appliances. Through the associated obligatory energy advice, the materials can directly reach the target group and further increase the quality of their support.

In the Social Energy Advice training, the materials are also made freely available to the participating social counsellors and energy counsellors so that they can use them directly in their advice sessions for energy poor households.

Through the REACT group of the second Austrian ENPOR measure (see next section), it was also possible to establish contact with representatives of the Ministry of Social Affairs in order to cooperate more closely with it as well. This made it possible that the materials developed in the framework of ENPOR are now also used in the consultations of the Housing Umbrella to support energy poor households. The housing umbrella is a very important instrument in Austria to support households in the private rental sector and is very often used by vulnerable households from this segment to get support in case of arrears.

At the time of this report, about **130,000 factsheets** have already been printed and distributed to relevant institutions in Austria to be used in counselling and to be made available to energy poor households. The developed material has thus become an important part of relevant support services for energy poor households in Austria. It is already being used extensively throughout the country and this will continue beyond the project duration. Due to the high demand, an additional factsheet on water saving is currently being developed in ENPOR, and translations of all materials into Ukrainian and Russian are planned as additional languages, as demand for this was frequently reported by the advisory services. For these two measures, too, co-financing by the Ministry of Climate Action was made possible by the AEA due to the success of the materials, in order to enable implementation.

ENPOR has thus made a significant contribution to better supporting energy poor households in Austria, especially in the private rental sector, as they can currently control their energy costs primarily through their consumption behaviour and their counselling and support were also improved nationwide beyond the project through the developed material. The use of figurative language to communicate energy-related information to vulnerable households has proven to be of great added value and should also be considered in future interventions in other settings.

2.3 Development of a concept for structural energy poverty mitigation measures – AT

2.3.1 Description of the measure prior to the ENPOR co-creation process

At the beginning of the project, a support volume of several million Euros as part of a comprehensive renovation offensive by the Austrian government was intended to enable low-income households to cope with additional burdens arising from the implementation of renovation investments in the building sector eligible for funding under support programmes, thus reducing investment barriers in this segment of the population. The European Union's Recovery and Resilience Facility also made additional funds available, part of which is used specifically to support energy poor households in Austria. These funds were used over the course of the project to launch the Clean Heating for All programme and the appliance replacement programme for energy poor households.

Since the Austrian Energy Agency was not directly involved in the implementation, as it was delegated to other organisations (the Federal Provinces and the Climate and Energy Fund), it was decided to work out new proposals for measures to alleviate energy poverty in the private rented sector in the framework of the REACT group in consultation with relevant public representatives from the ministerial level, in order to provide a possible basis for new policy instruments.

2.3.2 Changes to the measure resulting from the co-creation with the national REACT group

The original measure (financial support scheme for thermal refurbishment measures for low-income households) changed because the implementation and responsibility were completely handed over to other bodies in Austria preventing AEA to participate.

During the REACT group meetings and the close exchange with the Ministry of Climate Action, it became clear that policy proposals for structural measures are needed, which can help to build the foundation to support energy poor households in a more targeted way. For this purpose, AEA developed a concept for structural energy poverty mitigation measures in Austria, through which different activities can be implemented so that a better basis for decision-making can be created and synergies can also be used more strongly. It includes several proposed activities that are built on the following pillars:

- Establishment of a decentralised advisory service
- Quality assurance of advice services
- Training and further education for both energy and social advisers
- Key stakeholder participation
- Data collection and monitoring
- Establishment of a central contact point

2.3.3 Description of the implementation process

Since the implementation of the first REACT group meetings in Austria in 2021, this has led to a closer exchange between the Ministry of Climate Action and the Austrian Energy Agency, in which

the AEA has been continuously involved in various ministerial working groups, in which the current situation regarding energy poverty was also discussed. This cooperation served as the implementation of the REACT group in Austria for the second measure, in which targeted measures could be developed and elaborated at the ministerial level.

For this purpose, a smaller working group was formed at the Ministry, consisting of various departments (national climate protection programme klimaaktiv, energy efficiency, environmental subsidies, staff unit for communication) and the Austrian Energy Agency, which held regular meetings and workshops to discuss the proposals developed by the ENPOR team.

Within the framework of this closer cooperation and the energy crisis in 2022, it became apparent that there is a need to develop new measures for policymakers that do more justice to the challenges and causes of energy poverty and counteract its emergence.

The Ministry of Climate Action, therefore, asked AEA in the spring of 2022 to develop a concept for the targeted implementation of structural measures that can support energy poor households, especially in the private rental sector, which is also the biggest challenge due to the legal framework, and alleviate energy poverty.

To this end, the Austrian Energy Agency worked out various possible measures that could help to combat energy poverty in Austria more strongly at the structural level. The starting point for the development of our policy proposals was the recognition that energy poverty is a pressing issue affecting a complex and diverse target group. Households suffering from energy poverty often face numerous challenges. Energy often is not a priority in these situations, and those affected tend to plan and act on a short-term basis. Existing support measures often do not reach these households adequately, as they are not suitably prepared. As tenants, they often lack decision-making freedom, and there is a lack of financial means and knowledge about subsidies. Furthermore, the current price development is expected to push even more households into energy poverty. Therefore, there is an urgent need for support and prevention measures that are appropriate for the target group. Consultations are the central support offer in this context.

Initially, these proposals aimed at strengthening the exchange between the energy and social sectors in Austria, especially between social and energy advice, enabling more evidence on energy poverty and establishing related monitoring structures, as well as enabling the exchange of relevant stakeholders at different decision-making levels. These initial proposals for measures were presented to and discussed with representatives of the Ministry of Climate Action. Based on feedback and input that AEA had received from representatives of the ministerial level, the ENPOR team revised its concept with the various proposed measures. Following this revision, six fundamental policy proposals were developed for the ministerial level to combat energy poverty on a structural level in Austria. The following is a brief overview of the individual proposals that were developed within the framework of ENPOR:

1. **Establishment of decentralised consulting services**: Traditional, one-off counselling is often not enough to adequately support vulnerable households and lead to long-term

improvements. Consultation for energy poor households should be seen more as a form of accompaniment that supports those affected in solving their problems. Locally based support institutions often already know who is in a social hardship case and would need more support, but they lack the resources to provide this support themselves. Therefore, it would be helpful to establish consulting services at the local level and support those institutions that already have access to the target groups. For this purpose, sufficient financial resources would need to be provided sustainably and systematically. This could be done, for example, through a tendering process through which support institutions that meet the criteria receive additional resources to support energy poor households on site. In particular, smaller organisations should also be able to receive support in order to really start at the local level and to enable support directly in various forms.

2. **Training and further education for both energy and social advisors**: Specific further training courses are needed for advisors. Social workers and energy advisors need new further training courses tailored to energy poor households to enable effective care and support. Training offers for different qualification levels and target groups should be developed and nationally established, to enable a targeted addressing of the problem. Here, social workers should be trained mainly on energy topics, such as energy saving in the home and energy billing, while energy advisors should gain knowledge on working with vulnerable households, as these are usually not their target group for energy counselling.

   An essential part of this education and training should be the involvement of representatives of the target groups. People who have an understanding of the cultures and languages of origin of relevant target groups can enrich the efforts and act as voluntary coaches. This enables a deeper and more authentic interaction with the affected communities and can help increase awareness and understanding of energy poverty and possible solutions. In particular, women with a migration background can be empowered through this involvement and take on essential roles in advising and supporting energy poor households. This integrative and participative approach can help increase the scope and effectiveness of measures to combat energy poverty.

3. **Quality assurance of advice services**: The new consulting services must be of high quality to be successfully established. Minimum requirements for consultants in the new consultation model would need to be defined, and continuous training should be ensured. In addition, prevention work should be at the forefront to help those affected avoid emergency situations. A special focus of the new trainings should therefore be placed on this.

4. **Data collection and monitoring**: To effectively combat energy poverty in Austria, a continuous monitoring system could be developed and established. This could be achieved by developing suitable indicators and cooperating with statistical institutes in Austria, such as Statistics Austria. The development of such indicators can also support the official definition of energy poverty in Austria and make it possible to assess its manifestation in the long term and also to evaluate implemented measures.

5. **Participation of key stakeholders**: An effective approach to combating energy poverty would be to use existing sector-specific exchange processes and cooperate with partners from the federal and state level as well as the social and energy sector. By sharing updates on current developments in connection with energy poverty, measures can be further developed in a continuous process. It could also be helpful to organise a specific stakeholder dialogue on the subject of energy poverty to deepen awareness and understanding of the problem.

6. **Establishment of a central contact point**: A central contact point would be particularly helpful for actors who want to support energy poor households. This contact point could be used to provide stakeholders with information on available means that can help energy poor households.

By setting up such an offer, they could gain easier access to relevant information (e.g. on available subsidies etc.) and be referred to suitable contact points for complex issues. In this way, the problem can be countered at the regional level, individual actors often lack an overview of all existing support instruments and therefore do not know, for example, that there are already specialised support services for certain problem situations.

In conclusion, combating energy poverty requires a coordinated and multidimensional strategy tailored to the specific needs of the affected households. By implementing these measures, Austria could take a significant step towards reducing and ultimately eliminating energy poverty.

The implementation of the measures was continuously discussed in further meetings of the REACT group and a concrete result has already been achieved. Based on the underlying considerations of the Austrian Energy Agency, the Social Energy Advice[4] described in section 2.1 was set up in 2022. This stems from the considerations of the concept from point 2, the development of new training and further education formats for advisors from the social and energy sectors. The new training for Social Energy Advice started in October 2022 and has a modular structure. The training is funded under the national climate protection initiative klimaaktiv and implemented by AEA.

The ENPOR team supported the preparation and implementation of the first module and the preparation of related documents. In the first module, social advisors are trained to provide low-threshold energy advice to vulnerable households. The focus is on topics that can help to reduce energy consumption without investments and also help with problems in paying energy bills. The training participants receive introductions to the topics of electricity, heating and hot water and learn from experts the most important recommendations for households to be able to make their energy consumption as sustainable as possible. The information and counselling materials developed in ENPOR are also made available to all participants so that they can use them in their counselling sessions. Furthermore, the ENPOR team designed the second module of the training, which focuses on energy billing for electricity, gas and district heating. The ENPOR team organised that the training sessions are conducted by experts from E-Control (regulatory authority) and the Chamber of Labour. The second module covers the relevant legal situation, the structure and

[4] https://www.klimaaktiv.at/bildung/weiterbildungen/management_beratung/soziale-energieberatung.html

function of energy bills, consumer protection aspects and common challenges for households. While the first module focuses on social workers as the target group, both social and energy counsellors participate in the second module. By embedding the training in klimaaktiv, it was possible to continue offering it on an ongoing basis and thus establish it as a long-term solution that can improve the counselling of energy poor households. This is particularly relevant for households in the private rental sector, as they can often only really influence their energy consumption through their own behaviour. Targeted counselling to take into account not only more efficient energy consumption but also social aspects and to enable a better quality of life is thus an important structural prerequisite to support households in the private rented sector.

These activities also resulted in AEA being able to participate in a second ministry-level working group on energy poverty, which formed another strand of the REACT group. Since autumn 2022, there has been a regular exchange on energy poverty between the Ministry of Climate Action and the Ministry of Social Affairs in Austria in the form of an exchange meeting once a quarter. Due to the continuous cooperation of the Austrian Energy Agency with the Ministry of Climate Action in the REACT group, AEA was also invited to these meetings which all take place in person. The participants use these meetings to coordinate their activities more closely and to use possible synergy effects between the two sectors. Another aim is to provide participants with a more complete picture of what measures are being implemented in Austria to support energy poor households, as there is often no comprehensive information available on each other in the different resorts or sectors.

Participation in this working group enabled AEA to present the developed information and counselling materials directly to representatives of the Ministry of Social Affairs. They also found them very useful for the target group and asked to be allowed to use them in their counselling sessions nationwide. The Ministry of Social Affairs ordered a total of approx. 100,000 copies of the developed factsheets (incl. translations) due to these exchange meetings, which are to be distributed directly to counselling institutions in order to be able to use them in counselling sessions and directly pass them on to energy poor households, especially from the private rental sector.

In spring 2023, AEA organised several exchange meetings with representatives from the counselling sector of social institutions to exchange ideas with them on possible suggestions for improvement and also to obtain feedback directly from them on where they have the greatest challenges in practice and how they could be supported in overcoming them. During these discussions, the AEA was able to gather valuable input for the policy level and also received very positive feedback on the developed advisory materials and training for Social Energy Advice. Both were seen as valuable support for assisting energy poor households.

2.3.4 Role of the REACT group in the implementation

The REACT group focused mainly on exchanges with representatives of the Ministry of Climate Action and later also with representatives of the Ministry of Social Affairs. The main focus was on presenting the AEA's policy proposals and obtaining feedback and input from them. The general situation regarding energy poverty was also discussed and ongoing updates on new developments were provided. The REACT group therefore took the form of an ongoing working group with regular

meetings, which ultimately enabled the developed project outputs to be directly introduced at the ministerial level.

2.3.5 Risks and challenges in the implementation of the policy/measure

Many policy measures implemented to support energy poor households are not directly targeted at them, but rather serve to support low-income households in general.

This is also often purely financial support, which may help in the short term, but only tackles the symptoms and does not directly contribute to tackling the causes of energy poverty.

The development and implementation of new measures at the structural level is a lengthy and difficult process that also depends very much on the current political framework conditions. Access to relevant stakeholders is crucial to provide the impulse for new solutions.

In the case of the implementation of new measures, there is also the fact that identifying energy poor households is still a challenge, especially since there is still no official definition for them in Austria. Furthermore, there is currently no focus on tenants in the current policies.

2.3.6 Implementation results and lessons learned

Based on the project results, it can be concluded that there is great interest in combating energy poverty in Austria more strongly at the structural level, but the implementation of suitable measures requires a lot of lead time. The proposal developed in the project with the six pillars, which represent a basis for further measures, is a good foundation on which policy can build. Some of the things suggested in the proposal have already been implemented in a modified form with the help of the Austrian Energy Agency, such as the Social Energy Advice as a training of social counsellors on energy issues, so that they can expand the network of potential low-threshold counselling on energy issues, especially at the local level.

So far, around 200 counsellors have already participated in the training of the first and second modules. A third module is also planned, but this will be organised locally in the individual federal states. The trainings will be continued on an ongoing basis and by embedding them in the national climate protection initiative klimaaktiv, their long-term implementation can be ensured. With its policy concept, ENPOR has made a significant contribution to creating a new service in Austria that improves targeted advice and support for energy poor households in the private rented sector. The Social Energy Advice also offers great potential to be implemented in other countries in a similar form and should be further disseminated as a measure.

Furthermore, the proposals of the AEA were used as inputs in the current work of the Ministry of Climate Action on energy poverty. The close working process enabled ENPOR to provide input directly to the relevant actors for policy development. In spring 2023, a new energy efficiency law, the so-called Energy Efficiency Reform Act 2023[5], was drafted at the political level. This draft law

[5] https://www.parlament.gv.at/dokument/XXVII/I/2036/fname_1559041.pdf

also included a new energy poverty coordination office to be established. It also defined the tasks of the coordination body, which partly also corresponded to some of the proposals of the AEA in a modified form. The proposals could thus also have an input into current policy development processes. However, the law is currently still being discussed politically in the National Council and has not yet been passed. It is therefore not yet possible to determine whether the energy poverty coordination office will be introduced in this form or not.

For the possible future implementation of the proposed activities, a bundled implementation is to be seen as expedient, as this would enable better coordination and synergy effects between the individual pillars of measures that could be better utilised. The Austrian Energy Agency will continue to work to facilitate a possible bundled implementation of these measures in the ongoing working groups and ministerial meetings. In any case, the close cooperation in the REACT group has proven to be effective in implementing measures and also in opening up new possibilities for implementation and cooperation. However, policy formulation is subject to uncertainty even under these circumstances, as implementation depends on many other factors at the political level and cannot be directly influenced.

3 IMPLEMENTATION OF ENPOR POLICIES AND MEASURES IN GERMANY

3.1 National policy framework in relation to energy poverty, especially with regard to the private rental sector, and changes since the start of the project

The German Federal Government does not consider energy poverty as a problem of its own but rather treats it within its wider approach of poverty alleviation via welfare state measures[6]. Heating expenses of welfare recipients are fully covered by the state as long as considered reasonable (cf. §22(1) of Volume II of the Social Code and §35(4) of Volume XII of the Social Code). In contrast, allowances for electricity costs are included as a variable lump sum (depending on household size and composition) within the transfer payment, the so-called "normal requirement" (cf. §20 (1) of Volume II of the Social Code and §27a (2) of Volume XII of the Social Code). An analysis by the Consumer Association[7] has however shown that dedicated budgets within the "normal requirement" are insufficient to cover basic power needs (particularly with electric water heating[8]). As a consequence, despite high hurdles for energy suppliers to do so, around 234,926 power cuts have been recorded in 2021 (Bundesnetzagentur/Bundeskartellamt 2023). Households with incomes above the eligibility threshold for basic support (i.e., the working poor) can apply for housing benefits, which since 2023 also comprises a specific heating allowance between 96 € for a single household and €196 for a five-person household. In addition, the benefit comprises another allowance component, which is meant to offset the additional financial burden on household budgets due to the introduction of CO_2 pricing in the residential sector in 2022. While there is no Federal programme to explicitly tackle energy poverty, the Government financially supports non-state actors such as the Consumer Association or Caritas to provide energy-saving advice to low-income households. Furthermore, as a response to the energy crisis, the Government has introduced a price guarantee for household energy in 2023 according to which it takes over the excess costs for 80 % of a household's gas and electricity consumption (based on the consumption of the previous year), if prices exceed a specified level (12 ct/kWh for gas and 40 ct/kWh for electricity).

3.2 Heating related energy advice – DE

3.2.1 Description of the measure prior to the ENPOR co-creation process

The most prominent measure to tackle energy poverty is the "StromSparCheck" (Energy Saving Check) project administered by Caritas in cooperation with the Federal Association of Energy and Climate Protection Agencies in Germany, in which long-term unemployed are trained to provide energy-saving advice and low-cost technical devices free of charge to welfare recipients and low-income households. While the German Government fully covers the heating expenditure of welfare recipients, these need to cover electricity costs from a capped budget for overall living expenditure.

[6] https://energy.ec.europa.eu/system/files/2022-08/de_final_necp_main_en.pdf
[7] https://www.verbraucherzentrale.nrw/sites/default/files/2018-06/VZ-NRW_Strompauschale-HartzIV_FINAL.pdf
[8] Despite an increased lump sum for these households.

Accordingly, the project mostly focuses on electricity savings, but has started to extend its activities to heating related advice in some locations. Public relations and advertising of the services involve local job centres and various other municipal and civil society organisations to reach the relevant target groups.

In a first household visit, the energy advisors provide a thermohydrometer as an immediate aid to the customers to monitor their indoor climate conditions. In a standardized data entry form, they record possible problems, technical data regarding the energetic condition of the apartment and its heating system, energy and warm water use, but also information on the advised household. The heating bills deliver important information to identify saving potentials. The consulted households are asked to provide these bills, but often they are not available. Communication, especially in the beginning, focuses strongly on technical conditions and possible problems. The information is collected in a central database and analysed by the energy advisors. The results are presented to the households in a second household visit one week later and form the basis for individual consulting strategies that may include the further provision of immediate aids like sealing tape, draught excluder or water-saving shower heads. In some cases, a third household visit can be realized and offers the chance to monitor the advisory impact in terms of achieved heat energy savings. However, due to considerable efforts required and against the background of lacking coverage of these monitoring visits from the project funding they are only irregularly implemented.

3.2.2 Changes to the measure resulting from the co-creation with the national REACT group

The co-creation in the REACT group helped to identify and develop novel approaches to engage households with a view to energy efficient heating and ventilation and thus increase the effectiveness of the heating advice. As a result, the decision was made to put more emphasis on comfort and to some extent health benefits within the communication and to support and strengthen the consulting contents through visual aids, of which parts enable better understanding and self-experience of proper room ventilation on indoor climate and others act as reminders for adapted heating and ventilation practices. Furthermore, the provision of additional low-tech aids to better monitor hot water consumption was decided. It is expected that by these measures, target groups who carry little interest, background knowledge of the heating topic or have difficulties grasping the issue, can gain a better understanding and will be motivated by illustrations, pictograms, reminders and gamification to change and adapt their behaviour and establish energy-efficient routines. It may also serve the purpose of making it easier to overcome language-related hurdles. The following policy improvements were implemented:

1. Integration of comfort query in the data entry form

In order to link the dimension of comfort to the topic of energy-efficient housing, the latter is framed not only as a technical issue but a matter of personal well-being. To this end, a query on the comfort perception of the household should be included at the beginning of the data record form.

Due to a lack of financial incentives for efficient heating behaviour, this is meant to increase the

intrinsic motivation of the advice recipient to engage with the matter of energy efficient heating and ventilation and thus secure sustained behavioural change.

2. Ventilation/heating media package, consisting of:

A) Ventilation guide: The ventilation guide schematically shows the air circulation of four different ways of ventilation: shock ventilation, cross ventilation, and tilt ventilation with each open and closed door. Using this illustration of four rooms, with blue and red arrows for fresh and stale air, and a related evaluation system with red stars where a maximum of five stars shows the most effective way of ventilation, the measure is meant to improve the information transfer on impacts of different ventilation methods using visual display, which could accommodate not only target groups that have difficulties with the native language. Originally, the graph has been used for the training of the programme´s energy advisors but is now handed-out to the visited energy poor households. In the course of the co-creation, the sheet has been simplified by further condensing text to the essential information and replacing parts of it with a graph, indicating that radiators should be turned down during the ventilation process.

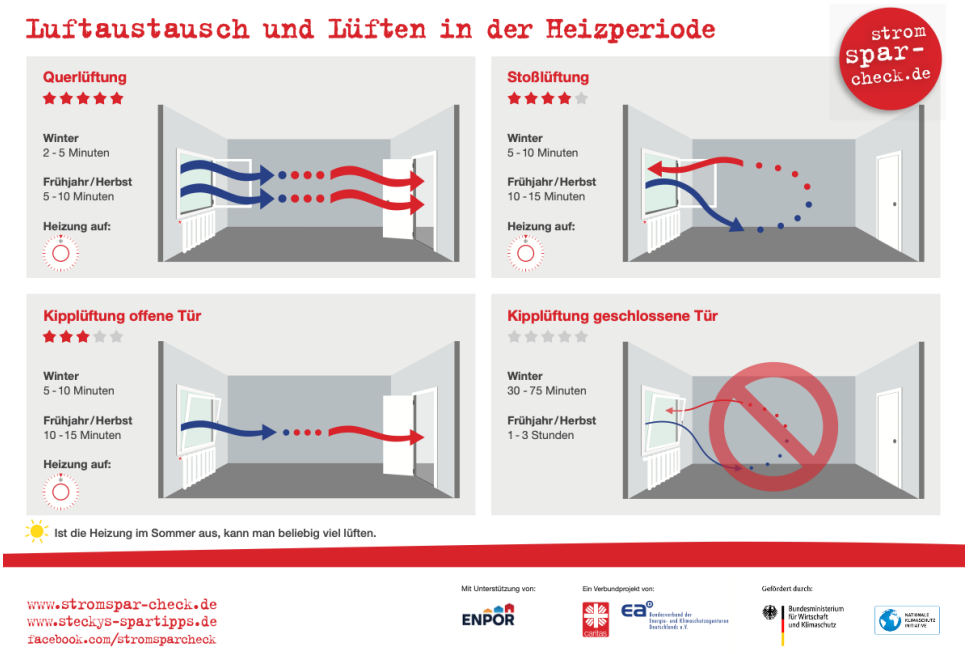


Figure 4: Graphical ventilation guide for heating related energy advice

B) Ventilation diary: Another element of the media package is a block of recording sheets with diagrams for room temperature and relative air humidity that is handed out to the household in combination with a digital thermohydrometer measuring temperature and relative humidity levels.

On the front page of the block, the principle of the diary is visualised using different colours and supported by smiling and sad-looking emojis signalling to the user where optimal and non-optimal value combinations lie in terms of avoidance of mould development and health risks due to dry air

and airborne diseases. In addition, on the back instructions in different languages on how to use the diary are included as a reminder followed by multiple pages with the diagrams and lines for entering data. The household is asked to document measured values from the thermohydrometer throughout the week following the visit, before and 20 minutes after ventilation using and indicating differing ventilation methods, the duration of airing, the room and the date of the data entry. The aim is to strengthen the understanding of the issue of bad indoor climate and its interlinkage to personal well-being and to train households how to read the thermohydrometer and act on the information to maintain a healthy indoor climate.

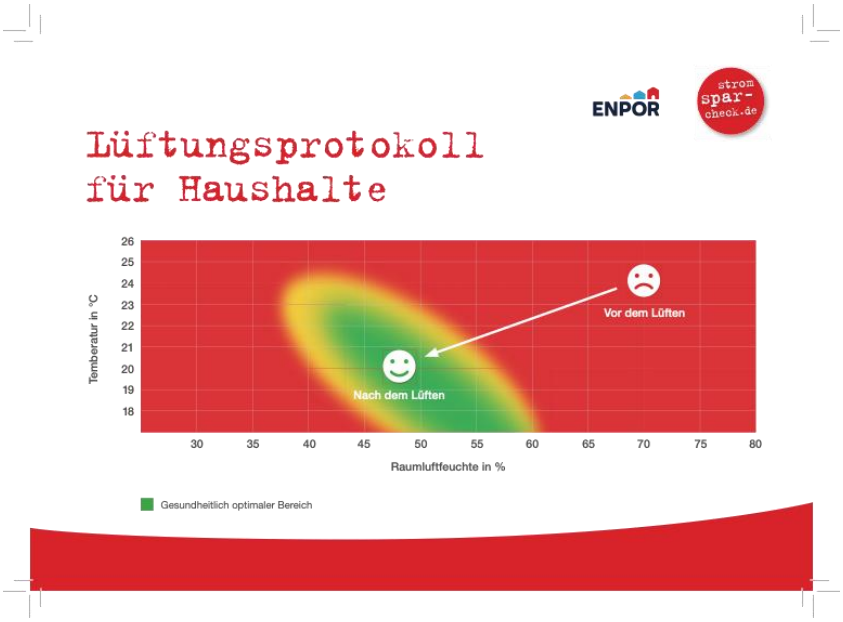


Figure 5: Front page of the ventilation diary

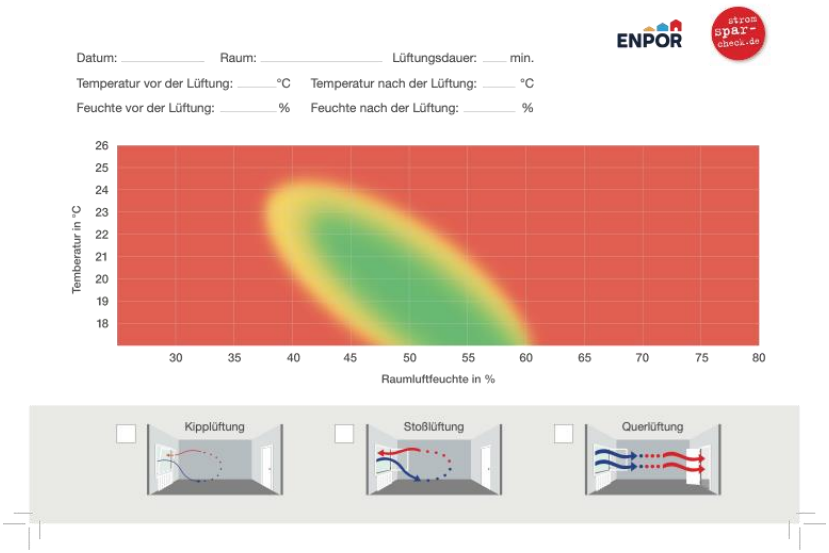


Figure 6: Example of a documentation sheet of the ventilation diary

C) Visual reminders: As a last element of the media package, the policy improvement comprises transparent adhesive foils with ventilation instructions for windows and paper pendants for radiators with information on the energy efficient use of heat controllers. Placing these reminders in proximity to the action they aim to inform on shall support the sustained implementation of advised heating and ventilation behaviour.

Figure 7: Visual reminders with ventilation instructions and information on energy efficient use of heat controllers

3. Shower alarm clock:

Lastly, an hourglass serving as a shower alarm clock is part of the immediate aid for the consulted households. Using a non-electric device, with an encasement, is expected to ensure a long-lasting application and support energy-efficient behaviour.

4. Monitoring/Second and third household visits

The improvement of the policy measures further includes a more systematic monitoring with an additional recording of data on the use and assessment of the media package as well as behavioural

changes in the second household visit. In addition, advised households are called by phone in the following heating period and queried about the continued use of the media and thermohydrometer, whether behavioural changes were sustained and whether their comfort has improved as consequence of the advice/behavioural changes. Lastly, their interest in a third household visit for the purpose of assessing possible changes in the heat consumption is inquired.

3.2.3 Description of the implementation process

1. Integration of comfort query in data entry form

A query on the comfort perception of the target household has been included at the beginning of the data record form to induce a different framing of the topic when the energy advisor speaks to the customer. The energy advisors have been informed and trained for the adapted communication process. During the first advice visit, advisors will use the question to steer the attention towards possible issues related to inefficient heating or insufficient ventilation of dwellings.

2. Ventilation / heating media package

The ventilation guide to be included in the advisory process has been used for the training of the programme´s energy advisors. It already existed and just had to be slightly adapted, reproduced and handed out to the visited energy-poor households by the advisors. This happens in the first household visit, in which advisors use it to explain why proper airing is important from a health perspective and by which methods it can be achieved most effectively and energy efficient. The ventilation diary is then handed out with the thermohydrometer and advisors explain and demonstrate how to use it. Households are then asked to try out different techniques until the next visit in a week and insert the results in the respective diagrams and the accompanying information.

The transparent adhesive foils with ventilation instructions for windows and the paper pendants for radiators with information on energy efficient use of thermostats both had to be newly designed and produced. The energy advisors distribute them to the advised households in the first household visit and, if agreed by the customer, attach them directly to windows and radiators.

Regarding all three components, the energy advisors had to be trained on how to best integrate them into their advice practice. Adequate amounts of time for additional explanations and demonstration of the materials as well as additional data collection need to be included into the advisory process.

3. Shower alarm clock

The alarm clocks have been purchased. The energy advisors provide them to their clients as well in the first household visit.

4. Monitoring / Second and third household visits

In order to monitor the adoption of the new advice elements by the advised households and their impact in terms of knowledge transfer, behavioural changes and improved well-being, a concept

and corresponding data collection instruments in the form of survey sheets were developed. The data collection activities start with the first household visit, in which data on indoor climate, ventilation and heating behaviour, comfort levels, presence of mould, and the handed-out material is collected by the Caritas energy advisors and inserted in the recording sheets.

In the second household visit, a first data collection to assess short-term impacts is implemented, reviewing the use of and entries into the ventilation diary as well as the perception and use of the other provided materials. In the following heating period then, the energy advisors call the households by phone and ask about (sustained) changes in terms of ventilation and heating behaviour, perceived changes of comfort levels and their use of the provided material. If agreed upon, the energy advisors will make a third household visit to examine changes to the heating energy consumption and to record possible long-term impacts of the new approach. A further training for the energy advisors and finance for the additional outlay need to be secured.

5. Pilot phase

The described changes of the policy measures were tested in a pilot phase with 50 households, starting from November 2021. Together with the energy advisors, the instruments were discussed and evaluated.

3.2.4 Role of the REACT group in the implementation

Apart from the implementing partner Caritas, the REACT group members themselves do not have an active role in the implementation of the policy. They have been engaged to discuss the results and possible adaptation options after the pilot phase and will be again consulted on the final evaluation results after the end of the heating period.

3.2.5 Risks and challenges in the implementation of the policy/measure

Currently, mainly the following risks were perceived in the implementation of the policy/measure:

1. The content, concept and use of the ventilation diary could be too complicated and overstrain the target group (inserting values into the diagrams, language problems).
    - Risk mitigation: The text is reduced, images are used to visualize the content, symbolic colours (green/red) are used to give an orientation.
2. The coloured paper pendants for the heating radiator and adhesive foils could disturb the customers aesthetic sensitivity in their living style (colour, size) and not be accepted by him/her.
    - Risk mitigation: Only little colours are used and the hanger has been limited in size.
3. Even, if implemented, households can ignore the visual reminders so that they remain without effect.

- Risk mitigation: Emphasize the link on comfort and health to strengthen intrinsic motivation.

4. Lack of interest and motivation to change the own behaviour.

    - Risk mitigation: Emphasize the link on comfort and health to strengthen intrinsic motivation.

5. Alarm clock could be functionally impaired.

    - Risk mitigation: Use a non-electronic version that is robust and needs no change of batteries (“predetermined breaking point”).

6. Poor implementation by the energy advisors regarding the adapted communication, data recording or provision of the newly introduced material and aids.

    - Risk mitigation: Early involvement and repeating training and information Overall, the implementation of the adapted measures has been tested in a pilot phase. Possible changes in the implementation process were discussed after the pilot phase evaluation.

7. Loss of people between the second and third household visit, due to the long-time window.

    - Risk mitigation: In the preceding contacts, emphasis is placed on building trust with the households and clearly communicating the added value of the measure for them.

3.2.6 Implementation results and lessons learned

As of now, more than 500 households were adviced using the newly developed approach. The preliminary impact evaluation following the pilot phase indicated an overall positive assessment of the provided material by the advised households. To the question, whether they intended to adapt their ventilation behaviour following the advice, the highest share of positive responses (around a third) was given from households, who had properly used the ventilation diary, indicating a successful knowledge transfer in these instances.

In light of the preliminary positive results from the pilot phase at the pilot site in Düsseldorf, the implementing partner Caritas has decided to roll out the developed approach at all other EnergySavingCheck locations in Germany (around 60) that are currently providing heating related energy advice. To this end, the federal coordination center of the programme has earmarked the needed funds to produce the materials in bulk to be requested by the locations. In addition, a training concept will be developed to convey the idea and implementation steps to the involved advisors at the different locations. Also the monitoring tools are adjusted to systematically gather and evaluate corresponding data in the central data base.

In terms of new stakeholder engagement in the process, the participating housing company indicated interest in exchanging bilaterally with Caritas on ways how to better reach out to households or possibly improve access to heating bills. However, no concrete steps have been undertaken so far to further pursue this.

Furthermore, the participating representatives from the Consumer Association expressed interest in using the developed materials in their own energy advice activities. Along this line, the approach was presented by the ENPOR team to the members of the inner working group on energy matters. Once the materials have been produced in bulk, a way forward to make them available to the Consumer Association will be discussed.

Lessons learned within the implementation process related on the one hand to the importance of advisors' dedication to engage households with no or little financial incentive and which often are dealing with a variety of issues for the heating / ventilation topic. The emphasis on health and comfort aspects of a sufficient air exchange has been identified as a good strategy to overcome this barrier. On the other hand, the use of visual aids to convey advice content and gamified self-experience activities to learn how to use a thermohydrometer has proven to be a suitable approach to facilitate knowledge transfer against the background of language barriers in a majority non-native target group.

3.3 Pre-paid metering EnergieRevolte – DE

3.3.1 Description of the measure prior to the ENPOR co-creation process

EnergieRevolte is a subsidiary of Stadtwerke Düren, a municipal utility in the West-German state of North Rhine Westphalia. Their customers are offered an innovative model of prepaid metering and free switch from existing electricity provider to a digital prepaid meter that can be monitored by customers and charged just-in-time via a smartphone app or online interface. This allows them to better control their electricity consumption and electricity bills. The app allows the tracking of customers' electricity consumption in 15-minute intervals. Currently, about 2,600 customers are using the app, not only in North Rhine Westphalia but also in other areas such as Berlin and Frankfurt, including a high proportion of low-income and energy poor households. Within the ENPOR project, the app has been further developed to provide additional utility to customers in terms of improving knowledge transfer about drivers and possible means to reduce unnecessary electricity consumption. In doing so, a close exchange with the target group (i.e., the app users) was envisioned, which has been achieved by implementing regular feedback loops within the co-design process and the following evaluation.

3.3.2 Changes to the measure resulting from the co-creation with the national REACT group

Against the background of budgetary and technical restrictions, the decision was made to implement the following improvements. In terms of improving the transparency for users with view to their electricity consumption and costs, the yearly consumption curve in the consumption display was amended with an additional line reflecting the user's consumption of the previous year. In addition, users are shown the absolute and relative difference in kWh and percent. With view to

the provision of additional information related to electricity conservation in the app, a new website was developed to which the link is included in the app.

On the website called “Energy Saving World”, users can find both written information and embedded video content on 1) how to efficiently use different appliances, clustered by room type in which they are usually located/used, 2) how energy labels work and how to use the information for decision making, 3) how to use the app and its functions to identify power guzzlers in the household and 4) links to external free energy advice offers, both digital and in person, as well as to state support services related to debt counselling and energy cost support.

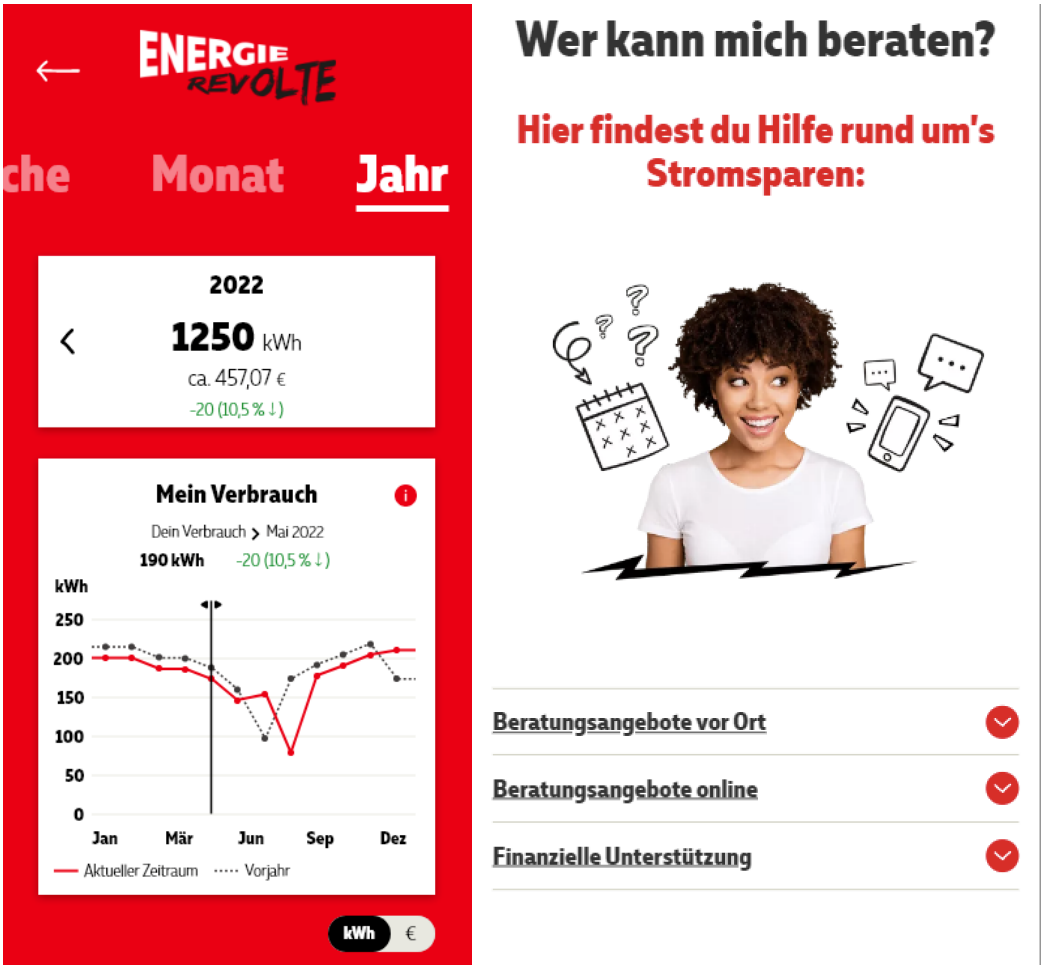


Figure 8: Display of the EnergieRevolte app

3.3.3 Description of the implementation process

The implementation process consisted of a refinement phase, in which the ENPOR team in bilateral exchange with the implementing partner EnergieRevolte further clarified details of the identified app improvement and another involvement of customers to gather additional feedback on the developed improvements and the technical implementation of the final co-design results.

In the refinement phase, the ENPOR team developed a draft for the structure and content of the "Energy Saving World", which the EnergieRevolte team then implemented as a website, to which the link was embedded in one of the app pages. In addition, the team implemented the consumption comparison function. Both products were shared with the REACT group members for additional feedback. As a next step, the newly developed functions of the app have then been shared with interested customers in a Facebook group dedicated to gathering feedback on planned innovations or the app in general. In light of overall positive feedback, no additional modifications were implemented afterwards and the rollout was initiated.

3.3.4 Role of the REACT group in the implementation

The REACT Group members' role in the implementation of the measure is limited to an advisory role. The REACT group members will be engaged to discuss the results and possible adaptation options after the rollout and following evaluation.

3.3.5 Risks and challenges in the implementation of the policy/measure

Risks related to the implementation of the newly developed functions mostly relate to technical malfunctions. These were addressed within the process via diligent beta-testing prior to the rollout. In terms of challenges, the energy price increases following the Russian invasion of Ukraine has also affected the EnergieRevolte pre-paid model insofar as on the one hand, prices had to be increased and as a consequence, functions had to be extended to allow for the display of cost differences between two periods using different prices. Due to this, the function had to be overhauled and rolled out again.

3.3.6 Implementation results and lessons learned

At this point, the evaluation of the novel app functions is still pending. However, descriptive statistics regarding the number of visits to the "Energy Saving World" website indicate good reception by the app users. Until May 2023, around 1,404 visits from 874 distinct users have been recorded. Users on average only spent around 45 seconds on the site, which however may be biased downwards by web-crawling bots. Due to developments in the energy market and expectations by shareholders, a continuation of the pre-paid app model by EnergieRevolte beyond a two-year horizon is currently uncertain The app being a white label product however means that it will very likely continue to be used by other utilities in the future. Novel connections with other stakeholders were created by embedding links to external advice and other support offers.

Lessons learned relate mainly to the technical complexities of designing user-specific feedback functions, which require substantial amounts of user and benchmark data but also earmarked budgets to implement more complex improvements. In lack of these resources, developments had to be focused on more passive information/feedback functions, possibly limiting the impact in terms of building up user knowledge regarding the causes of high energy consumption in the household.

4 IMPLEMENTATION OF ENPOR POLICIES AND MEASURES IN ESTONIA

4.1 National policy framework in relation to energy poverty, especially with regard to the private rental sector, and changes since the start of the project

The Estonian national renovation grant has been recognized by the legislator as a suitable policy for addressing energy poverty. Initially established in 2010 as a public initiative under the Estonian financial institution KredEx, the grant aimed to support the liberal retrofitting economy within the fully privatized Estonian housing market. Originally conceived as a temporary measure, the grant demonstrated its success during the initial support period and was extended in 2014. In 2019, adjustments were made to refine its focus and functionality, leading to a second extension.

Over the course of its first 10 years of operation, the grant played a pivotal role in renovating 1,114 buildings, resulting in a reduction of 140,000 tons of CO2 emissions. This initiative has been recognized as a noteworthy example of a public initiative at the EU level. The latest support instrument, launched in April 2023, already incorporates recommendations from the ENPOR project. While it cannot be claimed that all shortcomings mentioned in section 4.2.1 have been fully addressed, significant progress has been made. It is worth noting that the grant conditions appear to have improved, as an €80 million grant was distributed within a single day, benefitting 212 apartment buildings.

4.2 National renovation grant – EE

4.2.1 Description of the measure prior to the ENPOR co-creation process

The Estonian national renovation grant[9][10][11] has probably been one of the most influential tools that have been used for mitigating the long-term effects of energy poverty in Estonia. Analysing, learning from and improving the energy poverty dimension of the national renovation grant was the focus of ENPOR in Estonia. Redesigning the retrofitting policy to better mitigate the risks of energy poverty will hopefully help to avoid or reduce these shortcomings in the future.

The shortcomings of the Estonian national renovation grant can be divided into three categories according to our observations:

1. Financial shortcomings, such as heavy reliance on the financial capacity of the building associations and by this, the owners,
2. Administrative shortcomings, such as the lack of stability, and
3. Technical shortcomings, such as the support of partial renovations with only a limited effect on energy efficiency.

The fiscal challenge of deep retrofitting is maintaining the balance between the living costs before

[9] https://kredex.ee/en/services/ku-ja-kov/renovation-support
[10] https://kredex.ee/en/services/ku-ja-kov/renovation-grant-2019
[11] https://kredex.ee/en/services/ku-ja-kov/renovation-grant-2020

and after the retrofitting. With the help of cheap EU housing loans, the balance has been set just about right by compensating for some increase on the total housing costs with a significant upgrade on the indoor quality and comfort level (not to mention the increased real-estate value). However, the grant relies on the financial capacity of the building owners (about 60-70 %) and this capacity is not always there. The initial design, based on the house loans offered by several private banks, has had its own weaknesses. With criteria for the loan applications, the banks are superimposing their own set of conditions and thus creating a barrier for the buildings in the areas that do not witness the increase of real-estate value as an outcome of the retrofitting. With no way to meet the loan criteria, these areas are locked out of using the public grant and, because of this, are becoming the retrofitting dead-zones, further amplifying the regional inequity in living conditions and energy improvements. In 2020, the situation has been improved with by providing a state financed loan service for the applications rejected by the private banks.

4.2.2 Changes to the measure resulting from the co-creation with the national REACT group

The co-creation process with the REACT group resulted in the development of ideas and proposals that were taken into account when changes were made to the conditions of the national renovation grant. The recommendations for political decision-makers were presented in November 2022 and focused on various aspects:

1. Emphasizing the importance of renovation capacity in regulations and legislation:

    1.1 Placing emphasis on renovation capacity and its potential for development, which would create new opportunities to increase the renovation of apartment buildings. The priority should be on improving the entire building rather than focusing on individual components such as roofs or facades.

        - Implementation of the recommendation: Under the current renovation grant conditions, apartment buildings are required to undergo full renovation. However, buildings located outside Tartu and Tallinn are exempt from achieving a specific energy class and using ventilation with heat recovery. Despite this exemption, they still need to insulate facades, replace windows, insulate roofs, install new heating systems, and implement mechanical exhaust ventilation, all of which are conditions of full renovation.

    1.2 Promoting the full renovation of historic buildings by providing additional support.

        - Implementation of the recommendation: Renovating historic or heritage-protected buildings qualifies for an extra 10 % funding support.

2. Increasing the capacity of parties involved in the renovation process:

    2.1 Enhancing the role of tenants in the apartment building renovation process and involving them in the decision-making process alongside the owners of rental apartments or as their representatives.

- Implementation of the recommendation: While the government has limited influence at the regulatory level over tenants' involvement in decision-making, tenants can make decisions regarding renovations if they are granted a letter of attorney by the owner. In Estonia, tenants often do not reside in one apartment for long periods and rarely for a lifetime.

2.2 Providing renovation information in languages accessible to non-native speakers.

2.3 Establishing a dedicated energy agency to support the renovation of apartment buildings and other energy transition activities in the main non-native speaking region, Ida-Virumaa. An example of such an agency is the Tartu Regional Energy Agency.

- Implementation of the recommendation: While no new energy agencies have been established, the grant holder of KredEx has developed a regional consulting center network throughout Estonia with renovation consultants. These centers offer consultations in multiple languages, addressing the need to provide renovation information for non-native speakers.

2.4 Promoting the wider use of digital tools in the housing association participation process to overcome the bottlenecks in these processes. This recommendation was not achieved.

- Implementation of the recommendation: The goal of promoting the wider use of digital tools in the housing association participation process has not been achieved.

3. Increasing renovation capacity with the assistance of the national renovation grant, including:

3.1 Ensuring sustained financing for the state renovation grant over a period of at least 10 years.

- Implementation of the recommendation: As KredEx utilizes EU funds to support renovations, long-term planning for funding is challenging. However, for the grant period of 2022-2027, the allocation for renovation projects exceeds 350 million euros.KredEx has decided to divide this amount over three to four years, allowing apartment buildings to adequately prepare and preventing a surge in construction costs due to labor shortages.

3.2 Enabling the national renovation grant to cover the salary of a designated board member of the building association.

- Implementation of the recommendation: KredEx has made it mandatory for apartment building associations to hire a technical consultant who serves as the project manager for renovation projects. These consultants provide

assistance and handle all administrative tasks for the building association, from grant applications to the finalization of guarantee documents post-renovation. Consequently, there is significantly less workload for building association board members.

3.3 Expanding the inclusion of energy poverty target groups within the national renovation grant and assessing its impact on energy poverty.

- Implementation of the recommendation: Energy poverty is particularly prevalent outside of Tartu and Tallinn, and even more so in the outskirts of Estonia. As a result, the national renovation grant allocates 30 % of the funding to Tartu and Tallinn, 40 % to other cities and county centers, and 50 % to the rest of Estonia. This targeted approach aims to address energy poverty disparities across different regions.

3.4 Providing exclusive support for full renovation of apartment buildings through the national renovation grant and implementing additional measures to assist building associations with limited renovation capacity during the full renovation process.

- Implementation of the recommendation: Currently, only full renovation projects are eligible for support. KredEx offers financial assistance to building associations with limited renovation capacity in various ways:
    - Apartment building associations can apply for the renovation grant.
    - Apartment building associations can request a renovation loan from KredEx to cover the self-financing portion. This option is available if the association is unable to obtain a loan from a private bank, typically due to low property value or a high proportion of (energy) poor residents.
    - Apartment buildings can apply for KredEx guarantees for private bank loans.

  This is necessary when a private bank is willing to provide a loan, but the building itself does not provide sufficient collateral.

3.5 Supporting cluster renovations, simplifying joint procurement processes, and implementing measures to enhance the capacity of building associations.

- Implementation of the recommendation: Multiple buildings are allowed to apply for grants collectively and engage in joint procurement for construction services. It is also permissible for a technical consultant, who advises multiple buildings, to submit joint applications on behalf of all associated buildings. These buildings do not have to be located in close

proximity to one another. KredEx introduced these changes to streamline paperwork for building associations, attract larger construction companies to the renovation market, and potentially reduce renovation costs. Furthermore, offering a larger-scale project increases the likelihood of obtaining a lower price. This approach is particularly beneficial for buildings located in the outskirts of Estonia.

3.6 Supporting district-wide multi-building renovations, together with the simplifications needed for joint procurement, measures to improve the capacity of associations, and support measures for improving the area between buildings.

- Implementation of the recommendation: Unfortunately, this recommendation has not been implemented. Although this recommendation has not been realized, it could have brought about significant benefits in terms of efficiency, coordination, and overall improvement of the district.

3.7 Supporting foundation-wide multi-building renovations, together with the simplifications needed for joint procurement, measures to improve the capacity of associations, and support measures for improving the area between buildings.

- Implementation of the recommendation: Similarly, the recommendation for supporting foundation-wide multi-building renovations, where multiple buildings belonging to a specific foundation or organization undergo renovation, has also not been implemented.

4. Increasing renovation capacity in the City of Tartu – while it is not directly part of the National Renovation grant, it is a significant aspect of the Estonian renovation wave.

4.1 Developing a major district-based renovation project in Tartu to facilitate the formulation and implementation of a comprehensive renovation plan for the entire district (or other urban spatial unit).

- Implementation of the recommendation: Progress has been made in this area through the buildEST project, which encompasses the Estonian renovation plan. As part of this project, the City of Tartu will establish a living lab district and create a renovation plan for it.

4.2 Seeking European ELENA grant funding to support district-based renovation in the Annelinn district.

- Implementation of the recommendation: Tartu has secured one ELENA grant, and if successful in the implementation, they plan to continue applying for this grant to further support district-based renovations.

4.3 Establishing comprehensive renovation consulting services in Tartu, often referred to as a one-stop-shop approach.

- Implementation of the recommendation: The establishment of full-package renovation consulting services is already underway as part of the ELENA grant project.

4.4 Formulating community agreements with organizations and associations that contribute to increasing the number of full renovations of apartment buildings. The community agreement is an engaging initiative initiated by the City of Tartu, urging organizations operating in the city to support its sustainable goals.

- Implementation of the recommendation: This initiative is planned for autumn 2023 when the city will launch a campaign for community agreements to achieve the goals outlined in the SECAP (Sustainable Energy and Climate Action Plan).

4.5 Facilitating dialogue between tenants, real estate companies, and universities in the City of Tartu to identify issues in the rental market and mitigate any negative impacts.

- Implementation of the recommendation: Unfortunately, this particular recommendation has not been implemented.

4.2.3 Description of the implementation process

TREA has played a crucial role in enhancing the capacity of national policymakers to understand the adverse effects of energy poverty and address them more effectively. Building on this foundation, new components have been incorporated into the Estonian national renovation grant to facilitate improvements for this specific target group. Consequently, the national refurbishment policy will be better equipped to enhance the living conditions of energy poor households.

The work of the REACT group has resulted in policy recommendations for national legislation, which encompass various aspects such as social considerations, financial factors (e.g., low real estate value), demographics, geographic considerations, infrastructure, and others. These recommendations have been discussed with policymakers, including KredEx and the Estonian Ministry of Economic Affairs and Communication.

TREA will provide support to tenant and landlord associations throughout the refurbishment process and beyond.

This support includes offering technical expertise, negotiating with service providers, monitoring energy consumption, and educating tenants on energy-saving measures for everyday practices. These efforts aim to empower associations and foster sustainable energy practices within the community.

4.2.4 Role of the REACT group in the implementation

To address the challenges related to energy poverty and improve the effectiveness of retrofitting policies, an expert group was established as the REACT group in Estonia, consisting of representatives from various stakeholders in the renovation service chain. The group has initiated an analysis of the current situation and serves as a platform for open dialogue on energy poverty, marking the initial step towards implementing measures to mitigate its effects.

During the co-creation meetings conducted under the ENPOR project, the REACT group members played a crucial role in identifying the deficiencies in retrofitting policies, particularly those related to the national renovation grant. Recommendations for the renovation grant were collectively formulated through these REACT group meetings.

The first REACT group meeting focused on mapping the problems associated with apartment building renovations. The second meeting involved consolidating the identified issues and conducting an in-depth analysis. In the third meeting, the group dedicated their efforts to analyzing potential solutions and formulating recommendations for the national renovation grant. During the fourth REACT group meeting, proposals for political decision-makers in Estonia were reviewed and discussed, with a specific focus on increasing renovation capacity in the City of Tartu. The fifth REACT group meeting centered on presenting the outcomes of two EU projects focused on energy poverty to policymakers at the local and state levels.

4.2.5 Risks and challenges in the implementation of the policy/measure

The concept of energy poverty is fairly new and has not been fully established in European and national legislation. There is no fixed definition for energy poverty, its impacts are unknown and so are the effects of mitigation measures. More importantly, there is a lack of research and analysis on this topic in EU countries that could be used for a theoretical basis for policy development. In the context of increasing energy prices and the increasingly vocal political opposition for the energy transition, it is difficult to convince the stakeholders to allocate time, money, and effort into policy development. The unpredictability, novelty of the topic and the lack of previous work are the main risks for the policy implementation.

One of the major challenges associated with energy poverty is its multidimensional nature. It is a problem area that includes both social aspects and technical aspects regarding energy efficiency and therefore requires an interdisciplinary approach. However, this often proves to be a challenge in implementation, as experts from both fields often lack practical access to the other. This is also due to a lack of common terminology and methods.

In our experience, this also proves to be difficult in Estonia, where it is necessary for experts to familiarise themselves with new topics and problems whose solution turns out to be complex. Bridging the gap between these working fields therefore proves to be a challenge time and again and it played a substantial role in the policy implementation process.

The second risk of unfamiliarity is related to the existing division of labour and separation of the subjects in public administration. Poverty and energy are topics under very different administrations, having different formalities, institutional practices, and funding. Currently, there is no direct cooperation between these institutions, but synergy effects could be used and interdisciplinary approaches implemented. However, there are still no plans at the level of public administration to become active in this direction. Nevertheless, risks related to initiating cooperation and redefining the territories also have the potential to hinder the progress of implementing energy poverty policies.

Addressing the core problems like financial, administrative, and technical shortcomings carries the risk of being eventually too ambitious and, in combination with other risk factors, may require more time and resources for the progress to emerge. Especially overcoming structural problems like the lack of financial capacity among private owners and renters can be challenging.

4.2.6 Implementation results and lessons learned

The Estonian national renovation grant is expected to continue for at least 3-4 years with the available funding from KredEx, and likely beyond that, as the Estonian government aims to renovate all buildings to a C-energy class by 2050. KredEx or another government financial institution will continue to oversee and implement this grant. KredEx has consistently sought input from stakeholders to ensure that the grant is accessible to all citizens, and it is expected that this accessibility focus will continue in the future, allowing TREA to continue its work initiated through the ENPOR project.

The national renovation grant has been awarded since 2010, and with each passing year, more capable apartment buildings have already undergone renovation. Therefore, each new round of the grant must be more accessible to apartment building associations where economically vulnerable individuals reside. Addressing energy poverty must be a key priority for KredEx. The ENPOR project highlighted the challenges faced in renovating buildings with numerous tenants, which should also encourage the government and KredEx to find solutions that protect tenants' rights in such buildings.

The national renovation grant, along with the implemented recommendations, was opened in April 2023. A total of 212 apartment buildings received support in this round, amounting to over 80 million euros. Based on calculations from previous renovations using the national renovation grant, published by KredEx in 2014, it is estimated that these renovations can achieve an annual energy saving of 3.9 MWh per apartment building. Therefore, the energy savings resulting from this grant round amount to 826.8 MWh or 0.826 GWh.

Considering the average building size of 1700 m^2, approximately 360,400 m^2 of buildings will be renovated.

Unfortunately, it is difficult to determine the exact number of households benefiting from these renovations due to the varying sizes of apartment buildings. In the long term, Estonia has

approximately 600,000 households, and statistics indicate that 71 % of citizens live in apartment buildings. Thus, the national renovation grant has the potential to target approximately 426,000 households.

From the implementation of this measure and the work conducted in the REACT group, it has become apparent that assisting tenants in energy poverty is challenging. This is primarily due to the fact that all apartments in Estonia are individually owned, and there is no typical rental housing model as seen in other European countries. Individual apartment owners may not be interested in renovating buildings in which they do not reside, viewing it solely as a financial endeavor. Additionally, the prevalence of low wages in Estonia means that even if a building is renovated, tenants may not have the financial means to repay renovation loans, potentially forcing them to seek cheaper accommodations. Concentrating economically disadvantaged individuals in one area can lead to other social problems, emphasizing the importance of preserving diversity within apartment buildings.

The Estonian government, in collaboration with stakeholders, must find solutions to make renovations accessible and desirable for everyone. Making renovation obligatory would require much greater support than currently available.

5 IMPLEMENTATION OF ENPOR POLICIES AND MEASURES IN GREECE

5.1 National policy framework in relation to energy poverty, especially with regard to the private rental sector, and changes since the start of the project

Targeted policies have already been implemented in Greece in order to combat energy poverty since 2011. The draft National Energy and Climate Plan (NECP), which was prepared at the end of 2018, presents a brief presentation of the main implemented measures. Firstly, the Social Household Tariff, which was introduced to protect vulnerable consumer groups by providing discounts for the consumed electricity, is one of the most important policy measures to tackle energy poverty. The Solidarity Services Tariff has a similar objective for the case of legal entities of public law of a privileged nature, religious-charitable institutions, and specially certified private non-profit bodies. At the same time a one-off special aid was provided in 2017 to support low-income consumers who have been disconnected from the electricity grid due to overdue debts, facilitating the fulfilment of their energy needs. The protection of vulnerable household customers from cutting-off the electricity supply has been applied through the Universal Service regime, while the provision of a heating allowance to certain categories of consumers has been adopted in order to purchase heating oil, addressing the considerable increase of its final price. The heating allowance was expanded in order to cover additional energy carriers during the current energy crisis. Moreover, energy efficiency improvement programmes have already been launched at national level for low-income households since 2011 such as the 'Energy Savings at Home' programme. Finally, special provisions for the confrontation of energy poverty were promoted within the framework of the Energy Efficiency Obligation (EEO) scheme by increasing the delivered energy-saving units by a factor of 1.4. Last but not least, incentives are foreseen for RES installations by energy communities in order to satisfy the energy needs of their members and vulnerable consumers or citizens through the application of a virtual net metering scheme.

The alleviation of energy poverty has been specified as an essential objective within the framework of the final NECP[12], which was submitted in the end of 2019. A quantitative target has been set for reducing the energy poverty at least by 50 % and 75 % in 2025 and 2030 respectively in comparison to 2016, while the foreseen level in 2030 should be below the EU average in 2030. Moreover, targeted policy measures will be designed and implemented so as to tackle effectively the phenomenon of energy poverty, while emphasis will be given on the improvement of comfort conditions and the avoidance of the triggered health problems. Finally, the compilation of the Action Plan for the Confrontation of Energy Poverty is foreseen also. Lastly, additional measures will be initiated according to the provision of the NECP for protecting consumers along with the planned measures for tackling energy poverty.

[12] Source: https://ec.europa.eu/energy/sites/default/files/el_final_necp_main_en.pdf

The Action Plan for the Confrontation of Energy Poverty was prepared in September 2021 specializing the policy measures so as to ensure the fulfilment of the specified targets within the NECP. Moreover, the definition of energy poor households was determined. Specifically, a household is characterized as energy poor in the case that both of the following conditions are simultaneously fulfilled:

- Condition I: The total final energy consumption of the household is lower than the 80 % of the minimum final energy consumption, which is required theoretically for covering the thermal needs.
- Condition II: The total normalized income of the household, based on the number of the household's persons according to the equivalence scale of OECD is lower than 60 % of the mean income of all the households in Greece.

Totally, nine policy measures have been integrated into the Action Plan for the Confrontation of Energy Poverty to fulfil the specified targets. The proposed policy measures have been classified into the following three categories:

I. Measures for the short-term protection of energy poor households
   - M1: Improvement of the Social Tariff
   - M2: Provision of energy card to energy poor households
   - M3: Regulatory measures for the protection of energy poor households

II. Measures for the energy upgrade of the energy poor households' buildings and the promotion of RES
   - M4: Energy upgrade of the energy poor households' building including the installation of RES systems
   - M5: Provision of incentives to energy poor households within the framework of the Just Transition Plan
   - M6: Provision of incentives to energy poor households within the framework of the EEOs
   - M7: Provision of incentives to energy poor households within the framework of Energy Communities

III. Information and awareness-raising measures
   - M8: Conduction of information and awareness-raising measures within the framework of the EEOs
   - M9: Conduction of information and awareness-raising measures implemented centrally at national level

Finally, a holistic monitoring mechanism has been developed based on the combination of bottom-up and a top-down procedures. The bottom-up approach will be performed through the statistical

model, which has been developed to identify energy poor households taking into consideration various parameters, while the top-down monitoring will be applied through the Greek Observatory of Energy Poverty. The central role for carrying out the foreseen monitoring procedures is assigned to the Working Group, which has been established for monitoring and assessing the progress of the NECP with the following duties:

- Management, evaluation, and improvement of a monitoring mechanism.
- Evaluation of the implemented policy measures in the period 2021-2030.
- Formulation of proposals either for improving existing policy measures or designing and implementing new more efficient ones.
- Preparation of the annual progress report.

Article 19 of Directive 2012/27/EE was harmonised into the national legislation with Law 4243/2015 as amended by Law 4843/2021 according to the provision of Directive 2018/2002/EE. No specialized policies and measures were introduced for the confrontation of split incentives problems. It should be noted that the financing of landlords for the energy upgrade for their rented houses was eligible under the prerequisite that it is utilised as a permanent residence with the framework of the "Exoikonomo-Autonomo" programme.

5.2 Energy efficiency obligation scheme (EEOS) and energy upgrade of buildings – GR

5.2.1 Description of the measure prior to the ENPOR co-creation process

The first pilot policy in Greece was the national programme for the energy upgrade of residential buildings. The main objective of the "Energy upgrade of buildings" programme is to provide financial aid to energy poor households for improving the energy efficiency of their buildings. The respective programme has been integrated both in the National Energy and Climate Plan (2019) and the National Action Plan for the Confrontation of Energy Poverty in Greece (2021). It is the continuation of the 'Energy Savings at Home' programme focused on energy poor households. The 'Energy Savings at Home' programme started in 2011 providing financial incentives to households, including low-income households, so as to replace the window frames and install shading systems, to install thermal insulation in the building envelope, including the flat roof/roof and 'pilotis' and to upgrade the heating and hot water system. The financial aid consists of capital subsidy and low interest loans including the subsidy of the interest rate and the coverage of the energy inspections' cost. The measure has continued until 2021 via the "Exoikonomo-Autonomo" programme after continuous improvements enabling the implementation of the most cost-effective interventions to improve the energy efficiency of the residential buildings. The EEOs constitutes the second pilot policy in Greece. The EEOs started in 2017 imposing an obligation to achieve a specific target through energy efficiency interventions until 2020.

The conduction of energy efficiency interventions to energy poor households is also foreseen. The EEOs will also undertake an essential role not only in promoting energy efficiency generally, but for

contributing to the alleviation of energy poverty as outlined both within the National Energy and Climate Plan (2019) and the National Action Plan for the Confrontation of the Energy Poverty in Greece (2021). The EEOs will continue also in the period 2021-2030 according to the provisions of the NECP, while the ministerial decision for specifying the operational framework was adopted in June 2022 signalling the official initiation of the scheme.

The most important challenges and barriers, which were addressed during the re-design of the pilot policies, include:

- Design policies and measures focused exclusively on energy poor households and not to low-income households.
- Facilitate the identification and engagement of energy poor households into the planned policies and measures.
- Provide targeted incentives to tenants within the framework of existing policies and measures.
- Integrate the problem of energy poverty in the private-rented houses during the national definition of energy poverty.
- Provide specific incentives for tenants/landlords within the framework of the national programme for the energy upgrade of residential buildings.
- Foster the conduction of technical measures within the framework of the EEOs in addition to the existing information and awareness-raising measures.
- Establish a specialized mechanism for monitoring the triggered impacts on the alleviation of energy poverty from the implemented policies and measures.

5.2.2 Changes to the measure resulting from the co-creation with the national REACT group

The proposal for the case of the “Energy upgrade of buildings” programme, as resulted by the application of the co-creation process within the REACT group meetings, foresees the inclusion of the tenants as a distinct social criterion, while the provided public aid must be calculated taking into account the shared benefits among landlords and tenants.

According to the proposed design of the recently announced “Energy upgrade of buildings” programme, a specialised benchmarking system was developed taking into account specific energy and social criteria for the evaluation and ranking of the submitted applications. The energy criteria consist of the expected energy savings, the heating degree-days, the energy class of the building before the energy renovation, the construction age and the households’ income.

The social criteria comprise the existence of long-term unemployed household members, disabled members, children and single-parent families. It should be noted that a specific weight is assigned to each criterion in order to calculate the final score of each submitted application separately.

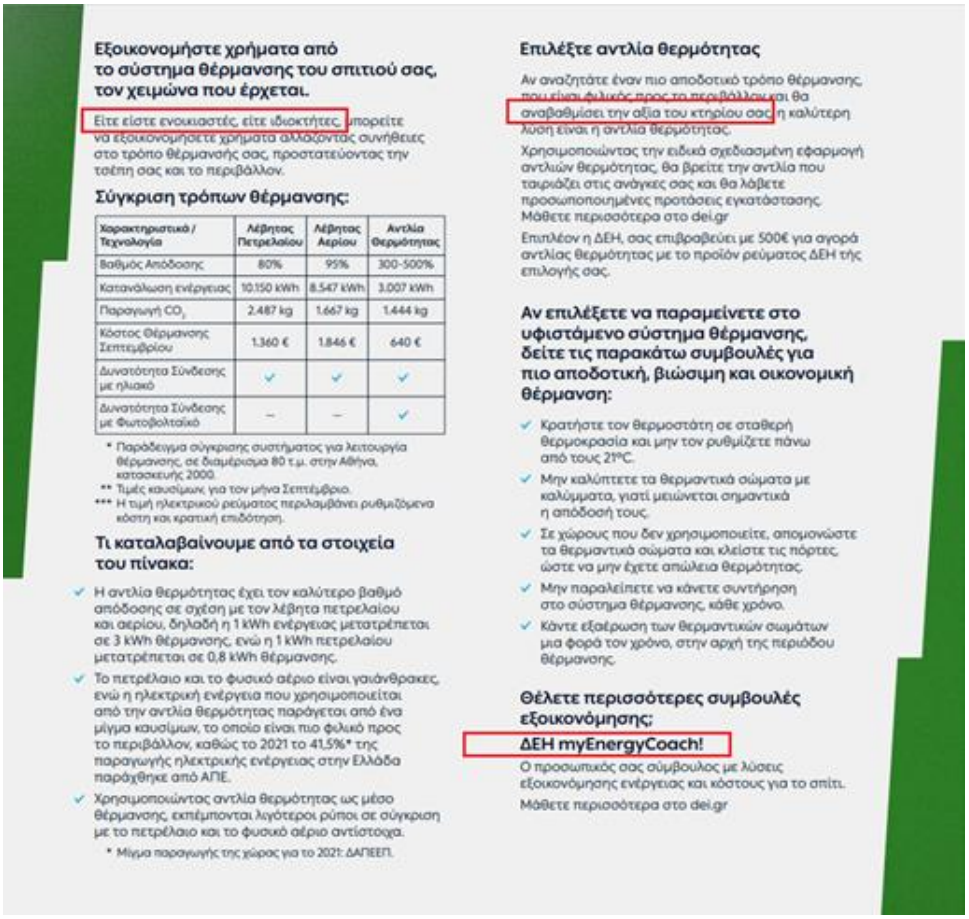
Moreover, a special provision for rented buildings has been introduced foreseeing the provision of a 40 % subsidy to the landlords. Finally, a dedicated portion of the foreseen public budget is allocated to energy poor households within the framework of the new programme fostering the implementation of targeted policies for tackling energy poverty in compliance with the targets of the Action Plan for the Confrontation of the Energy Poverty in Greece.

Another contribution of the co-creation process was the insertion of a targeted reference regarding the split incentive problem into the Action Plan for the Confrontation of the Energy Poverty within the measure M4, which refers to the energy upgrade of the energy poor households' buildings in the period 2021-2030.

Correspondingly, the proposal for the case of the EEO scheme foresaw the conduction of targeted information and awareness-raising activities by the energy suppliers providing useful and effective guidance to energy poor households, which dwell in rented buildings, so as to confront the phenomenon of energy poverty. Specialised information material and interactive tools can be utilised providing recommendations for the effective alleviation of energy poverty, while dedicated training programmes can also be organised for enhancing the current knowledge of the energy poor households. Finally, the conduction of simplified energy audits can foster the identification of the most cost-effective energy efficiency interventions facilitating the achievement of a minimum level of comfort. It should be noted that the energy suppliers can also promote the materialization of low-cost energy efficiency interventions, such as the promotion of energy efficient lighting systems and lamps, the installation of heat pumps and solar thermal systems for the production of hot water etc.

A co-creation procedure was performed in cooperation with the Public Power Corporation (PPC), which is the obligated party with the largest share of the energy efficiency target. According to the applied changes, it was decided to distinguish the role of the landlords and tenants, to pinpoint the contribution of the heat pumps to the building value increase and to provide specialized advice to landlords and tenants separately through the application of ΔΕΗ myEnergyCoach. ΔΕΗ myEnergyCoach is a mobile application offered by the Public Power Corporation in Greece. It is designed to help consumers manage and monitor their electricity consumption more efficiently.

All the aforementioned changes are depicted in the following figure, which presents the information material that was distributed in 2022 during the awareness raising activities by PPC within the framework of the EEOs.



Εξοικονομήστε χρήματα από το σύστημα θέρμανσης του σπιτιού σας, τον χειμώνα που έρχεται.

Είτε είστε ενοικιαστές, είτε ιδιοκτήτες, μπορείτε να εξοικονομήσετε χρήματα αλλάζοντας συνήθειες στο τρόπο θέρμανσής σας, προστατεύοντας την τσέπη σας και το περιβάλλον.

Σύγκριση τρόπων θέρμανσης:

Χαρακτηριστικά / Τεχνολογία	Λέβητας Πετρελαίου	Λέβητας Αερίου	Αντλία Θερμότητας
Βαθμός Απόδοσης	80%	95%	300-500%
Κατανάλωση ενέργειας	10.150 kWh	8.547 kWh	3.007 kWh
Παραγωγή CO_2	2.487 kg	1.667 kg	1.444 kg
Κόστος Θέρμανσης Σεπτεμβρίου	1.360 €	1.846 €	640 €
Δυνατότητα Σύνδεσης με ηλιακό	✓	✓	✓
Δυνατότητα Σύνδεσης με Φωτοβολταϊκό	–	–	✓

* Παράδειγμα σύγκρισης συστήματος για λειτουργία θέρμανσης, σε διαμέρισμα 80 τ.μ. στην Αθήνα, κατασκευής 2000.
** Τιμές καυσίμων, για τον μήνα Σεπτέμβριο.
*** Η τιμή ηλεκτρικού ρεύματος περιλαμβάνει ρυθμιζόμενα κόστη και κρατική επιδότηση.

Τι καταλαβαίνουμε από τα στοιχεία του πίνακα:

- ✓ Η αντλία θερμότητας έχει τον καλύτερο βαθμό απόδοσης σε σχέση με τον λέβητα πετρελαίου και αερίου, δηλαδή η 1 kWh ενέργειας μετατρέπεται σε 3 kWh θέρμανσης, ενώ η 1 kWh πετρελαίου μετατρέπεται σε 0,8 kWh θέρμανσης.
- ✓ Το πετρέλαιο και το φυσικό αέριο είναι γαιάνθρακες, ενώ η ηλεκτρική ενέργεια που χρησιμοποιείται από την αντλία θερμότητας παράγεται από ένα μίγμα καυσίμων, το οποίο είναι πιο φιλικό προς το περιβάλλον, καθώς το 2021 το 41,5%* της παραγωγής ηλεκτρικής ενέργειας στην Ελλάδα παράχθηκε από ΑΠΕ.
- ✓ Χρησιμοποιώντας αντλία θερμότητας ως μέσο θέρμανσης, εκπέμπονται λιγότεροι ρύποι σε σύγκριση με το πετρέλαιο και το φυσικό αέριο αντίστοιχα.

* Μίγμα παραγωγής της χώρας για το 2021: ΔΑΠΕΕΠ.

Επιλέξτε αντλία θερμότητας

Αν αναζητάτε έναν πιο αποδοτικό τρόπο θέρμανσης, που είναι φιλικός προς το περιβάλλον και θα αναβαθμίσει την αξία του κτηρίου σας, η καλύτερη λύση είναι η αντλία θερμότητας.

Χρησιμοποιώντας την ειδικά σχεδιασμένη εφαρμογή αντλιών θερμότητας, θα βρείτε την αντλία που ταιριάζει στις ανάγκες σας και θα λάβετε προσωποποιημένες προτάσεις εγκατάστασης. Μάθετε περισσότερα στο dei.gr

Επιπλέον η ΔΕΗ, σας επιβραβεύει με 500€ για αγορά αντλίας θερμότητας με το προϊόν ρεύματος ΔΕΗ της επιλογής σας.

Αν επιλέξετε να παραμείνετε στο υφιστάμενο σύστημα θέρμανσης, δείτε τις παρακάτω συμβουλές για πιο αποδοτική, βιώσιμη και οικονομική θέρμανση:

- ✓ Κρατήστε τον θερμοστάτη σε σταθερή θερμοκρασία και μην τον ρυθμίζετε πάνω από τους 21ºC.
- ✓ Μην καλύπτετε τα θερμαντικά σώματα με καλύμματα, γιατί μειώνεται σημαντικά η απόδοσή τους.
- ✓ Σε χώρους που δεν χρησιμοποιείτε, απομονώστε τα θερμαντικά σώματα και κλείστε τις πόρτες, ώστε να μην έχετε απώλεια θερμότητας.
- ✓ Μην παραλείπετε να κάνετε συντήρηση στο σύστημα θέρμανσης, κάθε χρόνο.
- ✓ Κάντε εξαέρωση των θερμαντικών σωμάτων μια φορά τον χρόνο, στην αρχή της περιόδου θέρμανσης.

Θέλετε περισσότερες συμβουλές εξοικονόμησης;

ΔΕΗ myEnergyCoach!

Ο προσωπικός σας σύμβουλος με λύσεις εξοικονόμησης ενέργειας και κόστους για το σπίτι.

Μάθετε περισσότερα στο dei.gr

Figure 9: Information material distributed in 2022 during the awareness raising activities in Greece by PPC

5.2.3 Description of the implementation process

The “Energy upgrade of buildings” programme was launched in the middle of December 2021, entitled as “Exoikonomo 2021” programme, with the reception of applications submitted by the eligible households. A predefined period for submitting the applications was given to the interested energy poor households, while after its completion the evaluation phase was started. The evaluation phase will be completed within the middle of 2023, giving the opportunity to estimate the actual number of the energy poor households, who dwell in rented residences and manage to be supported by the pilot policy.

The new round of the EEO scheme started in June 2022, fostering the implementation of the energy efficiency interventions in energy poor households. According to the operational framework , the energy-saving units delivered by technical measures can be increased by a factor of 1.4, while the respective increase for targeted information and awareness-raising measures can be equal to 1.1. Various targeted information and awareness-raising measures by the obligated parties were conducted within 2022, while their outcomes were submitted in January 2023 to the administrator of the scheme for control and verification.

Finally, the procedures for measuring, monitoring, controlling and verifying the delivered energy savings will be accomplished by the respective administrator within May 2023.

5.2.4 Role of the REACT group in the implementation

The contribution of the REACT group consisted of the following activities within the framework of "Energy upgrade of buildings":

- Provide guidance to the interested households about the critical steps during the application process maximizing the possibility for an energy poor household to be supported by the programme.
- Develop a methodology for quantifying the delivered benefits both to landlords and tenants according to the provisions of the programme.
- Monitor the progress of the programme in relation to the alleviation of energy poverty in the PRS.
- Assess the effectiveness of the programme in relation to the alleviation of energy poverty in the PRS.
- Formulate recommendations for the re-design of the programme in relation to the alleviation of energy poverty in the PRS.
- Assist the dissemination of the triggered results by the implemented programme.

Two target group meetings were organised (15th September 2022 and 22nd December 2022) with the participation of the Ministry of Environment and Energy in order to discuss the progress of the "Exoikonomo 2021" programme and to assess its contribution to the alleviation of energy poverty in the PRS in Greece.

Similarly, the REACT group within the framework of the EEO scheme could contribute to the materialization of the following activities:

- Provide guidance to the development of targeted information and awareness raising material according to the needs and priorities of energy poor households.
- Monitor the progress of the scheme in relation to the alleviation of energy poverty in the PRS.
- Assess the effectiveness of the scheme in relation to the alleviation of energy poverty in the PRS.
- Formulate recommendations for the re-design of the scheme in relation to the alleviation of energy poverty in the PRS.

- Assist the dissemination of the triggered results by the implemented scheme.

Two target group meetings were organised (19th October 2022 and 23rd November 2022) with the participation of PPC in order to co-design the utilised information material within the targeted information and awareness raising activities.

Finally, a REACT group meeting was carried out also on 14th February 2023 with the partcipation of 25 stakeholders from 16 different organizations in order to assess the progress of the ENPOR project in regards the effectiveness of the re-designed pilot policies.

5.2.5 Risks and challenges in the implementation of the policy/measure

The difficulty to identify and support energy poor households that dwell in rented residences constitutes the main challenge during the implementation of the “Energy upgrade of buildings” programme. Obviously, the provision of a 40 % subsidy to the landlords is indisputably towards the right direction without guaranteeing in any case that it will contribute to the radical alleviation of the energy poverty problem. In this case the inclusion of the tenants as a distinct social criterion should be applied during the re-design of the programme facilitating the radical mitigation of the problem.

Moreover, the development of a methodology for quantifying the delivered benefits both to landlords and tenants according to the provisions of the “Energy upgrade of buildings” programme was rather challenging due to the fact that the required information about the delivered energy savings and the costs of the planned energy efficiency interventions is not available. Obviously, the participation of representatives from the authority, which is responsible for the coordination of the “Energy upgrade of buildings” programme will ensure the provision of the required data. It should be noted that the calculation procedure can be complex, while it is essential to ensure that all the calculations will be implemented through a transparent and simplified approach.

Last but not least, it is critical that the implementation of the “Energy upgrade of buildings” programme does not to lead to the appearance of the “renoviction” phenomenon (the eviction of all of a building's tenants on the grounds that a large-scale renovation is planned) in Greece. The continuous monitoring of the programme is imperative, while precautionary measures should be carried out in order to avoid both the appearance and the gradual magnification of the phenomenon.

For the case of the EEO scheme, the difficulty to design targeted information and awareness-raising material and tools is considered the most important risk due to the limited knowledge about the energy poverty phenomenon and the difficulty to approach energy poor households. Therefore, it should be ensured that the developed material and tools will be suitable according to the needs and priorities of the energy poor households in the PRS. The involvement of both energy and communication experts facilitated the development of understandable material and user-friendly tools and the effective conduction of the planned measures.

The development of a methodology for the effective monitoring of the pilot policies’ progress and

the evaluation of their effectiveness in regards to the alleviation of energy poverty in the PRS has been facilitated with the provision of the required data from the involved authorities. The delivered multiple benefits should be quantified, while the participation of energy poor households into the pilot policies will be facilitated in the case that trust will be created among all the affected parties and the acceptance of the planned policies and measures will be unanimous by all the involved stakeholders. The alleviation of energy poverty should constitute a mutual target of all citizens and only the initiation of targeted policies and measures will ensure the confrontation of the energy poverty problem not only generally but more focused on the PRS.

5.2.6 Implementation results and lessons learned

The formulated proposals for the re-design of the pilot policies were assessed as rather effective by the REACT group contributing to the alleviation of energy poverty. Firstly, the "Energy upgrade of buildings" programme managed to support a higher number of energy poor households mainly due to the dedicated budget for them within the RRF plan, while according to the preliminary results, the number of rented houses, which was supported financially, was higher compared with the previous rounds due to the fact that a distinct aid was foreseen for them.

Moreover, the implementation of a targeted awareness raising campaign by PPC within the framework of the EEOs improved not only the increased understanding of the energy poverty phenomenon, but supported energy poor households in purchasing a heat pump.

The finalised proposal for the case of the "Energy upgrade of buildings" programme foresees the inclusion of the tenants as a distinct social criterion, while the provided public aid must be calculated taking into account the shared benefits among landlords and tenants. Furthermore, the deep energy renovation must be supported so as to ensure that the phenomenon of energy poverty will be tackled on a long-term basis. Finally, a dedicated budget within the "Energy upgrade of buildings" programme must be allocated for supporting energy poor households, who dwell in rented buildings.

Correspondingly, the finalised proposal for the case of the EEOs foresees the conduction of targeted information and awareness-raising activities by the energy suppliers providing useful and effective guidance to energy poor households, which dwell in rented- buildings, so as to confront the phenomenon of energy poverty. Moreover, it is recommended to combine the EEOs with the alternative measures ensuring that the energy efficiency interventions will be implemented with the most cost-effective approach. The identification and participation of energy poor households must be facilitated providing the capability to the obligated parties to approach them with no obstacles. Finally, the information and awareness-raising activities can be accompanied with the provision of economic support for the installation of energy efficient heating and cooling systems, such as heat pumps.

Both pilot policies will continue to contribute to the alleviation of energy poverty in Greece. It should be noted that they have already been integrated into the Greek action plan for the alleviation of energy poverty, while their revision through the co-creation procedure as resulted by

the REACT group will facilitate the confrontation of energy poverty in the PRS.

Despite the fact that the evaluation of the pilot measures has not been completed yet, it is estimated that the “Energy upgrade of buildings” programme will manage to affect approximately 13 thousand households. Similarly, the targeted awareness raising campaign conducted by the PPC will affect approximately 165 thousand households.

The involvement of new stakeholders was not observed, confirming the initial effectiveness of their selection. In terms of lessons learned, the main barrier in Greece is the low awareness among households. The implementation of financing schemes to support both landlords and tenants is critical in addressing energy poverty in the private rented sector. Additionally, the redesign of the required measures with active citizen involvement is essential for effectively alleviating energy poverty in the PRS.

In general, energy renovation of buildings is the most effective option for addressing energy poverty in the PRS. However, introducing regulatory measures is not an easy task due to the importance of avoiding market distortions and the difficulty of involving all responsible public authorities.

The REACT group's contribution has been beneficial in providing technical expertise to address the split incentive problem in Greece. The involved public authorities should receive support from the REACT groups, which could be maintained as a permanent network.

Finally, the role of municipalities is crucial in identifying energy poor households. Establishing a one-stop shop is imperative for addressing energy poverty, with active involvement from social companies, social services, and municipalities.

6 IMPLEMENTATION OF ENPOR POLICIES AND MEASURES IN CROATIA

6.1 National policy framework in relation to energy poverty, especially with regard to the private rental sector, and changes since the start of the project

Baseline of energy poverty in the private rented sector in Croatia

According to Eurostat 2019, 89.7 % of the Croatian population lived in a household owning their home while the remaining 10.3 % lived in rented housing.

Table 3: Croatia's tenure type in 2019

	Owner [%]	Tenant [%]
Croatia	89,7	10,3
EU 27	69,8	30,2

Observing the indicator by tenure type (owners, private tenants, and social housing) from Eurostat's EU-Statistics on Income and Living Conditions (EU-SILC) in 2017, problems with arrears on utility bills were significant in social housing, followed by households inhabited by owners, then private tenants. The inability to keep their house warm was significant for private tenants and in the social housing sector, followed by owners.

Table 4: Croatia's energy poverty indicators by tenure type in 2017

		EU 27 [%]	Croatia [%]
Average	arrears on utility bills	7.0	21.0
	inability to keep their house warm in social housing	7.8	7.4
Owners	arrears on utility bills	5.6	20.0
	inability to keep their house warm in social housing	6.4	6.7
Private rents	**arrears on utility bills**	**9.0**	**15.2**
	inability to keep their house warm in social housing	**10.0**	**17.1**
Social housing	arrears on utility bills	13.0	33.6
	inability to keep their house warm in social housing	13.2	13.4

Generally, apartments or houses for rent were mainly out of policy focus due to a lack of national data and so-called free-based tenancy, which always includes two separate families/households in the same dwelling. Those groups have not been targeted yet and thus there are no statistics on extended families living in a joint household.

An unregulated market and unresolved property legal relations contribute to the problem of lack of national data and the lack of transparency in the market.

Additionally, in Croatia, where the tourism sector is one of the most important branches of the

economy, private rent as a short-term rent brings large profits to landlords and creates severe problems for tenants, primarily in the Adriatic region of Croatia due to many leases being cancelled during the summer. This problem mostly affects students studying at colleges located on the Adriatic Coast.

Policy framework for energy poverty in Croatia

In Croatia, energy poverty is not clearly defined, nor general criteria or methodologies for determining energy poverty have been established so far. Nevertheless, energy poverty exists as a term in the Energy Efficiency Act and in two programs for renovation – namely “Program for alleviation of energy poverty, which includes the use of renewable energy sources in residential buildings in areas of special state until 2025” and “Program for energy renovation of multi-apartment buildings for the period up to 2030”. Both of these programs are part of the ENPOR project as pilot policies in Croatia. They were implemented by the government following the start of the ENPOR project.

The definition of an energy-vulnerable household in the regulation on criteria for acquiring the status of vulnerable energy customers from networked systems does not take into account all aspects of vulnerability, and the status of vulnerable energy customer only applies to electricity but would be more beneficial if it included other forms of energy (e.g. heat) as well. In addition, Croatia does not currently have an established system for monitoring energy poverty, which is why there is no clear insight into the real situation of energy poor households.

In deliverable D3.2, titled "Working document on the implementation of the ENPOR policies," the state of implementation of the policies and measures in the ENPOR project was documented at the end of 2021. It is worth noting that the energy crisis had already taken hold during the pandemic year of 2021, with the prices of several energy sources rising. However, Croatian citizens did not feel the impact of the price increases in 2021, possibly due to the government's ability to manage these prices through various mechanisms.

The Russian invasion of Ukraine in February 2022 exerted additional pressure on the escalating energy prices, and the government could no longer contain the price hikes. Consequently, both the price increases from 2021 and 2022 started affecting the citizens. Several factors contributed to the energy crisis in Croatia, including the COVID-19 pandemic, the war in Ukraine, inflation, and Croatia's entry into the Eurozone.

In response to the energy crisis in 2022, the Croatian government pursued two main strategies: price limitations on energy and the revision of existing policies.

Table 5: Croatia's policy framework for energy poverty

Key national policies	Name of policy affecting energy poverty	Coordinating authority	Short description
National recovery and resilience plan (NPOO)	/	All ministries	• 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 last earthquake in Croatia including energy renovation.
Energy Act (Official Gazette, No. 120/12, 14/14, 102/15, 68/18)	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)	Ministry of Labor, Pension System, Family and Social Policy	• Co-financing of electricity costs to a maximum of 66 EUR per month (500 HRK per month) • Solidarity fee paid by electricity customers from the household category in the amount of 0.004 EUR (0.03 HRK) for each kWh of electricity consumed
Energy Act (Official Gazette, No. 120/12, 14/14, 102/15, 68/18	2015 Agreement of Cooperation in Combating Energy Poverty Measures	Ministry of Economy and Sustainable Development	The agreement on cooperation in measures to combat energy poverty by which HEP took over the costs of solidarity compensation, was established by an agreement between the government of the Republic of Croatia and suppliers and may expire at any time.
Energy Act (Official Gazette, No. 120/12, 14/14, 102/15, 68/18)	Conclusion regarding compensation for reducing the impact of the rise in energy prices on nursing homes (Official Gazette, No. 100/2020)	Ministry of Labor, Pension System, Family and Social Policy	Co-financing of electricity costs to a maximum of 66 EUR per month (500 HRK per month)
Energy Act (Official Gazette, No. 120/12, 14/14, 102/15, 68/18)	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)	Ministry of Economy and Sustainable Development	Definition of the status of "vulnerable customer"
Energy Act (Official Gazette, No. 120/12, 14/14, 102/15, 68/18)	Regulation on the criteria for acquiring the status of a protected customer in conditions of crisis in gas supply (Official Gazette, number: 65/2015)	Ministry of Economy and Sustainable Development	• Definition of "protected customer" • The regulation aims to protect specific categories of end users during a gas supply crisis by ensuring that required quantities of gas are allocated to all protected customers and distributed among suppliers.

Key national policies	Name of policy affecting energy poverty	Coordinating authority	Short description
Electricity Market Act (Official Gazette, Nos. 22/13, 102/15, 68/18, 52/19)	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)	Ministry of Economy and Sustainable Development	Owners of production plants for electricity are obliged to pay compensation to the premises where power plants are built to local self-government units à municipalities and cities, which should be used for social welfare programs
Energy Efficiency Act (Official Gazette, No. 127/14, 116/18, 25/20)	Regulation on the obligation system of energy efficiency (Official Gazette, No. 41/2019)	Ministry of Economy and Sustainable Development	The fee for vulnerable energy customers (in accordance with the regulation on social welfare) is increased by 20 % for an energy-saving customer or 10 % for residential energy-saving customers
Social Welfare Act care (OG 157/13, 152/14, 99/15, 52/16, 16/17, 130/17, 98/19)	The Guaranteed Minimal Support programme (Social Welfare Act (Official Gazette, number: 157/13, 152/14, 99/15, 52/16, 16/17, 130/17, 98/19, 64/20, 138/20)	Ministry of Labour, Pension System, Family and Social Policy	The right to financial assistance for a single person or a household to meet their basic living needs. The guaranteed minimum financial assistance is used for housing costs which **include rent**, utility bills, electricity, gas, heating, water, drainage, etc. The right to guaranteed minimum financial assistance is granted to a single person or a household that does not have enough funds to meet basic life needs.
Social Welfare Act care (OG 157/13, 152/14, 99/15, 52/16, 16/17, 130/17, 98/19)	Decision on the basis for calculating the amount of the minimum fee (Official Gazette, No. 157/2013)	Ministry of Labor, Pension System, Family and Social Policy	Guaranteed minimum financial assistance of 800.00 HRK (107 EUR) Single parent à 100 % (800.00 HRK) for an adult member of the household à 60 % (480.00 HRK = 64 EUR) for a child à 40 % (320.00 HRK = 43 EUR) and for a child of a single parent à 55 % (440.00 HRK = 59 EUR) Eligible are single persons or households using wood for heating (3 m^3 of wood or approved monetary amount to cover that cost)
A long-term strategy for the renovation of the national building stock until 2050	Programme of energy renovation of family houses 2014 – 2020 – the programme is planned to continue according to the Energy Renovation Programme for Single-family Houses 2021-2027	Environmental Protection and Energy Efficiency Fund	As part of this program, 3 public calls for family houses and 2 special calls have been done since 2014: • One special call for energy poor households and one for households affected by the earthquake. • "Public call for energy renovation of family houses for vulnerable groups of citizens at risk of energy poverty" was opened in 2020, and included only citizens already targeted by welfare system 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.

Key national policies	Name of policy affecting energy poverty	Coordinating authority	Short description
A long-term strategy for the renovation of the national building stock until 2050	Program for energy renovation of multi-apartment buildings for the period up to 2030 - Decision (Official Gazette, No. 143/2021)	Environmental Protection and Energy Efficiency Fund	Introduction of the concept of energy poverty, but not the national definition of energy poverty. The first public call from this program was opened in April 2022. In the previous program that lasted from 2014-2,020 there was only one public call in 2015. The second public call was opened in 2022 as part of the new program.
Long-term strategy for the renovation of the national building stock until 2050	Program for alleviation 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)	Ministry of Spatial Planning, Construction and State Property	Introduces the concept of energy poverty, but not the national definition of energy poverty. HRK 150 million (19.957.418 €) from the 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.
Zagreb's strategy for the fight against poverty and social exclusion for the period from 2021 to 2025	/	City of Zagreb	A measure to address energy poverty is to provide energy packages (boxes) to beneficiaries entitled to compensation for housing costs.
Program to reduce energy poverty in the area of the City of Zagreb for the period until 2030	/	City of Zagreb	Measures included in the program are: 1. Establishment of a system for collecting and monitoring data on energy poverty 2. Energy consulting 3. Energybox 4. Replacement of household appliances 5. Energy renovation of multi-apartment buildings 6. Energy renovation of family houses 7. Funding of renewable energy sources 8. Construction of a green and integrated housing fund for social housing

Key national policies	Name of policy affecting energy poverty	Coordinating authority	Short description
Action Plan for Energy and Climate Sustainable Development (SECAP)- Osijek	/	City of Osijek	Energy poverty measures are also included in this SECAP: • 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	/	City of Zadar	Energy poverty measures are also included in this SECAP: • 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	/	City of Rijeka	Energy poverty measures are also included in the this SECAP: • 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 energy poor households
Climate Change and Ozone Protection Act (Official Gazette, No. 127/19)	The act establishes a new plan for the use of funds obtained from the sale of emission allowances.	Ministry of Economy and Sustainable Development	Measures to combat energy poverty will be co-financed with funds obtained from the sale of emission allowances through auctions.
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)	/	Ministry of Economy and Sustainable Development	• 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. • A VAT rate of zero percent is being introduced for the delivery and installation of solar panels on private residential buildings, residential premises, and public and other buildings. • No limited time on 0 % VAT for solar systems.
/	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)	Ministry of Labor, Pension System, Family and Social Policy	In 2022, a one-time decision was made to provide energy compensation to 690,000 pensioners whose pensions amount to up to HRK 4,360 (€578.67). The total value of this measure is HRK 450 million (€59.7 million).

Key national policies	Name of policy affecting energy poverty	Coordinating authority	Short description
/	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)	Ministry of Labor, Pension System, Family and Social Policy	In 2022, a one-time decision was made to provide energy compensation to beneficiaries of child support. The specific amount of compensation depends on the number of children.
/	Decision on the number of tariff items for guaranteed electricity supply (Official Gazette, No. 100/200)	/	• 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
Act on Write-Off of Debts to Natural Persons (Official Gazette, No. 62/2018)	Public Call for debt write-offs	Croatian Electricity Company (HEP)	• Writes off debts to persons up to the maximum amount of debt of HRK 5,000 (660 Euro) in 2018 • Only for the area affected by the earthquake in 2020 in Sisak Moslavina County.

Policy framework for the private rented sector in Croatia

Table 6: Croatia's policy framework for the private rented sector

Key national policies	Coordinating authority	Short description
Lease of Apartments Act (Official Gazette, No. 91/96, 48/98, 66/98, 22/06, 68/18, 105/20)	Ministry of Physical Planning, Construction and State Assets	The law includes articles that define: general provisions, rent, obligations of the landlord, obligations of the tenant, rights of the tenant, termination of the lease agreement, death or termination of the contracting parties, list of lease agreements or deeds of the apartment, enforcement provision and so on.
Law on Obligations (Official Gazette, 35/05, 41/08, 125/11, 78/15, 29/18)	Ministry of Physical Planning, Construction and State Assets	The law includes articles that define: the lessor is obliged to make the necessary repairs in a timely manner at his own expense, and the lessee is obliged to allow this.
Law on Catering Activity (Official Gazette, 85/15, 121/16, 99/18,	Ministry of Tourism and Sport	Among other activities related to the tourism sector, it regulates private tourist rent.

Key national policies	Coordinating authority	Short description
25/19, 98/19, 32/20, 42/20)		

The link between the policy framework for energy poverty in Croatia and the policy framework for the private rented sector in Croatia

There is no direct link between policies related to energy poverty and policies related to the private rental sector, but the form of housing (own real estate, private rent, or social housing) is not a key factor in obtaining rights such as:

- co-financing of electricity costs to a maximum of 200 HRK per month (26.39 euro per month)
- guaranteed minimum financial assistance,
- single person or household - using wood for heating (3 m³ of wood or approved monetary amount to cover that cost)
- writes off debts to persons up to the maximum amount of debt of HRK 5,000 (660 Euro)

One of the articles in the Lease of Apartments Act (Official Gazette, No. 91/96, 48/98, 66/98, 22/06, 68/18, 105/20) contains a sub-clause that defines that the landlord hands over the apartment to the tenant in a condition suitable for living but it is not defined which conditions are suitable for living, so the energy efficiency of the rented space is not mentioned.

As part of the long-term strategy for the renovation of the national building stock until 2050 under the programme of energy renovation of family houses 2014 – 2020, there was a public call in 2020: *Public call for citizens to finance the energy renovation of family houses for vulnerable groups of citizens at risk of energy poverty*. One of the criteria outlined was the state of ownership of the real estate (i.e. the applicant had to live at the address of the building which would apply for the tender) resulting in the exclusion of other categories of vulnerable groups and citizens at risk of energy poverty or energy poor citizens. Furthermore, this call was only meant for single-family houses and excluded multi-apartment buildings. This is problematic as citizens living in apartment buildings, including vulnerable groups, are left out in this financial scheme. This issue was addressed at all meetings of the REACT group and the target group meetings because the private rented sector makes up the largest share in multi-apartment buildings in Croatia.

Changes since the start of the ENPOR project

As part of the long-term strategy for the renovation of the national building stock until 2050, there

will be a continuation of the National Programme for Renovation of Buildings in the total amount of HRK 400 million (~52,630,000 EUR) that is in the financial plan of the Environmental Protection and Energy Efficiency Fund for 2021 and projections for 2022 and 2023. According to the plan, funds are ensured for the 2021 and 2022 period but not for 2023. The fund predicts that HRK 121 million (~15,921,000 EUR) will be secured by the distribution of surplus revenue in 2021 and will probably be allocated to 2023 and thus the total amount of HRK 400 million (~52,630,000 EUR) for the period 2021-2023 will be achieved.

It should also be emphasized that the criteria of damage to a house in an earthquake in 2020 will also be taken into account when allocating the funds of HRK 400 million (~52,630,000 EUR):

- HRK 300 million (~39,474,000 EUR) are intended for co-financing the energy renovation of family houses that were not damaged in the earthquake in 2020, on the entire territory of the Republic of Croatia, and
- HRK 100 million (~13,158,000 EUR) is intended for co-financing the energy renovation of family houses damaged in the earthquake in 2020, after the implementation of structural reconstruction and/or after repairs of non-structural elements, i.e. in parallel with each other

Table 7: Croatia's original plan of the implementation of policies during the ENPOR project (2020-2023)

Year	Type of programme	Type of call	Number of households	Grant
2021	Programme of energy renovation of **family houses**	Public call for all citizens	TBD	185,000,000 HRK (~24,345,000 EUR)
2022	Programme of energy renovation of **family houses**	TBA	TBD	50,000,000 HRK (~6,580,000 EUR)
2023	TBA	TBA	TBD	121,000,000 HRK (~15,921,000 EUR)
Total			TBD	400,000,000 HRK (~52,630,000 EUR)

Since the description of the implementation progress in D3.2 at the end of 2021, five calls for renovation were opened, which is more than originally planned. The reason for this is that the government decided to separate the public call, which previously included subsidies for energy renovation and installation of renewable energy sources, into two separate calls.

Now, there is a call specifically for energy renovation (including heating) and another call for subsidies for the installation of renewable energy sources (including heating).

The planned public call for family houses mentioned in Table 7 was opened and closed because all the subsidy grants had been allocated for family house renovation. Additionally, there was a call opened to target local authorities responsible for mapped buildings included in the "Program for alleviation of energy poverty, which includes the use of renewable energy sources in residential buildings in areas of special state until 2025." Although this call is not shown in Table 7, it is worth noting that it took place.

Table 7 indicates the planned public call for family houses, and indeed, there were two public calls in the end. The first call was specifically for houses damaged in the earthquake, titled "Public call for energy renovation of family houses damaged in the earthquake." The second call focused on the installation of renewable energy sources (including heating) and was titled "Public call for encouraging renewable energy sources in family homes." This separation of energy renovation and renewable energy source installation into two distinct calls was previously mentioned.

What was not initially planned in Table 7, but nevertheless took place, was the opening of a public call for energy renovation of multi-apartment buildings. This call came after a period of seven years without any renovation calls specifically targeting multi-apartment buildings.

Table 8 presents the updated plan for the implementation of policies during the ENPOR project (2020-2023). In Table 7, it was initially planned to allocate 30,925,800 EUR for the years 2021 and 2022. However, the actual expenditure amounted to approximately 139,441,397 EUR, representing a significant increase in funding of 450 %.

Table 8: Updated Croatia's plan of the implementation of policies during the ENPOR project (2020-2023)

Year	Type of programme	Type of call	Number of households	Grant	Time
2021	Programme of energy renovation of **family houses**	Public call for all citizens	TBD	390,000,000.00 HRK (51,761,895 EUR)	Call closed
2022	Programme of energy renovation of **family houses**	Public call for energy renovation of family houses damaged in the earthquake	TBD	100,000,000 HRK (13,272,280 EUR)	Call closed
2022	Programme of energy renovation of **family houses**	Public call for encouraging renewable energy sources in family homes	TBD	95,000,000 HRK (12,608,666 EUR)	Call closed
2022	Programme of energy renovation of **multi-apartment buildings** for the period 2021 – 2030	Public call for co-financing of energy renovation of multi-apartment buildings	TBD	330,000,000 HRK (43,798,526 EUR)	Call closed
2022	Programme for alleviation of energy poverty, which includes the use of renewable energy sources in residential buildings in	Target calls for mapped areas in this programme	387 buildings until 2025 (7 implementation started in 2022)	N/A	On-going

Year	Type of programme	Type of call	Number of households	Grant	Time
	areas of special state until 2025				
2023	Programme of energy renovation of **family houses**	Public call encouraging the use of renewable energy sources	TBD	13,781,925 EUR	TBD
2023	Programme of energy renovation of **family houses**	Public call for energy renovation of family houses	TBD	29,477,730 EUR	TBD
2023	Programme for alleviation of energy poverty, which includes the use of renewable energy sources in residential buildings in specific areas until 2025	Target calls for mapped areas in this programme	387 buildings until 2025	59,725,260 EUR	TBD
Total			TBD	224,426,282 EUR	

6.2 National Programme for Renovation of Buildings – HR

6.2.1 Description of the measure prior to the ENPOR co-creation process

The **National Programme for Renovation of Buildings for the period 2014-2020** aimed to undertake renovation activities, ensuring that part of the benefited households are those in energy poverty. The programme is implemented through four programmes, but our focus is on the following two main programmes:

1. **"Programme of energy renovation of family houses 2014 – 2020"**[13]: In 2020 there was an amendment to the programme – *A public call for citizens to finance the energy renovation of family houses for vulnerable groups of citizens at risk of energy poverty* – with 20 % of the total funds (28.4 million HRK = 3.79 million EUR) that was set aside for such vulnerable groups of citizens

2. **"Programme of energy renovation of multi-apartment buildings for the period 2014 – 2020"**[14]

At the time of writing the ENPOR proposal and since the last analysis of D3.2 in 2021, the 2014-2020 programs have been completed, but they are still ongoing under the **National Programme for Renovation of Buildings for the period 2021-2030**. This program is being implemented through

[13] https://narodne-novine.nn.hr/clanci/sluzbeni/2020_05_57_1146.html
[14] https://mpgi.gov.hr/o-ministarstvu/djelokrug/energetska-ucinkovitost-u-zgradarstvu/energetska-obnova-zgrada-8321/energetska-obnova-visestambenih-zgrada-8323/8323

various initiatives, but our attention is primarily directed towards these three key programs:

1. Programme for alleviation of energy poverty, which includes the use of renewable energy sources in residential buildings in areas of special state until 2025 (Official Gazette, No. 143/2021

2. Programme for energy renovation of multi-apartment buildings for the period up to 2030 (Official Gazette, No. 143/2021)

3. Programme of energy renovation of family houses 2014 - 2020 – the programme is planned to continue according to the Energy Renovation Programme for Single-family Houses 2021-2027

So far, there have been two periods of implementation of the Renovation Program 2014-2020 and 2021-2030:

- **Program for the 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 the energy renovation of family houses for the period from 2014 to 2020 with a detailed plan for the period until the end of 2020"): Under this program, there were three calls for the general public for family houses and two specific calls – one for energy poor households and one for households affected by the last earthquake. In 2020, a "Public call for citizens at risk of energy poverty for the energy renovation of family houses for vulnerable groups of citizens at risk of energy poverty" was opened. However, this call only included citizens who were already targeted by the welfare system, excluding other categories of vulnerable groups and citizens at risk of energy poverty or energy poor citizens. The funds for the program are provided through the financial plan (ETS system) of The Environmental Protection and Energy Efficiency Fund.

- **Program for the energy renovation of multi-apartment buildings for the period up to 2030** ("Decision on the adoption of the Program for the energy renovation of multi-apartment buildings for the period up to 2030" [Official Gazette, No. 143/2021]): This program aims to cover the energy renovation of both undamaged and earthquake-damaged multi-apartment buildings, to reduce energy consumption and enhance the safety and resilience of existing structures. The estimated investment required for implementing this measure is HRK 17.2 billion. The program also includes green infrastructure measures that help decrease building heating and mitigate heat islands in cities. Since 2014, there have been two calls for the general public for renovating multi-apartment buildings under this program.

- **Program for the alleviation of energy poverty, incorporating the utilization of renewable energy sources in residential buildings in assisted areas and areas of special state concern for the period 2021-2025** (Official Gazette, No. 143/2021): This program aims to significantly mitigate energy poverty while promoting the well-being of tenants, employment

opportunities, spatial planning, and an increase in real estate values. The program emphasizes the utilization of renewable energy sources, primarily photovoltaic systems, with a total capacity that can generate approximately 4,360 MWh of electricity per year for on-site consumption, resulting in a reduction of approximately 691 tons of CO_2 emissions annually. The entire implementation of the program, planned for the specified period, will require HRK 150 million (€19,957,418) from the NPOO (National Program for the Development of Education) and HRK 205 million (€27,275,139) from the state budget. The program encompasses the renovation of 387 residential buildings, with 100 % of the renovation costs intended to be funded. The program has already initiated an open public call and has commenced implementation for seven out of the 32 buildings in Lika Osik. An additional 80 buildings in other local communities are scheduled for renovation in 2022/2023.

6.2.2 Changes to the measure resulting from the co-creation with the national REACT group

During the implementation of the ENPOR project, two new Programs were launched, and for those two programs a public consultation was opened, to which DOOR responded in the form of official statements with comments:

1. Program for alleviation of energy poverty, which includes the use of renewable energy sources in residential buildings in areas of special state until 2025 (Official Gazette, No. 143/2021)

2. Program for energy renovation of multi-apartment buildings for the period up to 2030 (Official Gazette, No. 143/2021)

The documents introduce the concept of energy poverty; however, there is currently no national definition, criteria, or framework for measuring the impact of the measures outlined in the program.

A positive aspect is the inclusion of 387 buildings in the mapping process within the “Program for alleviation of energy poverty, which includes the use of renewable energy sources in residential buildings in areas of special state until 2025” (Official Gazette, No. 143/2021). These buildings are scheduled to be renovated by the end of 2025. However, a drawback is that some of these buildings were mapped before the significant earthquake that struck certain areas in Croatia in 2022. Consequently, they now require substantial investment in strengthening measures.

Regarding collaboration and co-creation, the ENPOR project, along with the REACT and target groups, has established cooperation with one of the cities participating in the program through an upcoming project, set to begin in 2023. The project aims to establish offices that will assist citizens in the energy renovation of buildings included in the adopted program.

Additionally, the cities that were part of the REACT and target groups, and where surveys were conducted, will receive their own reports containing data on the private rental sector and energy poverty within their respective areas. The proposed measures will be linked to existing renovation programs. The cities and municipalities that will receive ENPOR policy co-design are the City of

Zagreb, the City of Zadar, the City of Križevci, and the Municipality of Buševec.

6.2.3 Description of the implementation process

When organising the first REACT group meeting, the idea was to stimulate different institutions to create the criteria for energy poverty and to begin to monitor the progress of the energy poverty measures. It was suggested to start using an ICT tool like an Energy Management Information System (EMIS) that is under the jurisdiction of the Agency for legal transactions and real estate brokerage (ApN – a member of REACT group). As one of the measures to improve the program, it was proposed that households which will be funded through the public all enrol in the ICT tool so that monitoring of the progress of the energy poverty measures could be done.

By organizing the first target group meeting, as well as the second and third REACT group meeting, it was agreed that the survey/analysis that will be conducted through the other three projects (BušEko ?! for the area of Buševec, POWERPOOR for the area of the city of Križevci and EmpowerMed for the city of Zadar and Zadar County) will include the question of property ownership, i.e. whether the households live in their own property or in a rented one that is specific to the ENPOR project.

Consensual-based indicator (ability to keep home adequately warm/cold); arrears on utility bills; condition of the building; expenditure-based indicator; energy prices were collected as a set of indicators using the national survey developed by DOOR, which included data on energy poverty in the rental sector as well as a broader set of national data on energy poverty.

Since the description of the implementation progress in D3.2 at the end of 2021 6 additional REACT and 5 additional target group meetings have been held.

During the nine REACT and six target group meetings, the focus was on proposing new challenges and measures in the programs, which were identified through these meetings:

- The lack of a national definition and criteria for energy poverty is a significant problem.
- The unregulated market and unresolved property-legal relations contribute to the lack of national data for the private rental sector.
- It is crucial to implement financing measures within the framework of the program for the energy renovation of multi-apartment buildings to support landlords and tenants in order to combat energy poverty in the private rental sector.
- Special measures and criteria should be proposed as options to alleviate energy poverty in the private rental sector.
- There is a need for more systematic education of citizens about energy poverty and how to alleviate it in the private rental sector.
- The lack of funds is a concern, as many interested applicants are unsure if they want to invest

their money and time in applying for the next call. They are also uncertain about undertaking renovations without substantial financial assistance from the state.

- The majority of citizens are concerned about complicated administrative paperwork and registration processes.

- The challenge of co-ownership slows down the energy renovation process of multi-apartment buildings, and there is insufficient awareness among co-owners about the need for regular maintenance of the building systems.

- A division exists between apartment owners who reside in their apartments and prioritize renovations and apartment owners who rent their apartments and do not prioritize investing in energy efficiency since they do not live there and do not directly experience the issues of energy-inefficient buildings.

Furthermore, surveys have been proposed and conducted in various areas as mentioned in the first document, D3.2 “Working document on the implementation of the ENPOR policies”. The surveys include:

- An energy survey conducted in the Buševec area as part of the BušEko? project by DOOR and OSS Buševac, with 152 completed surveys. Detailed data on energy poverty in the Buševec area was obtained.

- An energy poverty survey conducted in the city of Križevci as part of the POWERPOOR project, with approximately 257 direct households visited.

- An energy poverty survey conducted in the city of Zadar and Zadar County as part of the EmpowerMed project, with approximately 200 direct households surveyed. Detailed data on energy poverty in the area was obtained.

- An energy poverty survey conducted in the city of Zagreb as part of the EPAH technical assistance for municipalities, with approximately 388 direct households surveyed.

These surveys covered a total population of 990,886 citizens, with direct household visits conducted for 997 households. The surveys collected information on property ownership, distinguishing between those living in their own properties and those residing in rented properties. Preliminary data were presented at the first and second ENPOR thematic seminars, and final data processing is expected to be completed in June 2023.

6.2.4 Role of the REACT group in the implementation

The REACT group and target group were established through various events such as meetings, information days, workshops, round tables, and more. The aim of involving all stakeholders was to ensure a more successful implementation period for the program 2021-2023 compared to the previous program 2014-2020. The expected improvements include:

- Increase in the number and frequency of opening public calls.
- Expansion of the types of programs offered.
- Diversification of the types of calls available.
- Increase in the allocated funds.
- Expansion of the number of households covered by the calls.
- Achieving primary energy savings (GWh/year) and a reduction in greenhouse gas emissions (tCO_2-eq/year).

6.2.5 Risks and challenges in the implementation of the policy/measure

- Non-existent cooperation between institutions. There is no data on the impact of energy programmes on vulnerable groups of citizens; no data on citizens at risk of energy poverty and participation of energy poor households in energy renovation; no statistics on extended families living in a joint household.

- Non-existent clearly elaborated definitions for citizens at risk of energy poverty or energy poor households.

- Existing programmes for energy renovation of energy poor households opened in 2020 included only citizens already targeted by the welfare system and excluded other categories of vulnerable groups of citizens and citizens at risk of energy poverty or energy poor citizens.

- Criteria and measures should be created taking into account the household/citizen income and expenses but also taking into account the energy consumption of the building.

- The administration for applying for an energy renovation is too complicated and centres/local offices/energy agencies should be established or existing state/local officials should be trained to help apply for support for energy poor citizens/households – and the administrative paperwork and application itself should be simplified.

- The energy renovation program for multi-apartment buildings for the period 2014-2020, as well as the extension through the new “Energy renovation program for multi-apartment buildings 2021-2027” should incorporate clear criteria for identifying energy poor citizens. It is crucial to include specific measures within the program to address the needs of energy poor citizens in the context of apartment building renovations. In the previous period of 2014-2020, energy poor citizens or households were only mentioned in the energy renovation program for single-family houses. The programs targeting energy poor households exclusively focused on single-family houses and did not include multi-apartment buildings. To ensure a more comprehensive and inclusive approach, it is important to bridge this gap and include energy poor citizens living in multi-apartment buildings within the scope of the program.

- Targeting the so-called free-based tenancy, which always includes two separate families/households in the same dwelling, is difficult. This subgroup has not been targeted yet and apartments for rent were mainly out of policy focus due to lack of national data.

6.2.6 Implementation results and lessons learned

The significant change between the programs implemented during the period 2014-2020 and the new programs for 2021-2030 is the recognition and inclusion of energy poverty as a pressing issue that needs to be addressed. The identification of energy poor households as a problem to be tackled is a crucial development. Additionally, the introduction of a dedicated program specifically targeting the renovation of energy poor buildings is a notable innovation compared to the previous programs.

One of the shortcomings of the previous programs was the lack of establishment of working groups involving all relevant stakeholders. Such groups could have contributed to a more comprehensive and well-designed program. However, it is still possible to influence the creation of public calls resulting from these programs, and efforts have been made by the Croatian REACT and target groups to enhance the co-design of these calls.

Another drawback is the delay in adopting the program for energy renovation of family houses. Although the program from the period 2014-2020 has been continuously extended, three calls have already been opened under that program. A positive step forward would be to make the process of program design more transparent and open to the public and relevant stakeholders. This would provide an opportunity for the proposed measures from the REACT and target groups to be incorporated into the program itself.

On a positive note, the research conducted through the ENPOR project, which gathered data on energy poverty in the private rented sector, will be utilized to develop a policy to be implemented by 2026. This policy will be related to the ETS system for private residential buildings, including both family houses and multi-apartment buildings. Furthermore, the cities where the research was conducted will receive individual reports with data on the private rented sector and energy poverty in their respective areas. The proposed measures will be linked to existing renovation programs. The cities and municipalities involved in the ENPOR policy co-design are the City of Zagreb, the City of Zadar, the City of Križevci, and the Municipality of Buševec.

During the implementation of the ENPOR project, a project proposal submitted under the LIFE call in 2022 was accepted. This project, in partnership with DOOR and the city of Gospić, aims to establish an office to assist energy poor households with energy renovations.

The focus in Croatia will be on buildings covered by the ENPOR policy outlined in the “Program for alleviation of energy poverty, which includes the use of renewable energy sources in residential buildings in assisted areas and areas of special state concern for the period 2021-2025” (Official Gazette, No. 143/2021). Gospić, being a city covered by this program, has a mix of private housing, private rented sector, and social housing within the mapped buildings identified for renovation.

The efforts made during the ENPOR project have made progress in acknowledging and addressing energy poverty in the private rented sector. The actions and steps taken throughout the project have laid the groundwork for ongoing efforts to alleviate energy poverty even after the conclusion of the ENPOR project.

7 IMPLEMENTATION OF ENPOR POLICIES AND MEASURES IN ITALY

7.1 National policy framework in relation to energy poverty, especially with regard to the private rental sector, and changes since the start of the project

Energy poverty is a complex issue that affects millions of people in Italy, with negative effects on individuals' quality of life and health. Having adequate heating, cooling, lighting, and energy for household appliances is considered essential to ensure a decent standard of living and safeguard citizens' well-being. In 2021, energy expenditure for Italian families increased significantly (by approximately 20 % compared to 2020), primarily due to a sharp rise in gas and electricity prices. By the end of 2021, the average final price paid by households for electricity had increased by 35 %, while for gas it had increased by 41%. This substantial increase in prices and expenses led to a total 0.5 % rise in energy poverty in Italy, as measured by the Integrated National Energy and Climate Plan (PNIEC) indicator. By the end of 2021, energy poverty affected 2.2 million families, approximately 125,000 more than in 2020. In percentage terms, this phenomenon impacted 8.5 % of Italian families, representing a growing percentage that reversed the reduction observed in 2020. According to the Italian Annual Report on Energy Efficiency 2022, households living in rented dwellings exhibited a high energy poverty indicator (14.5 %), surpassing both the national average and other disadvantaged categories. Conversely, homeowners were less exposed to the risk of energy poverty, with a rate of 5 % reported in 2020. However, the "free use" category displayed a higher percentage of energy-poor households (16.5 %). Detailed analysis is needed to identify specific characteristics of these families.

The main instrument to specifically combat energy poverty in Italy is currently the "social bonus", represented by a discount on electricity and gas bills. The electricity and gas social bonuses provide, in the form of a bill discount, an amount that varies as a function of the number of family members and, with respect only to the gas social bonus, also as a function of the climatic zone and the type of use.

Families wishing to access those social bonuses must have an income of less than €8,107.50 (as per their equivalent economic status indicator), increased to €20,000 for large families (with more than three dependent children). As well as these social bonuses, there is also an electricity bill discount available to people reliant on life-saving medical equipment (known as the ‘physical ailment social bonus’), which is granted irrespective of income. Those social bonuses collectively totalled €166 million in 2017. In 2018 the total amount granted for the electricity bonus was around €120 million, for the gas bonus around €64 million; between the launch of the mechanism and 31st December 2018, around 2.9 million families benefited at least once from the electricity bonus and around 1.8 million families benefitted from the gas bonus. In both cases, these values have ample room for growth: the ratio of families effectively subsidised to those who might still benefit from the bonuses is between 30 % and 35 %, according to ARERA. In order to broaden access to the measure, in the last 12 months, measures to coordinate the mechanism with other social policy measures have been introduced.

Specifically, within the meaning of Article 5(7) of Decree-Law No 4 of 20th January 2019 (transposed in amended form by Law No 26 of 28th March 2019), those who benefit from the 'citizenship income' (or citizenship pension) established by the same decree have automatic access to the social bonuses for electricity and gas.

Starting from July 1st, 2021, the disbursement of the bonus to offset electricity and gas expenses incurred by families in economic hardship has become "automatic". To receive the bonus, interested parties only need to present the Single Substitute Declaration to certify their income situation (ISEE). Once it is verified that the ISEE falls within the predetermined thresholds, the INPS sends the necessary information to the Integrated Information System managed by Acquirente Unico S.p.A. This system then contacts the electricity and gas suppliers of those who are entitled to the bonus.

The implementation of the automatic mechanism for disbursing the electricity and gas bonus simplifies the process of obtaining the benefit. Previously, since 2008, the benefit required the consumer to be proactive and personally submit an application for eligibility and renew it annually. As a result, until 2020, only one out of three potential beneficiaries actually received the benefit. This improvement marks a significant step forward in the fight against energy poverty by utilising existing databases and digital infrastructures.

Aside from the social bonuses, there are also two tax deductions, which respectively reduce the excise due for the first 150 kWh of electricity consumed per month by Italian families and the price of fuel used for heating in Sardinia and in mountainous areas/small islands.

Looking at more structured measures aimed at improving the energy efficiency of households, with positive impacts in the medium and long term, both in economic and environmental terms, there is a tax deduction for the energy refurbishment of buildings, known as "Ecobonus". This instrument has also been extended to independent social housing institutes thanks to the Budget Law for 2018.

Furthermore, in May 2020, the "Decreto Rilancio" (Decree-Law No 34/2020) introduced the "Superbonus 110 %" as a temporary measure to promote building renovation.

This measure is expected to be in effect until 2023. The Superbonus increases the deduction rate to 110 % for expenses incurred for specific interventions in energy efficiency, anti-seismic measures, installation of photovoltaic systems, or infrastructure for electric vehicle charging in buildings. It applies only to deep renovations, which require at least one "driving" measure (such as complete insulation, replacement of heating systems, or anti-seismic measures) and can be accompanied by "driven" measures (such as EV charging infrastructure, PV systems, etc.).

While the Ecobonus and Superbonus are not explicitly targeted at vulnerable groups or those experiencing energy poverty, measures have been introduced to allow consumers to transfer credits to construction companies or banks, making energy efficiency incentives more accessible, especially in the case of the Superbonus. However, it's important to note that this measure has been revised, and currently, credit transfer is granted only in specific cases.

7.2 Training and Information Campaign – IT

7.2.1 Description of the measure prior to the ENPOR co-creation process

A national programme for information and training was funded by the Italian Ministry of Economic Development that assigned a specific role to information and training as a fundamental driver to create, reinforce and develop the attention towards energy saving and energy efficiency. Article 13 of Legislative Decree 102/2014, indeed, envisaged a specific three-year training and information programme, the elaboration of which was realised by ENEA involving different actors such as regions, consumer associations, and associations of ESCOs and energy services companies.

The first year of activity was characterized by information and training activities focused on the public at large, by means of the national campaign “Italia in classe A”. The radio and television information campaign was organized in 2016 on the three main RAI television broadcast channels, identifying with ENEA’s support, several TV programmes well known by the public, covering the main television genres (news, soap opera, infotainment, quiz show, etc.) and the most of broadcasted time slots. The second phase was characterized by tailored targets while phase 3 was dedicated to monitoring and consolidation (third year) consisting of consolidation of initiatives, dissemination of results and analysis of the communication impacts, with evaluation and control of achieved results.

Targets of the campaign include enterprises, operators promoting energy efficiency such as energy managers, ESCOs and energy experts, PA personnel, students, families, multifamily buildings, consumers, financial institutions and “multiplier effect subjects” (i.e. non-technical individuals that transfer energy efficiency info and behaviours to close environments).

A new National Energy Efficiency Training and Information Programme is currently being carried out, according to Italian Legislative Decree 73/2020 art. 12 . It is intended to end in 2030 and it has a 9 million EUR budget every three years. ENEA, in cooperation with GSE, plans a targeted information and training program and, after taking into account stakeholders’ inputs, submits to the Ministry the plan for approval. The current edition was approved after an online public consultation in 2021. ENEA coordinates the Programme on behalf of the Ministry of Environment and Energy Security.

It is a multimodal programme including measures relating to education, training, information and awareness raising as well as behaviour change. The program also funds research activity on communication instruments and multidisciplinary approaches to individual attitudes to behaviour change. The new program is included in the National Recovery and Resilience Plan (Piano Nazionale di Ripresa e Resilienza, NRRP), part of the Next Generation EU (NGEU), under 1.1 Mission 2, Component 3.

7.2.2 Changes to the measure resulting from the co-creation with the national REACT group

The developed proposal from the REACT group aims to give more space and visibility to the issue of energy poverty in the national training and information programme on energy efficiency “Italia

in Classe A". The objectives of the adapted programme are to analyse the most appropriate communication modalities to reach energy poor households in the PRS, tailoring feasible information materials, and help them access information on fiscal incentives for energy renovation or alternatively help promote a change in behaviour and allow them to make more informed decisions on energy use and energy efficiency of their homes.

7.2.3 Description of the implementation process

When the first REACT group meeting was organized, the primary objective was to discuss and identify the components of the current fiscal incentives for energy efficiency in buildings, with a particular focus on the Superbonus 110 %, which is highly suitable for supporting energy poor tenants. The initial plan was to develop informational materials that would help these households better understand the incentives and how they could benefit from them. However, this plan had to be revised due to the continuously evolving regulatory framework implemented by the responsible authorities. The frequent changes in information and circumstances made it challenging to create reliable communication materials for vulnerable households.

As a result, the focus of the REACT group shifted, and the discussions centered around developing tailored communication materials specifically targeting energy poor households, as well as determining the most effective channels to reach them. It was agreed that the language used should be non-technical and easy to understand. Emphasizing the health benefits of the measures and behaviours adopted, as well as ensuring their safe implementation, was considered crucial. The group also acknowledged that building managers and tenants should be the primary audience for the communication materials, preferably in the form of brochures or leaflets. Building managers are familiar figures who are usually trusted by tenants and owners, making them an effective and neutral channel for disseminating information. The REACT group deemed that information from an unknown source would be less effective in comparison.

Given the significance of fiscal incentives in current energy efficiency interventions, it was recognized that owners of apartments accommodating energy poor tenants might also find them of interest.

Consequently, the brochures intended for building managers include relevant information about these incentives as well.

ENEA took the initiative to draft an initial version of the brochures and shared them with the REACT group, seeking their feedback. Based on their input, ENEA finalized the brochures. These materials will be disseminated through the REACT group members, who have the potential to become media partners, and during events and initiatives promoted by Italia in Classe A.

In order to simultaneously test certain materials and raise awareness among younger generations regarding energy efficiency and energy poverty, ENEA actively participated in a training initiative called White Energy Week. This initiative took place in a group of schools located in Emilia Romagna and reached approximately 750 students. The program was conducted twice, in both 2022 and 2023. Throughout these events, students were encouraged to adopt and promote energy-saving

tips within their own households and families, with the ultimate goal of fostering behavioural changes.

7.2.4 Role of the REACT group in the implementation

The REACT group played a crucial role in comprehending the information requirements of energy poor households, taking into account both the tenants' and landlords' perspectives. This understanding enabled the group to select the most suitable solutions and devise effective communication and engagement strategies. ENEA took the initiative to draft the communication material and shared the initial version with the REACT group. As the group comprised various stakeholders representing owners, tenants, consumers, and others, their feedback was invaluable in determining the necessary information to be included. The participation of building manager associations within the REACT group was particularly valuable, as their insights helped shape the material to effectively engage building managers as key channels for disseminating information on energy efficiency incentives and energy-saving tips to benefit energy poor tenants and involve dwelling owners. Additionally, the REACT group partners will be asked, on a volunteer basis, to support the communication material created for ENPOR by becoming media partners.

7.2.5 Risks and challenges in the implementation of the policy/measure

The housing market in Italy is characterized by significant fragmentation, with rented apartments in buildings owned by multiple proprietors. Consequently, reaching tenants becomes a significant challenge, as each tenant's situation can vary greatly. Moreover, it is worth noting that in Italy, some of the most vulnerable tenants may not have regular rental contracts.

To effectively reach and have an impact on energy poor tenants, it is crucial to establish trust before presenting them with energy advice. This is why ENPOR has focused on utilizing building managers as potential channels to engage with these tenants.

Another important factor to consider is that energy poor tenants are often already striving to save money, sometimes at the expense of paying attention to the health consequences of living in homes with leaks, dampness, and decay. Therefore, in ENPOR, we have made a deliberate decision to develop communication materials that provide information about behaviour-changing tips that can be adopted without incurring additional costs. These materials also highlight the health and safety benefits of implementing certain solutions, recognizing that improving in-home comfort can be a significant achievement.

In recent years, Italy has introduced significant fiscal incentives for energy efficiency renovations, such as the Superbonus 110 %.

However, the continuous updates to the regulatory framework and the resulting uncertainty have created obstacles for households at risk of energy poverty in pursuing these incentives. Additionally, the administrative procedures involved in accessing the fiscal incentives have complexities that may have discouraged those who lack the means or confidence to navigate the process to its completion.

7.2.6 Implementation results and lessons learned

In the national training and information program on energy efficiency, "Italia in Classe A," a significant focus will be given to addressing energy poverty. Specifically, a dedicated section related to energy poverty will be created on the program's new website, emphasizing "persons" and "behaviour change." This section will provide information about initiatives working on energy poverty at various levels, offer knowledge resources, and provide communication materials tailored to different target audiences. The aim is to increase awareness about energy poverty and provide tips on how to change behaviours to reduce energy expenses at home and improve indoor comfort levels. The Italia in Classe A portal will also feature updated information on financial opportunities available for energy efficiency interventions.

Two concise handbooks will be published and distributed through the REACT group and Italia in Classe A. The first handbook targets building managers and provides guidance on structuring communication campaigns within the buildings they manage. The objective is to incentivize owners to adopt renovation measures that enhance energy efficiency and reduce consumption. The second handbook offers a series of simple good practices and advice on improving energy usage at home, along with potential savings. Special attention is given to comfort and health-related aspects.

The project activities have shown that it has been extremely helpful to bring in the perspective of tenants and landlords through the REACT group and to use building managers as a channel to reach energy poor tenants. Continuously changing framework conditions are a major obstacle in the development of appropriate support measures and should therefore be avoided by the responsible authorities as far as possible in order to allow for planning and not to overburden households.

Regarding the awareness initiatives conducted with students, the results have shown their high interest in topics related to energy efficiency, including its connection to climate change.

They are keen to learn about behaviours that can be implemented in their homes to save energy, as this topic is not always extensively discussed. Many students are unaware of the concept of energy poverty and whether they fall into this category. Recognizing the influence teenagers can have on their families and their eagerness to learn more about energy efficiency, they represent an important target group for future communication efforts on energy poverty. This aspect will be taken into consideration when planning future initiatives within Italia in Classe A.

8 IMPLEMENTATION OF ENPOR POLICIES AND MEASURES IN THE NETHERLANDS

8.1 National policy framework in relation to energy poverty, especially with regard to the private rental sector, and changes since the start of the project

In the Energy Agreement formulated by the Dutch parliament in 2013[15], ambitious goals have been set for energy saving in the built environment (e.g., all homes, offices, schools and other buildings). A key focal point of the Dutch energy transition is the switch from natural gas to sustainable sources of energy. Furthermore, the aim of the Energy Agreement is for the built environment to become more sustainable over the next 30 years, through improving energy efficiency and increasing the use of renewable energy. The sustainable energy transition focuses on the built environment, because sustainable modifications within the built environment such as improved insulation can contribute substantially to the reduction of national CO_2 emissions. Initially, the national energy efficiency policy was mainly aimed at improving the energy efficiency of buildings, installations, and appliances. Energy saving by influencing behaviour received little policy attention, even though energy consumption partly depends on the living habits and preferences of residents[16]. This makes the energy transition also a social transition since it affects the homes and living environment.

Energy poverty has slowly been put on the political agenda, and the vulnerability of those experiencing energy poverty was often neglected by policymakers. In 2021 it was still mentioned that "Energy poverty is only an emerging agenda in the Netherlands, principally driven by local authorities' recognition of the value of addressing environmental, health, social welfare and poverty goals through measures to address the problem and European Union (EU) requirements for reporting on energy poverty as part of the Energy Transition. There is, as yet, no national policy, and the national government has been reluctant to articulate energy poverty as distinct from poverty in general"[17]. Energy poverty is mostly addressed via the general poverty care system and primary measures are aimed at disconnection prevention. This is complicated because poverty care measures are generally taken at the municipal level, however, all major decision-making and resource allocation for decarbonization and the energy transition currently stem from national law and policy.

Even though no nationwide policy on energy poverty reduction is adopted, the Dutch government has taken several measures to reduce energy poverty in the last few years. Since energy prices rose after the COVID-19 crisis in 2021, but went through the roof after Russia's invasion of Ukraine in 2022, energy poverty became a much more urgent matter for European countries, including the Netherlands. The overview below, stemming from the TNO 2023 study on the scientific and policy state of play on energy poverty, gives an overview of measures being taken in the Netherlands since 2021 aiming at reducing energy bills:

[15] https://www.rijksoverheid.nl/documenten/convenanten/2013/09/06/energieakkoord-voor-duurzame-groei
[16] Straver et al., 2017, Rapportage Energiearmoede. https://publicaties.ecn.nl/PdfFetch.aspx?nr=ECN-E--17-002
[17] Feenstra et al., 2021. Humanizing the energy transition. https://eprints.whiterose.ac.uk/174822/

Netherlands	• Total of €300 million for municipalities to support energy poor households (first €150 million was announced in 2021). – Energy poor households as defined in TNO study with Low Income High Costs and Low Income Low Energy Efficiency Home (Mulder et al., 2021a) • Lowering of the energy tax on electricity • Energy tax refund increased from €560 to €785. • Increase of the energy surcharge to €1300 for welfare recipients and people earning less than 120% of the social minimum (earlier measures announced an increase of €200 and €800). This increase is also disbursed in 2023. • Lowering of the energy VAT from 21% to 9% (natural gas, electricity and city heating). • 10% increase of the minimage wage. • Price cap starting in January 2023: 40 cent/KWh and €1.45 m^3 gas, for a use below 2900 kilowatts hours and 1200 m^3 gas. Households using more electricity and/or gas pay the higher electricity price. • All households receive €190 in November and December to bridge the months before the price will be active.

Figure 10: Measures adopted by the Netherlands to help alleviate adverse consequences of rising energy prices[18]

At the governmental level awareness has grown of the necessity to specifically address vulnerable groups in society when it comes to alleviating energy poverty. However, the overview shows that many of the measures that have been taken target households in general. As TNO mentions, they "observe two trade-offs in this regard: 1) reaching many households fast versus reaching households most in need of help slower, and 2) helping households on the short-term with their purchasing power versus helping households become resilient in the medium to long-term."[19] As a result, certain vulnerable groups might even be excluded from certain measures, such as students living in student houses. For example, they could not apply for the 190 euro cashback, because they do not have a single energy contract. Organizations such as the National Student Union (LSVb) have been calling for a national solution for months. In multiple cities, students have gone to court in order to force their municipality to include their applications, with success.

Next to these financial incentives to reduce energy bills, other programmes and initiatives have been taken to combat the other, underlying problem that leads to energy poverty: the poor state of housing stock. In 2021, the government has made available a sum of €150 million to

[18] TNO (2023), Energy Poverty: A Science and Policy State of Play, pg. 32 https://publications.tno.nl/publication/34640524/86Phvt/TNO-2023-P10119.pdf

[19] TNO (2023), Energy Poverty: A Science and Policy State of Play, pg. 29 https://publications.tno.nl/publication/34640524/86Phvt/TNO-2023-P10119.pdf

municipalities in order to combat poverty[20]. Municipalities are to a large extent made responsible to encourage individual homeowners, housing corporations and landlords to take measures to improve their homes. This is being done by national information campaigns[21], which focus on small energy-saving measures. Municipalities were requested to use these funds in order to provide energy-saving advice or measures to their constituency. Municipalities were allowed to choose the way to spend this money themselves. It concerns, for example, the adjustment of the central heating system, the application of radiator foil and draft strips or the installation of LED lamps. These schemes are the ones being used to finance for example the Energybox that is the focal point for ENPOR in the Netherlands. This RREW is in place since 2020 and its budget has already been raised. The scheme ends in December 2023.

When it comes to larger-scale measures such as insulation, this is still mainly considered to be a matter for landlords to address[22]. The social housing organisations' so-called National Performance Agreements have been signed in 2022, with clear goals to improve housing quality. For example, it is agreed that as of 2026 no houses will be on the market with low maintenance quality and that corporations will invest € 200 million extra per year until 2030 in the improvement of their housing stock[23].

In the private rental sector, no such agreements have been made. It has also been decided that as of 2030 landlords may no longer rent out poorly insulated houses with labels F and G. To promote landlords taking energy saving measures, the main focus lies on providing extra subsidies. For example, the government has made a sum of €124 million available for subsidies for homeowners and landlords to be used for measures such as isolation, heat pumps and more[24]. Furthermore, in 2023 the National Insulation Programme was launched, aiming at the worst insulated homes. It has to be mentioned that one of the main issues with these types of policies is that it is still hard to reach the energy poor since policymakers are, because of privacy laws, not able to use income data to grant subsidies to households.

Finally, as requested by the national government, the research institute TNO is monitoring the development of energy poverty in the Netherlands. In its latest report[25], it has drawn up an up-to-date estimate of the level of energy poverty at the end of 2022 at both national and local levels.

The TNO report shows that, as a result of high energy prices, the share of energy poor households is estimated to have risen from 6.4 % to 7.4 % between 2020 and 2022. The total number of households that will suffer from energy poverty in 2022 is estimated at 602,000 (7.4 % of the total number of households). This TNO report is part of the long-term TNO knowledge program on

[20] https://www.rijksoverheid.nl/actueel/nieuws/2021/10/15/150-miljoen-euro-voor-aanpak-energiearmoede-kwetsbare-huishoudens
[21] https://netherlandsnewslive.com/expansion-of-budget-due-to-popularity-of-insulation-measures/124819/
[22] https://www.rijksoverheid.nl/onderwerpen/energie-thuis/vraag-en-antwoord/hoe-kan-ik-energie-besparen-in-mijn-huurwoning
[23] Nationale Prestatieafspraken | Aedes
[24] https://www.rvo.nl/subsidie-en-financieringswijzer/isde
[25] Energiearmoede in Nederland 2022 | Rapport | Rijksoverheid.nl

energy poverty, in cooperation with the national government.

8.2 The Energybox – NL

8.2.1 Description of the measure prior to the ENPOR co-creation process

The Energybox was established in 2014 by de Jonge Milieu Adviesbureau (JMA), the municipality of Utrecht, the tenant organisation ”De Bundeling” and the social housing associations Mitros, Bo-Ex, SSH, Groenwest and Portaal. The Energybox project is a social enterprise raised with a triple purpose: first to reduce the energy consumption of residents, second to fight (energy) poverty and third to provide jobs for the (long-term) unemployed. The Energybox consists of a consultation with an energy coach, an advisory report, and a box with energy-saving products. During the consultation, an energy coach explains how to use the energy-saving products and discusses the residents’ energy consumption.

Figure 11: Handing over an Energybox by an energy coach to a resident (by Rob Lamping - JMA)

Based on the consultation, the energy coach provides the residents with energy-saving advice in a report tailored to the resident's situation. The advice can be implemented by the residents without big investments or costs, making it possible for the residents to save money on their energy bill and increase their living comfort without renovations or investments.
Residents receive a box with energy-saving products aimed at improving energy-conscious behaviour at home. Initially, the Energybox measure of JMA consisted of a standard procedure as follows:

Figure 12: Procedure of the Dutch Energybox

The results of the Energybox speak for themselves: in 2021, 19,000 residents were reached and in April 2023 this number has grown to almost 45,000 residents. Until now more than 5 million Euros are saved per year by households through the use of the Energybox. The average savings per household after a visit of a coach is about 257 kWh of electricity and 100 natural gas m^3 each year. The results are continuously updated and can be found on the website at https://energiebox.org.

All Dutch municipalities have been given the opportunity to register with the national government for the Energy Use Reduction Scheme (RREW). This scheme helped in financing the Energybox approach in several municipalities.

8.2.2 Changes to the measure resulting from the co-creation with the national REACT groups

From the first REACT group meeting it was perceived that the biggest challenge for the trajectory of the Energybox was to reach tenants and specifically private tenants. There was a clear need to increase the response rate. Therefore we decided to focus on the promotion trajectory of the Energybox and how this could be improved.

With the focus on ENPOR on energy poverty and the increasing attention energy poverty got in local and national policy, together with rising energy prices in the Netherlands since 2021, more attention has gone to reaching the energy poor with the Energybox.

In later REACT group meetings, it became clear that not only could the response rate be improved, but JMA also had to look at the specific approach and measures to reach target groups with a risk of energy poverty, such as people with a migrant background and students. In brief, the issues that were addressed in the REACT groups can be described as:

- Energy poor households, specifically certain target groups such as people with a migrant background, were less reached;
- Private tenants were less reached;
- The procedure and measures in the box did not always fit the target groups;
- And the energy measures and advice did not always lead to lasting energy savings and changed behaviour.

Together with the representatives of relevant stakeholders that took part in the REACT group, the full Energybox procedure was examined to look for possible improvements. This led to a list of adjustments to the initial procedure, which have all been tested and implemented in several ways in vaarious Dutch cities. An overview with a short description has been given below. In the next

section, these will be discussed more in detail, along with their implementation process.

Tool for neighbourhood analysis

A tool for a quick and easy analysis of a targeted neighbourhood to improve the promotion trajectory. This analysis consists of several relevant technical, social, and area-dependent indicators that help to provide insight into the expected level of energy poverty in the neighbourhood.

Energybox with choice in measures

A measure with the aim to provide more flexibility and choice upfront for the tenant. This also includes the option for the energy coach to provide extra materials (e.g. more radiator foil) and products during a visit, in order to respond to the needs of the tenant.

Energybox with an extra visit

In this approach, an extra visit of the energy coach to the household is planned after 8 weeks. The goal is to support the tenant in maintaining new behavior and to assist – if necessary – with the implementation of certain measures.

Energybox with practical help

In this case the energy coach will not only give advice, but actually install the energy-saving products in the home if the tenant needs help.

Energybox in case of language barriers

In order to reach more tenants with a migrant background, invitation materials were translated into English and other languages.

Energybox via the social network

The Energybox was promoted not only using paper or email invitations, but making use of existing social networks and events organized by local social organizations, such as distributing food at the food bank and women's evenings of St. Al Amal.

In another experiment, a cargo bike of Energybox visited the parking lot of targeted flats. Together with door-to-door visits of energy coaches and posters, this resulted in a multi-layered promotion approach. It was not possible due to COVID to do this experiment at flats of institutional investors. This experiment was carried out by JMA together with the housing association Mitros.

Energybox focussed on students

In order to reach more students in (private) student housing, door-to-door visits by energy coaches and at-the-door short advice was implemented. Also, the materials in the box were adjusted to the needs of students.

Energyvoucher

In the municipality of Zeist residents received a voucher worth €75, which they could spend themselves at local DIY stores. This approach was monitored to compare to the Energybox approach.

8.2.3 Description of the implementation process and the role of the REACT group in the implementation

In general, the REACT group was used to monitor the implementation and to gain feedback. According to the change in the measure and the target group, we adjusted the composition of the REACT group. In the REACT group, the results of pilots were shared and discussed. Stakeholders were asked to reflect on the Energybox approach and the communication strategies used. Their feedback was used in the development of the diverse measures.

Tool for neighbourhood analysis

One of the conclusions from the first REACT group meetings (first and second meeting) was that municipalities and organizations are experiencing difficulties in locating tenants experiencing energy poverty. In this regard, we tried to develop a qualitative tool to help JMA and municipalities to make a quick and easy analysis of a targeted neighbourhood in order to improve the promotion trajectory. This analysis consists of several relevant technical, social, and area-dependent indicators that help to provide insight into the expected level of energy poverty in the neighbourhood.

The tool was meant to help organizations choose the neighbourhood which is most likely to accommodate private tenants experiencing energy poverty for their campaigns (such as that of Energybox). All the indicators used are backed up by literature research and make use of open-access data.

We also analysed in literature the different promotion and communication strategies that JMA has been using in the past for the Energybox. This desk research has been supplemented with communication tools and ideas derived from the REACT group meetings (nr. 2 + 3) and has resulted in an extensive overview of all different options for promotion. An insight was that they had a wider variety of materials available than initially shared.

A prototype of the tool for neighbourhood analysis was validated in a pilot project with one private housing corporation in Utrecht. It was used to analyse the different neighbourhoods as provided by the private housing corporation.

Based on this analysis one neighbourhood with three identical flats, each containing 72 apartments, has been chosen for an experiment.

We applied 3 different promotion strategies in 3 similar flats and analysed response rates in the private rented sector. Insights were that different approaches result in different response rates (range 5,6 % - 28 %). As part of the pilot we monitored the response rate as well as a few

consultations of the Energy coaches with the tenants. Based on the results of the pilot and the feedback received, we adjusted the tool into a final product. Unfortunately, it turned out that the tool was too time intensive for JMA to use in practice.

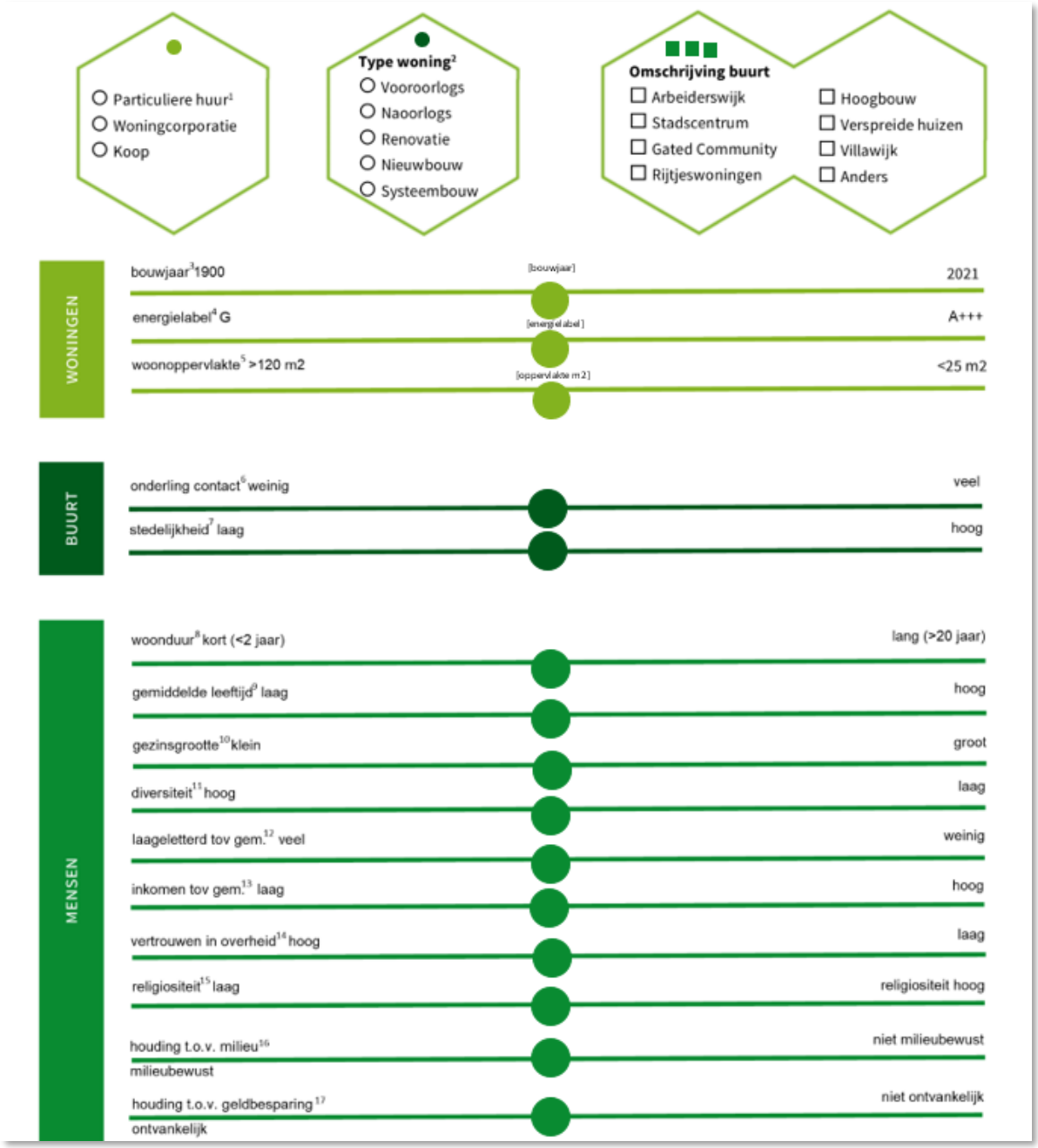


Figure 13: Impression of the first prototype of the new tool for identifying energy poor neighbourhoods

Energybox with choice in measures

Through several REACT group meetings and target group interviews we've learned that target groups have different needs and wishes regarding the products in the box.

A first step in differentiating the content of the box was implemented in the municipalities of Tilburg and Utrecht from 2020-2022. People could choose from different boxes. Upon registration on the website, it is possible to choose from two or more boxes with different measures. People can choose the box that best suits their needs.

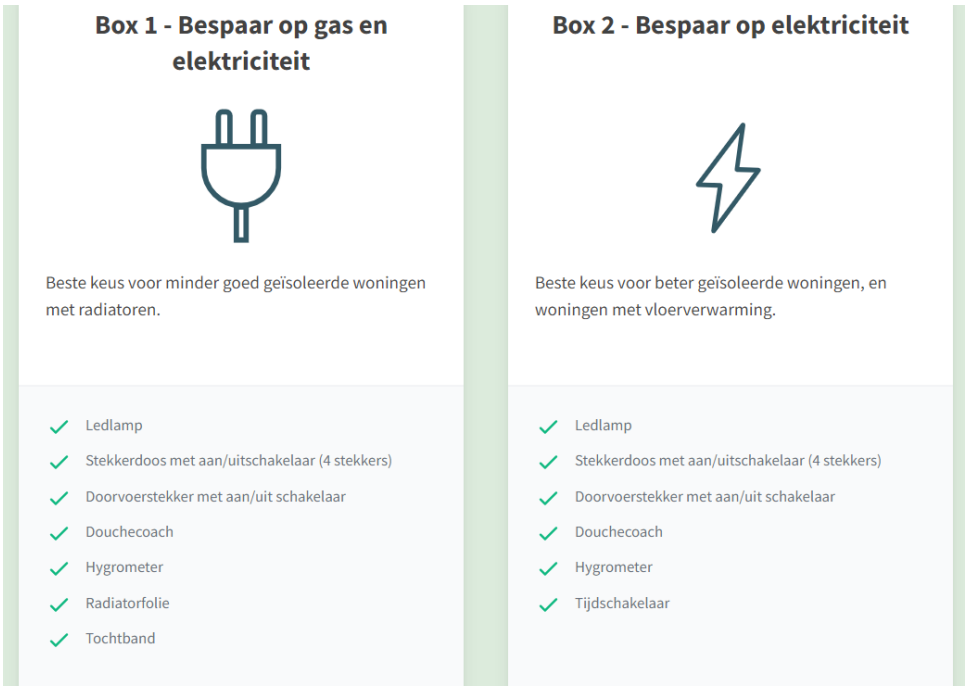


Figure 14: Choice of Energyboxes in the municipality of Utrecht in 2023 (https://energiebox.org/utrecht)

Energybox with an extra revisit

During national meeting 1 (and later on national meetings 2 and 3) and the REACT group we have learned that it is important to build a trustworthy relationship and to repeat a message to perpetuate behavioural change. The energy coaches in Ede received a presentation from one of the ENPOR researchers in order to prepare them for the second visits. Jointly it was concluded that the second visits should contribute to:

- Assist tenants in permanently lowering their energy bill;
- Making sure that advice and tips stick by the power of repetition;
- And to keep tenants aware and active in changing their behaviour.

Additionally, to get more insight into the experiences of the first visit, possible obstacles tenants might be experiencing in order to change their behaviour or implement measures and to receive

feedback on the Energybox or energy coach.

Together with JMA, we developed an improved checklist that is now being used by the energy coaches during the extra visit, see below.

Checklist vervolggesprek

Datum en tijdstip adviesgesprek: ....

ENERGIEBOX

Energiecoach: .....

Algemene gegevens

Naam: .....

Adres: .....

Vraag of ze het adviesrapport voor zich kunnen hebben. Zorg dat jij het ook voor je hebt op papier of online.

Boodschap is dat wij vooral willen helpen om de energierekening structureel naar beneden te brengen.

Onze doelen:

- Helpen om de energierekening structureel naar beneden te krijgen.
- Zorgen dat de tips blijven hangen door de kracht van herhaling (repetition is the mother of skills).
- De mensen in beweging te houden of te krijgen.

Verder kun je nog de volgende informatie verzamelen tijdens het gesprek:
1. Erachter komen wat ze vonden van de tips en het adviesrapport.
2. Nagaan wat ze hebben gedaan of nog gaan doen en waarom wel / niet.
3. Feedback over jou of verbeteringen voor ons verzamelen.

Figure 15: First part of the checklist for an extra visit used by energy coaches in Ede

An extra visit in the approach was implemented in the municipalities of Tilburg (2021) and Ede (2022). Positive experiences in Tilburg led to the adoption of follow-up visits in the city of Ede.

Energybox with practical help

During national meeting 1 (and later during national meetings 2 and 3) and the REACT group we've learned that some residents feel the need to have the measures applied. The products otherwise stay in the box. This approach was implemented in the municipality of Ede. It is an optional possibility.

Figure 16: Installing radiator foil in a resident's home (by Nanna van Hout - JMA)

Energybox in case of language barriers

Several civil society organizations took part in REACT groups (nr. 4 + 6). These REACT groups focussed on how to finetune the Energybox approach to people with a migrant background and vulnerable target groups (eg. low literate people). Language barriers were addressed here.

Multilangual promotion

It was found in an analysis of response rates that the response increased if recruitment was in English in neighborhoods with a high percentage of residents with a migration background in the city of Utrecht, such as Leidsche Rijn and Transwijk, compared to neighborhoods with a lower percentage.

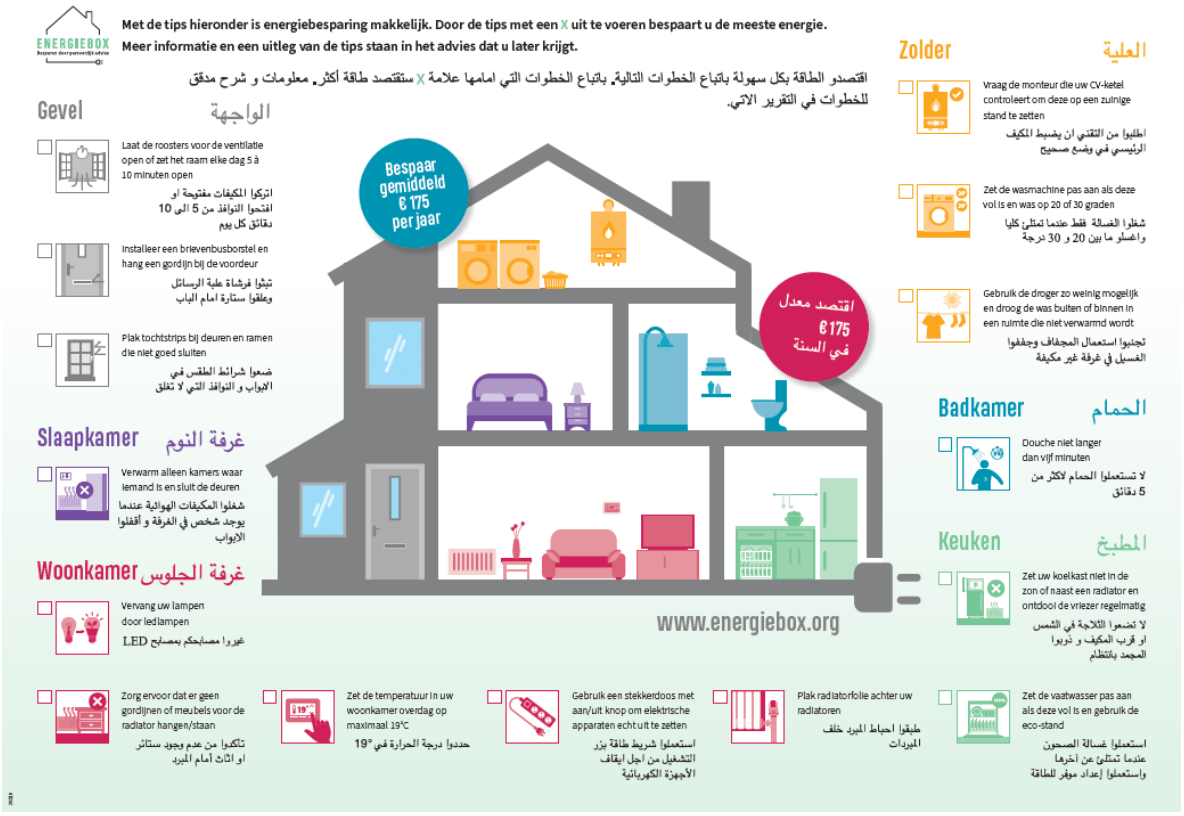


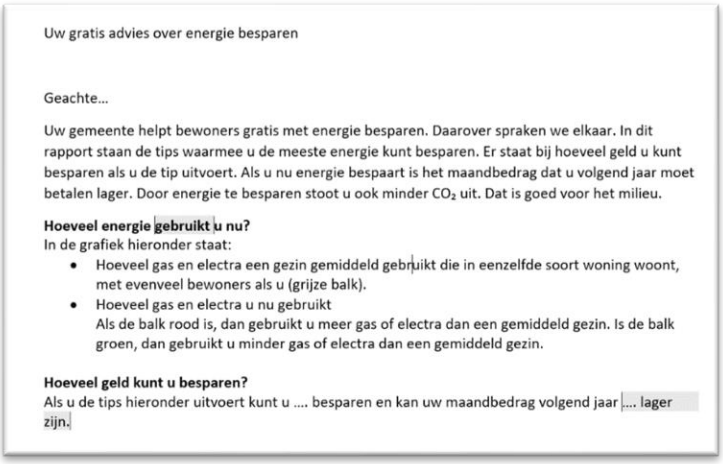
Figure 17: Example of a visual prompting board for the Energybox in multiple languages

A translation into Polish and Tigrinya for the multilingual prompting board above will probably follow. In the REACT group, it became also clear that it is necessary to recruit some multilingual energy coaches. So that also the conversation and advice can be done in other languages.

Figure 18: Energy coach recruitment flyer in Turkish

Vizualisation and simplified advisory report

The advisory report contained a lot of text. The text was rewritten in B1 language level text. Language level B1 stands for simple Dutch. The vast majority of the population understands texts at language level B1. Below a draft version of the simplified advisory report can be seen.



Uw gratis advies over energie besparen

Geachte...

Uw gemeente helpt bewoners gratis met energie besparen. Daarover spraken we elkaar. In dit rapport staan de tips waarmee u de meeste energie kunt besparen. Er staat bij hoeveel geld u kunt besparen als u de tip uitvoert. Als u nu energie bespaart is het maandbedrag dat u volgend jaar moet betalen lager. Door energie te besparen stoot u ook minder CO_2 uit. Dat is goed voor het milieu.

Hoeveel energie gebruikt u nu?
In de grafiek hieronder staat:

- Hoeveel gas en electra een gezin gemiddeld gebruikt die in eenzelfde soort woning woont, met evenveel bewoners als u (grijze balk).
- Hoeveel gas en electra u nu gebruikt
  Als de balk rood is, dan gebruikt u meer gas of electra dan een gemiddeld gezin. Is de balk groen, dan gebruikt u minder gas of electra dan een gemiddeld gezin.

Hoeveel geld kunt u besparen?
Als u de tips hieronder uitvoert kunt u .... besparen en kan uw maandbedrag volgend jaar .... lager zijn.

Figure 19: Example of approved text in advisory report in B1 language level

The text has been approved. At the moment a designer links up the advisory report with the visual prompting board. The icons of the visual prompting board will be used. A translation into Arabic and Turkish may follow.

Energybox with promotion via the social network

The REACT group meetings (nr. 4 + 6) also made clear the importance of cooperating with civil society organizations and their networks in order to reach people with a migrant background and vulnerable target groups.

This resulted in:

- A list of ideas for a better communication strategy to reach these people. One of the ideas was to reach more people by organizing or joining events.

- JMA recognized that these target groups require a different approach. JMA expressed their intention to collaborate closely with social partners, because trust is a very important factor.

In the municipality of Utrecht JMA has experimented with several alternative ways to make use of existing social networks and events organized by local social organisations. Two examples are distributing food at the food bank and attending women's evenings at St. Al Amal.

In this promotion trajectory Energybox worked together with the housing association Mitros.

A cargo bike visited the parking plot of targeted flats. Together with door-to-door visits of energy coaches and posters, this resulted in a multi-layered promotion approach.

Figure 20: Recruitment campaign in Lunetten (by Emiel Elgersma)

In the literature, we also found that students are a special target group that has problems with energy poverty in the private rental sector and JMA experienced that they had difficulties to reach them. We organized a REACT group meeting (nr. 7) focussing on approaching students affected by energy poverty. Students took part in this REACT group themselves as well as student organizations such as the National Student Union.

From this REACT group meeting it was concluded that in order to reach students, a separate approach should be designed, both in recruitment (e.g. through associations) and in advice, the way in which advice is given (equal to all residents), products (door closer, motion sensor) and unburdening when applying the measurements. It was also mentioned that the relationship with the landlord is of great importance and sometimes inhibits the realization of energy-saving behaviour.

Energyvoucher

In the meetings with the REACT group and relevant target groups, such as intermediaries and energy poor persons, another approach was the subject of our research. In the municipality of Zeist residents received a voucher worth €75, which they could spend themselves at local DIY stores[26].

1,777 invitations to tenants in the private sector were sent out. This approach was monitored to compare it to the Energybox. The survey resulted in an article (not yet published).

In general, the energy voucher campaign was evaluated positively. The private investors were happy with the in-depth research that was done to evaluate the project. However, from the data it seems that those tenants most at risk of energy poverty were not the ones most reached and were also not the ones most content with the energy voucher. This leaves space for improving the offer to vulnerable target groups in the municipality.

The survey (N=321) revealed high levels of satisfaction with the different dimensions of the program, apart from some occasional negative remarks relating to practical issues. It was also found that the Energy Voucher can be considered to recoup the initial investment made, as participants save between €115 to €200 over 5 years (at price levels of June 2021) through purchasing energy-saving products with the Energy Voucher. The fact that 35,9 % of respondents were willing to add personal funds for purchasing additional energy-saving products – averaging €35,55 – suggests that the total amount of energy and money saved may be even higher. However, some doubt must be placed on whether the municipal-style Energy Voucher program has been able to truly reach (all of) the energy poor, as the average monthly energy bill of our sample lay far below the national average. The Energy Voucher may not have managed to reach those citizens of Zeist experiencing energy poverty as a result of high monthly energy costs, but merely those with a lower average income (the "general poor' rather than the 'energy poor'). Our study also revealed that respondents' initial motivation for applying for the Energy Voucher program did not always match with what they would eventually argue had been its greatest effect. Finally, the raised possibility that those at the highest risk of energy poverty also rated the program the lowest

[26] Mijn Groene Huis: https://www.mijngroenehuis.nu/besparen-2/cadeaubon-voor-energiebesparende-artikelen/

warrants additional investigation. Further research is also required as to examine the experiences with the program by those in the private rental sector, as well as to establish the extent towards which participants can be considered energy poor on a more objective level, and to establish the effects of participation in the Energy Voucher program in the long run.[27]

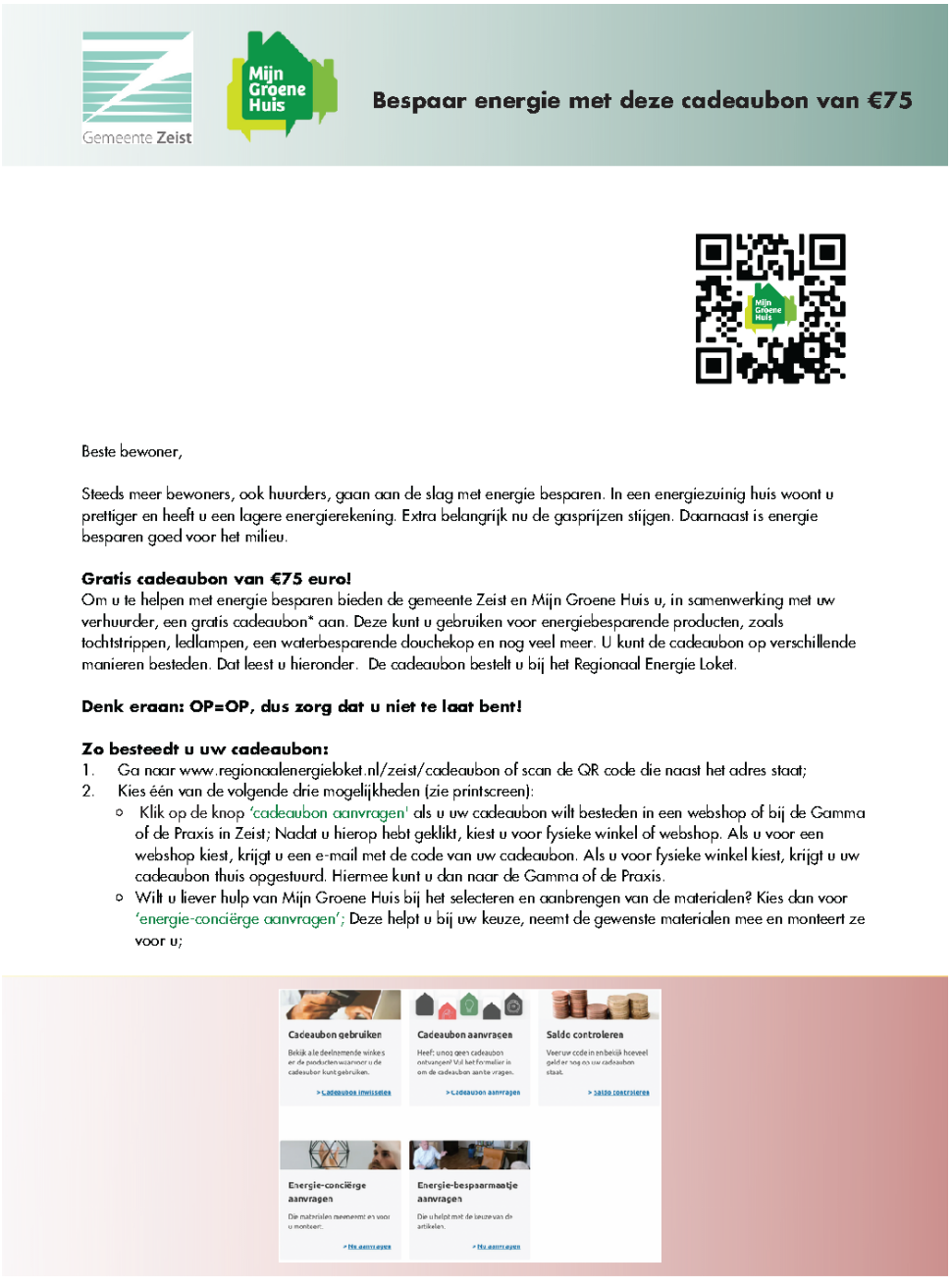


Figure 21: Invitation letter for Energy Voucher in Zeist

[27] Willems, T. Rietbergen, M., Vrielink. N. (2022): Evaluating the Energy Voucher: An experience analysis of a local Dutch initiative to alleviate energy poverty (not yet published article)

8.2.4 Risks and challenges in the implementation of the policy/measure

- JMA depends on funding from municipalities, so they cannot independently determine the approach. They also depend on the capriciousness of local policy.
- More customization and recruitment methods door-to-door and through other organizations is generally more labour-intensive and therefore more expensive.
- Social organizations do not always see energy saving as their interest and are busy with their primary tasks, and therefore do not always want to invest in cooperation.

8.2.5 Implementation results and lessons learned

Continuation of measures

Some of the measures will be continued after the project. JMA will continue the implementation of these measures. Due to ENPOR the options they offer to municipalities are now more diverse. The approach can be more customized to the energy poor and tenants compared to before the project started. In the end, it is up to the municipalities if they want such an approach.

Due to problems experienced from energy poverty, as well as rising energy costs and the accelerated energy transition, it has become apparent that municipalities and partners also want to offer advice on and provide **bigger energy saving measures**. Advice on comprehensive measures to save energy will be given this year to inhabitants first in the municipality of Eindhoven. Some examples are advice on isolating roofs, floors, or double glazing. In line with this a new offer is being developed, called 'My sustainable home'.

After always having focused on the energy transition and energy saving, a new focal point is creating climate-resistant homes with the Climatebox. A pilot for the implementation of the Climatebox is already underway in Eindhoven, while developments are also happening in Utrecht.

New stakeholders

Thanks to the project and REACT group meetings new stakeholders are now involved in addressing energy poverty, especially the social domain and civil society organizations. Some of the members of the REACT groups became partners to help tenants to save energy costs. Initially, Energybox started from the more technical perspective of saving energy.

Contribution to policy development

The municipalities Utrecht, Tilburg and Ede prolonged their Energybox projects together with JMA.

An Energybox project is currently running in the municipalities of Albrandswaard, Amersfoort, Barendrecht, Barneveld, Ede, Eindhoven, Lansingerland, Nieuwegein, Nissewaard, Ridderkerk, Son en Breugel, Stichtse Vecht, Tilburg, Utrecht, and Waalre (d.d. May 2023). In Utrecht, the

municipality developed policy measures directed at energy poor citizens. In Zeist, the municipality aims for a more customized approach in which informal networks and working together with social partners are important.

Discussions have taken place between the municipality of Utrecht and private rental housing corporations for a new pilot program to renovate old housing complexes. The program consists of citizen participation to inquire about existing energy saving measures and costs. If found necessary, a proposition will be made to renovate complexes, and if housing corporations refuse to cooperate, they will be taken to court.

Energybox has gotten more brand awareness over the years, and recently it has engaged in a collaboration with the Ministry of Social Affairs and Employment. The Minister of Public Housing and Spatial Planning even visited Energybox Tilburg. The ministry and Energybox will exchange expertise on and discuss the creation of inclusive employment opportunities in the energy transition, and how Energybox has approached this. The social aspect of Energybox is on the national agenda.

Households benefitted

The number of households that were able to benefit from the measures implemented during the project has grown. The results of the Energybox in 2021 amounted to 19,000 residents reached, and in April 2023 this number had grown to almost 45,000 residents. Until now, more than 5 million Euros have been saved per year by households through the use of the Energybox. The average savings per household after a visit of a coach is about 257 kWh electricity and 100 natural gas m^3 each year. The effect of the measures are described in further detail below.

Energybox with choice in measures

This approach reached approximately 2,200 tenants and led to increased average energy savings of about 60 kWh and 35 m^3 a year per household.[28] This positive response has led to a permanent adoption of the procedures of the Energybox. Per municipality and with every housing organisations or private investors, JMA now makes separate arrangements on the content of the box and the measures that tenants can choose from.

Energybox with an extra visit

The approach from March 2021 until March 2023 reached about 582 private and social tenants in Tilburg and has led to increased savings of an extra 34 % in relation to the first visit.[29] The positive response has led to a permanent adoption of the procedures of the Energybox. Per municipality and with every housing organisation or private investor, JMA now makes seperate arrangements about optional extra visits.

[28] J. Tielbeke – JMA, personal communications, May 10 2023
[29] J. Tielbeke – JMA, personal communications, May 10 2023

Energybox with practical help

No information about how many people asked for this practical help is available. Positive response has led to a permanent adoption of the Energybox procedures. Per municipality and with every housing organisation or private investor, JMA now makes seperate arrangements about optional practical help.

Energybox with multilangual promotion

With the multilingual approach, the response rates rose in the pilot. In the pilot areas sometimes even to 28 %. The average is normally 10-15 %.[30] No information about increased energy savings from this group is available, because country of origin is not one of the parameters monitored. JMA changed its approach more into a multilingual approach since then. The existing promotion materials were redesigned and adjusted based on the feedback. Eg. invitation materials were translated into English and Arabic. This is now part of their tailor-made approach depending on the targeted neighbourhood.

Energybox with promotion via the social network

With promotional activities carried out at the food bank and St. Al Amal, 3 up to 40 extra tenants were reached at each event. No information about the energy savings from this group is available.

The multi-layered cargo bike approach was very successful – the response rates went up from an average of 10 % to sometimes 50 % – but it is very labour-intensive (and thus expensive). No information about the specific energy savings from this group is available.

Due to its high labor requirements and subsequent cost, the approach is expected to have limited utilization in the future. A follow-up project together with a food bank is currently in the planning stage. The aim is to develop a less labour-intensive approach.

Energybox focussed on students

JMA has implemented these outcomes by experimenting with door-to-door visits by energy coaches. Not only did the coaches recruit at the door, but they would also give short advice. JMA is considering including different products in the Energybox. Several specific actions were focussed on students, but no figures are available about savings. The scale of these experiments was too small to make statements.

Energy Voucher

With this approach, the municipality of Zeist reached 3,500 tenants.[31] Participants save between

[30] J. Tielbeke – JMA, personal communications, May 10 2023
[31] Mijn Groene Huis: https://www.mijngroenehuis.nu/besparen-2/cadeaubon-voor-energiebesparende-artikelen/

€115 to €200 over 5 years (at price levels of June 2021).[32] The municipality has informed the investors of follow-up plans for a pilot to reach the most vulnerable tenants with a more personal 1-on-1 approach.

Lessons learned

It is necessary to better identify where private tenants live and what the energetic condition of their houses is. A customized approach is necessary to reach energy poor private tenants. Feasible options include adopting approaches specifically tailored to target groups like students, tenants on block heating, and private landlords when it comes to customization.

The approach must be simple and it is wise to promote an action in various ways. The "via-via" method is important in reaching vulnerable target groups that need help the most. Investing in the informal network and entering into and maintaining long-term relationships with it is crucial in this respect. Trust is the keyword. And cooperation with people and institutions that already have earned the confidence of households with energy poverty works best.

It is important for energy coaches to recognize that people with energy poverty can have a different living environment. What they have to take into account is chronic stress and therefore a more limited mental space and distrust towards authorities. In order to reach and retain financially vulnerable residents, you must adopt an equal and vulnerable position as a discussion partner. Stress-sensitive work is an interesting way of working for this. Energy coaches must be trained in this. Collaboration between energy coaches and representatives from the social domain with the right expertise is also highly desirable and necessary for proper guidance and help for residents in lowering their energy bills. A long-term relationship based on trust is important for achieving savings. Corresponding recommendations emerged in the national meeting of January 19, 2023.

Compared to the Energy Voucher promotion in Zeist, the Energybox is a more time-intensive and more expensive approach. The voucher approach leads to lower savings than with the Energybox. For a municipality, it is a challenge to search for an optimum between impact and the number of people reached with a project.

Energy saving measures distributed in **combination with coaching and installation and repeat visits, achieve the highest effects on the energy bill.** The same insight counts for reaching tenants.

It is necessary to do it all: **flyers, posters, e-mails, door-to-door-visits, events and working together with the social network**. The approach should be tailor-made. As a municipality and as the executor of a project, it is important to thoroughly study the target group you want to reach. On top of that projects should facilitate a long-term relationship with the tenants.

[32] Willems, T. Rietbergen, M., Vrielink. N. (2022): Evaluating the Energy Voucher: An experience analysis of a Local Dutch initiative to alleviate energy poverty (not yet published article)

9 CONCLUSION

The collective experiences of ENPOR from Austria, Germany, Estonia, Greece, Croatia, Italy, and the Netherlands offer valuable insights into the multifaceted approach to addressing energy poverty in the private rental sector. Across these countries, several key themes emerge, emphasizing the importance of targeted and inclusive measures, stakeholder engagement, and flexible adaptation in combating energy poverty. The unique approach of ENPOR, with the established REACT groups in all target countries, enabled the successful implementation of various measures tailored to each national context. As a result, the REACT groups provided an ideal tool to support alleviating energy poverty in the private rental sector and also raised awareness among new stakeholders for this particularly complex area.

The implementation in Austria highlights the significance of tailoring information and advice to specific target groups. The successful incorporation of figurative language in advisory materials underlines the potential of effective communication strategies. Additionally, the inclusion of translations and the cooperation with the Ministry of Climate Action to enable nationwide adoption showcase the importance of accessibility and stakeholder collaboration.

The experience of ENPOR in Germany emphasizes the value of well-designed advisory tools and diverse stakeholder engagement in influencing household behaviors. Strategies such as gamified self-learning activities and visual aids bridge language barriers effectively. However, the complexities of technological interventions highlight the need for flexibility and sufficient resources.

ENPOR's focus on inclusivity in renovation grants in Estonia demonstrates a strategic approach to address energy poverty. The commitment to renovate buildings to a C-energy class by 2050 and the challenges presented by individual apartment ownership call for innovative and inclusive solutions.

The efforts of ENPOR in Greece in supporting the renovation of buildings and raising awareness through targeted campaigns show promise in addressing energy poverty in the private rental sector. The emphasis on inclusivity, financial accessibility, and local involvement highlights a comprehensive approach.

Croatia's updated programs and data-driven policy formulation through the ENPOR project offer insights into tackling energy poverty. The importance of transparency, inclusivity, and collaboration with stakeholders are central to the country's progress.

Italy's "Italia in Classe A" program demonstrates a proactive approach to combatting energy poverty in the private rental sector through education, advisory tools, and awareness campaigns. Targeted handbooks and student engagement represent promising strategies for future initiatives.

In the Netherlands ENPOR supported the successful continuation of measures and diversification of options available to municipalities. The expansion of stakeholders, such as civil society organizations, has enriched the country's multifaceted approach to mitigate energy poverty. The Energybox project's success in reaching residents and supporting households further underlines the effectiveness of the various approaches of ENPOR.

In summary, the experiences of ENPOR in these seven countries underscore the need for customized, inclusive, and locally rooted measures in addressing energy poverty in the private rental sector. Stakeholder engagement, flexible adaptation, and collaborative efforts with various partners are essential components of effective energy poverty alleviation strategies. The lessons learned from these countries can serve as valuable guidance for other nations seeking to combat this pressing issue and promote long-term positive change in energy efficiency and affordability.