



Actions to Mitigate Energy Poverty  
in the Private Rented Sector

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# D3.6 MONITORING OUTCOMES

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# 1 INTRODUCTION

## 1.1 Objectives

One of ENPOR's main objectives has been to support the adaptation of 10 energy efficiency policies to include measures to alleviate energy poverty in the private rented sector (PRS) within seven Member States (MS), namely Austria, Croatia, Estonia, Germany, Greece, Italy, and the Netherlands. ENPOR has therefore undergone a co-creation process where the 10 existing policies or measures (herewith referred to as policies) were redesigned with the help of REACT Groups<sup>1</sup> from each country, as presented in **D3.4 Guidelines on setting up policies according to best practices and country specific circumstances** and **D4.7 Final Update of National Stakeholder Engagement Strategies**. Through the co-design process, national and regional governments were supported in adapt policies to suit the ever-growing energy needs of tenants in the PRS. Following the policy re-design process, ENPOR assisted in the implementation of the policies in each aforementioned MS, for which more information can be found in **D3.5 Report on the implementation of the ENPOR policies**.

This report presents the monitoring methodology used in ENPOR to keep track of the overall project's impacts to determine the effectiveness of policies, the number of policymakers and stakeholders influenced, as well as energy savings and investments triggered by the implementation of the policies.

The monitoring framework was created to identify potential problems, bottleneck and ineffective design elements in the 10 policies, ensuring early course correction and improvement, while also tracking early successes for replication amongst other policies, where possible. The framework includes key performance indicators and simplified monitoring sheets to track the effectiveness of the policies. To monitor the impact of the proposed policies for households and property owners, a baseline and an outcome evaluation was performed, using collection methodologies detailed within this report. In this process, each partner in charge of co-creating and implementing ENPOR policies within their geographic areas were also responsible for:

- Providing technical support for the effective monitoring and quantification of the triggered impacts from the implementation of the policies.
- Collecting the required data for the monitoring and identifying areas for improvement.
- Quantifying additional impacts (e.g., comfort level increase) based on questionnaire surveys with the involved energy poor households.
- Suggesting proposals for the potential readjustment of the policies according to the established targets and requirements.
- Proposing additional and more effective data collection procedures.

This data was used to improve the relevance and impact of each policy, while its collection helped to evaluate the policies' progress based on a core set of KPIs. The outcomes of the codesign and implementation process were validated in the last of the national meetings within each country, while the REACT groups qualitatively assessed the outcomes of the final policies.

IEECP has been responsible for monitoring the outcomes of the policies, ENPOR's capacity building activities, and the overall project's impacts. Partners leading the co-design of the policies (CRES,

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<sup>1</sup> REACT groups are stakeholders' groups with the aim to co-create the ENPOR policies, discuss insights, provide monitoring data and facilitate the adoption of the policies. More information can be found on D4.1 Engagement strategies of the REACT groups for each support scheme.

DOOR, TREA, ENEA, AEA, WI and HU) were also involved in these tasks and were responsible for:

- Identifying issues in the design of the policies in their respective countries;
- Coordinating authorities to launch the policies in their country;
- Reviewing and implementing the monitoring framework; and
- Providing data on the policies' implementation for monitoring.

## 1.2 ENPOR Policies and workflow

The policies discussed and adapted through the REACT groups meetings are presented in Table 1. The selection of the policies was based on their significant contribution to the alleviation of energy poverty until 2030. Other factors determining their impact included their focus on an urban location (inner city/core urban area/suburban), governance arrangements, predominant mode of financing, principal energy supply mode, energy efficiency of the housing stock, and level of political participation. The policies are clustered within the following four groups:

- Grants for building renovations, including fuel switch and small-scale renewables;
- Training & Information (soft measures);
- Programme support action, including guidelines to better identify energy poverty and concepts for structural energy poverty mitigation; and
- Energy Efficiency Obligation Schemes (EEOS).

The policies were implemented and assessed to allow for cross-comparisons to be made, and useful lessons to be drawn for their replication across the EU.

**Table 1: ENPOR policies per country**

Policy type	Pilot policy in ENPOR / Name of scheme	Country
Grant for renovation	National reconstruction grant	EE
	Energy upgrade of buildings	GR
	National Programme for Renovation of Buildings	HR
Training and information	Low-threshold, target group specific consulting	AT
	Heating related energy advice	DE
	Pre-paid metering app	DE
	Training and Information Campaign	IT
Programme support	Energy Box	NL
	Concept for structural energy poverty mitigation	AT
EEOS	Energy Efficiency Obligation Scheme (EEOS)	GR

The interventions in the design and implementation of the ten energy efficiency policies were structured in four major steps which are illustrated in the table below.

**Table 2: ENPOR workflow of policies**

Pilot policies: Steps	Description
<b>Identification of groups (Step 0)</b> - Application of methods to identify energy poverty.	Based on national datasets and stakeholder insights, areas with relatively high shares of energy poor residents in the PRS were identified.
<b>Design (Step 1)</b> - Support the set-up of policies	ENPOR supported MS by adapting ten existing policies according to the needs and capabilities of tenants and landlords as well as their

	<p>implementing authorities. The policy intervention design was informed by international experiences, a clear methodological framework for the PRS, and a detailed policy support design.</p>
<p><b>Launch intervention (Step 2)</b> - Activities directed at the setting up and implementation of policies specific to each target group.</p>	<p>ENPOR partners were the key actors (i.e. energy agencies, association of property owners and others) involved in the implementation of policies together with the REACT groups and the Policy Forum. All necessary support was foreseen for the coordinating authority so that the policies could be realised.</p>
<p><b>Monitoring (Step 3)</b> - Ex-ante evaluations were carried out in line with the continuous monitoring of policies, both on household and programme levels.</p>	<p>The monitoring indicators developed were be applied, and the implementation outcomes of the policies were be quantified in terms of the benefits they delivered. The indicators for alleviating energy poverty therefore disentangled effects such as rebound or structural effects and informed the policy support actions which have been summarised in WP5 reports (see <a href="#">here</a> for Deliverables 5.1 through 5.7).</p>



## 2

### MONITORING FRAMEWORK

Monitoring and evaluation have been a constant and important activity in ENPOR, allowing for the early detection of potential problems and thereby providing sufficient time to adjust project strategies to ensure that the desired outcomes can be realised. Therefore, the monitoring framework provided the means to determine if the policy developments in each country were on course to achieve the envisioned impacts. There were two sets of monitoring activities performed within ENPOR, which are presented in Table 3.

**Table 3: ENPOR Monitoring sets**

Monitoring set	Description	Chapter
<b>Short-term project impacts</b>	Monitoring the project impacts in terms of effectiveness of policies as well as number of policymakers and stakeholders influenced. This includes monitoring of the capacity building activities and the Energy Poverty Dashboard.	Chapter 3
<b>Policies (long-term) impacts</b>	Monitoring energy saving, CO <sub>2</sub> reduction, investments triggered, energy poverty alleviation, and other factors related to the implementation of the ten policies. The monitoring also aimed to identify potential problems, ineffective design elements and served for early course correction. It included key performance indicators and simplified monitoring sheets.	Chapter 4

The following chapters describe the monitoring methods and indicators for each of the two monitoring sets. In both of these sets, IEECP had led the development of the monitoring framework, while acknowledging the inputs and suggestions from consortium partners. This provided the necessary tools (e.g., survey links, excel sheets) for the data collection and monitoring activities, and for the evaluation of the monitoring outcomes and for communication among partners. The responsible partners for the policies, capacity building and other activities were also accountable for collecting the necessary data and providing technical support for the effective monitoring and quantification of the impacts from the implementation of the policies. In addition to the monitoring sets, the monitoring framework covers the process of development and implementation of the monitoring activities, which follows the three phases below:

#### **Phase 1 – Definition of monitoring framework:**

- Determination of the monitoring concepts (e.g. energy poverty, wellbeing, etc.)
- Establishment of key metrics and parameters of each KPI
- Definition of the baseline data for the purpose of monitoring the policies' performance
- Preparation of the monitoring framework

#### **Phase 2 – Monitoring:**

- Consistent monitoring and collection of data
- Monitoring of policies' implementation

#### **Phase 3 – Evaluation and continuous monitoring:**

- Evaluation of the monitoring outcomes for adjustments of the activities
- Continuous monitoring of the activities after adjustments, ensuring feedback loops with the redesign and implementation of the policies, capacity building activities, and project management)

3

**SHORT-TERM PROJECT IMPACTS**

**3.1 Expected short-term project impacts**

The main target group of ENPOR was energy poor households in the PRS, which received support from the chosen ten policies to improve their energy and related monetary situations. As a means for monitoring the achievement of set goals, ENPOR partners offered input on the status of the desired outcomes in close collaboration with the REACT groups. At least 2-4 of each partner’s national and local governance bodies and up to 2-3 of EU governance bodies were foreseen to be influenced by the project, totalling up to 50 governance bodies referring to the project.

**Table 4: Short-term project impacts (bottom-up estimation)**

Relevant expected impacts	Project activity to achieve impacts	Key Performance indicators
Contribution to policy development and to best practice development on energy poverty;	<ul style="list-style-type: none"> <li>National half yearly REACT group meetings in 7 MS</li> <li>Regional meetings in Zagreb, Vienna, Athens</li> <li>3 EU workshops</li> <li>Capacity building webinars</li> <li>Webinar for EPD and for validating policy outcomes</li> <li>Policy recommendations</li> <li>Insights into policy development and success factors (WP2)</li> <li>Enabling ground for setting up policies (WP3)</li> </ul>	<ul style="list-style-type: none"> <li>Ten policies influenced</li> <li>Introduction of at least 5-6 new agenda points in the EU level debate on energy poverty in the PRS by the Policy Forum on CoM, EU POV, UIPI, EC and European Parliament for a</li> <li>At least 5 policy makers per country and 70% of policy makers respond that the workshop will contribute to their work with combating energy poverty</li> </ul>
Policies established for energy efficiency and/or small-scale renewable energy investments and to be sustained beyond the period of EU funding	<ul style="list-style-type: none"> <li>Influencing factors of policies for energy poverty</li> <li>Desktop research and input from REACT groups meeting and 3 regional meetings</li> <li>Launching policies</li> <li>Releasing the EPD</li> </ul>	<ul style="list-style-type: none"> <li>Ten policies established</li> <li>Adoption of the EPD outcomes and work by the Policy Forum</li> <li>Discussions on replication of the policies to at least 10 more cases (on national, regional or local level)</li> <li>At least 50% of REACT participants to respond that they consider the planned policies to be realistic and achievable</li> <li>At least 75% of scheme implementers declaring by the end of ENPOR that they will continue their scheme</li> </ul>
Involvement of at least 5.000 consumers per million Euro of EU funding	<ul style="list-style-type: none"> <li>Implementing policies in 7 MS</li> <li>EPD engages all target groups by:               <ol style="list-style-type: none"> <li>Communicating information to decision-makers and key stakeholders</li> </ol> </li> </ul>	<ul style="list-style-type: none"> <li>Over 135,000 households involved in energy retrofits and other activities through the REACT groups</li> <li>30 decision-makers used EPD to inform policy or local decision-making</li> </ul>

- |   |  |
|---|--|
| <p>2) Collating information about policies for energy poor households, facilitating knowledge exchange between policies and providing a forum to engage people in local decision-making</p> | <ul style="list-style-type: none"> <li>• 50 experts used tool in workshop</li> </ul> |
|---|--|

### 3.2 Short term monitoring methodology

The monitoring methodology included the collection, documentation, and analysis of data for monitoring purposes. Data collection was accomplished by all national partners, through various methods, and saved in files dedicated to monitoring purposes. To ensure a clear and easy monitoring process, the following monitoring files were created to save the collected data:

1. **“Stakeholder Engagement Monitoring” file:** An excel file in which all national partners filled in quantitative information related to the meetings and other stakeholder engagements, from REACT Groups workshops to bilateral calls. It was mainly used to assess the number of participants, types of stakeholders involved, gender aspects, number of meetings, among other.
2. **“Meeting minutes template” word file:** A meeting minute template to be implemented by all partners for documenting relevant qualitative and quantitative information about the meetings with stakeholders from the REACT Groups. All information gathered has been stored in a communal REACT Group folder.
3. **“T3.3 Monitoring Impact” excel file:** The file compiles all information collected throughout the project for monitoring purposes, including aggregate information from the “Stakeholder Engagement Monitoring” file and relevant highlights from the “Meeting minutes”. It was accessible to the entire consortium, but mainly used by IEECP. It has been constantly updated to keep track of the achievement of short-term project impacts.

The files supported the documentation of relevant data for monitoring purposes, including those with specific information about the REACT groups. However, data has also been gathered through the following monitoring methods:

- **Bilateral interviews with REACT members to report country context and policy changes:** During the policy co-creation phase, the national partners routinely contacted the REACT group stakeholders to ensure that the workshops contribute to their work with combating energy poverty.
- **Satisfaction survey:** An evaluation form was developed by IEECP in close collaboration with the national partners. The survey was translated to all ENPOR country languages and developed using EUSurvey platform, with dedicated links to each language. The national partners either printed the survey (in case of physical meetings) or sent the link to the participants for collection feedback on how they evaluate the co-creation process for adaption of the policies at various stages.
- **Literature review and observation:** This was done for the collection of statements from policy makers or national policy legislative documents.
- **Survey with REACT Groups:** To assess if the REACT groups considered the planned policies to be realistic and achievable, as well as their satisfaction with the entire co-creation process.
- **Monthly WP3 meetings:** Each national partner reported the status of the policy co-creation process, potential challenges and solutions to overcome such challenges.

## POLICIES & LONG-TERM IMPACTS

### 4.1 Estimated impacts on energy savings, investments, and CO<sub>2</sub> emission reduction

To estimate total energy savings for the definition of KPIs prior to the launch of the project, a distinction was made between savings generated directly by the ENPOR policies and savings indirectly calculated for the project through outreach and upscaling activities. More specifically, a comparative table on the savings and wider effects, such as cost savings and renovations, is presented below, with similar country assumptions - as presented and explained in the footnotes, including the origin of some values.

Given that the policies refer to financial information and market-based ones, bottom-up methodologies were applied to calculate the delivered impacts. To this goal, the methodological framework of the multEE project<sup>2</sup> was utilised: high-end value of 20% of the overall target group, the average kWh energy consumption per household, the maximum percentage of potential savings - with a high-end value of 30% for insulation measures and 5-10% for behavioural ones. Conversely, in other cases that targeted renovation, the country average floorspaces per households were included.

Table 5: Impacts from the ENPOR policies

Relevant expected impacts	Households	Savings (GWh)	Assumptions	Other effects
Pre-paid metering app (DE)	9,800	3.53 <sup>3</sup>	2700 kWh <sup>4</sup> , 10% savings and 50% affected	€0.44 ME cost savings = (3.52*0.35)
Heat energy advice (DE)	500	0.45 <sup>5</sup>	10.500 kWh <sup>6</sup> , 10% savings and 50% affected	0.03 ME cost savings = (300,000*8.08 <sup>7</sup> )
Ecobonus with soft measures (IT)	200	3	3.5 GWh <sup>8</sup> , 2% savings and 20% affected	0.37 m€ cost savings (final energy savings * energy price)
Target Group consulting (AT)	500	0.10	225kWh/m/a <sup>9</sup> , 60m2 average flat size, 15% savings and 10% affected	3,000 m2 renovations (60m2*households)
Thermal renovation (AT)	10,000	6.75	225kWh/m2 /a 60m2 average flat size, 50% savings and 10% affected	60,000 m2 renovations (60m2*households)

<sup>2</sup> <https://multee.eu/>

<sup>3</sup> Calculated using a primary energy factor of 2.8 for the German power mix. 34 Average yearly electricity consumption of households supplied by EnergieRevolve.

<sup>4</sup> Average yearly electricity consumption of households supplied by EnergieRevolve

<sup>5</sup> Calculated using a primary energy factor of 1.14 based on the primary energy factors for different energy carriers and their share of use for household heating in Germany.

<sup>6</sup> Energy poor household heat energy consumption for a 70m2 dwelling assuming an average energy demand of 150 kWh/m2/a.

<sup>7</sup> Weighted price for one kWh of heat energy considering the share of different energy carriers for heating in Germany.

<sup>8</sup> The average household consumption in Italy is 17,550 kWh – or 1,5 tep (ENEA elaboration on 2017 data of the Italian Regulatory Authority for Energy, Networks and Environment) and the energy consumption per m2 is 170 kWh/m2 (Long Term Renovation Strategy 2017)

<sup>9</sup> The average living space per person in Vienna is 35m2 and per household 70m2 (with an average size of 2.07 persons per household).

Energy poor households have an average of less space available, thus we approximated 60m2 (see Wien in Zahlen + own calculations, <https://www.wien.gv.at/statistik/pdf/wieninzahlen-2018.pdf> own calculations,

<https://www.buildup.eu/sites/default/files/content/Mrs%20Becchio%20article.pdf> , and

[https://www.econtrol.at/documents/1785851/1811582/energiearmut\\_in\\_oesterreich\\_2016.pdf/54199124-f688-7aaa-3f46-8ab259d1d4c7?t=1553792496267](https://www.econtrol.at/documents/1785851/1811582/energiearmut_in_oesterreich_2016.pdf/54199124-f688-7aaa-3f46-8ab259d1d4c7?t=1553792496267))

Energy upgrade (HR)	1,470	22.04	200 kWh/m <sup>2</sup> <sup>10</sup> , 75m <sup>2</sup> average flat size	110,218 m <sup>2</sup> renovations (75m <sup>2</sup> *households)
National reconstruction grant (EE)	5,000	0.59	3.9 <sup>11</sup> , 5% affected and 30% savings	8,500 m <sup>2</sup> renovations (1700m <sup>2</sup> *5 buildings)
Energy Efficiency Obligations (GR)	100,000 <sup>12</sup>	23.23	7955kWh <sup>13</sup> , 20% affected and 10% savings due to soft actions	2.4 million € cost savings (final energy savings*energy price)
Energy upgrade of buildings (GR)	5,000	65.56	163.9 kWh/m <sup>2</sup> , 80m <sup>2</sup> average flat size <sup>14</sup>	800,000 m <sup>2</sup> renovations (80m <sup>2</sup> *households)
Energiebox (NL)	5,000 <sup>15</sup>	10 <sup>16</sup>	10% savings	0.76 million € cost savings <sup>17</sup>
<b>Total</b>	<b>137,470</b>	<b>135.24</b>		

For the totality of the ENPOR project, the maximum primary energy savings triggered from the ten policies could be 135.24 GWh/year, when using the same assumptions in PRS households in the EU-28. Indeed, it was assumed to be possible to reach a cumulative 405.72 GWh during the project itself, considering that the policies would have been in place for only three years. As described above, we estimated ENPOR policies to directly influence 137,470 dwellings during its course, or around 320,000 consumers if we assume an average size of 2.3 persons/household<sup>18</sup>.

In the longer run, it was estimated that ENPOR could also indirectly impact additional energy poor households in the PRS through dissemination channels and EU outreach. To approximate this number, there were 220 million households in the EU<sup>19</sup> in which 7 out of 10 people live in owner-occupied dwellings - 69.3 %, while 20.0 % are tenants with a market price rent, and 10.7 % are tenants in reduced-rent or free accommodation<sup>20</sup>. Approximately 11% of households in the private sector, as well as 10.6 % of owner-occupiers were unable to keep their home adequately warm<sup>21</sup>.

<sup>10</sup><http://www.gskg.hr/UserDocImages/Energetska%20obnova/Energetska%20u%C4%8Dinkovitost%20zgrada/Program%20energetske%20obnove.pdf>

<sup>11</sup>3,9 MWh of annual energy saving per dwelling can be achieved by this type of renovations (based on calculations from outcomes of previous renovations using the national renovation grant, published by grant holder KredEx in 2014)

<sup>12</sup> Taking into account that the energy poverty levels in Greece ranging from 30%-40% of the total households (approximately 4 million households), it can be deducted that the targeted energy poor households represent 31%-42% of the total households, while the 500 thousand affected energy poor households are assumed to be equal to 6%-8%. The description of the support scheme for the energy upgrade of the building of the energy poor households in Greece has been included in the NECP, which was submitted in the end of 2019. Moreover, CRES will integrate the foreseen support scheme among the planned policy measures within the framework of the National Action Plan for the confrontation of the Energy Poverty, as it is considered as one of the most effective measure. Consequently, the targeted support scheme seems to be a priority for the alleviation of the energy poverty in Greece. Moreover, alternative measures will be proposed for the case of a potential delay, such as indicatively the integration into the Energy Efficiency Obligation Scheme of the electricity and natural gas distributors with the obligation to undertake the buildings' energy upgrade of the energy poor households

<sup>13</sup> Average final energy consumption of a Greek household transformed in primary energy according to the proposed methodology in NEEAP of 2014 (Eurostat 2015).

<sup>14</sup> The values are also comparable to the results of the "Energy Savings at Home" program since similar energy efficiency interventions will be financed.

<sup>15</sup> Based on the percentage of households affected by energy poverty (4 – 10%) according to PBL (2018) and ECN (2017) and the number of private rented dwellings in the province of Utrecht (77,000)

<sup>16</sup> Based on the number of affected households (5,000), expected primary savings of 10% on the annual energy bill, and an annual primary energy use of 21,410 kWh per household.

<sup>17</sup> Costs savings on reduced energy bill per household (151 € with 5,000 households)

<sup>18</sup> EU average household size in 2016: 2,3 [http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=ilc\\_lvph01&lang=en](http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=ilc_lvph01&lang=en)

<sup>19</sup> <https://www.euronews.com/2017/09/05/people-living-alone-europe-solo-living>

<sup>20</sup> [https://ec.europa.eu/eurostat/statistics-explained/index.php/Housing\\_statistics#Type\\_of\\_dwelling](https://ec.europa.eu/eurostat/statistics-explained/index.php/Housing_statistics#Type_of_dwelling)

<sup>21</sup><https://www.energy-poverty.eu/indicator?primaryId=1461&type=bar&from=2016&to=2016&countries=EU&disaggregation=ten>

In relevant policies for energy poverty, the average response rate could have stretched to 0.8%<sup>22</sup> allowing ENPOR to deduce that it could indirectly influence 197,120 additional households<sup>23</sup> or 450,000 consumers. Given the average energy consumption per dwelling was 16,165 kWh, as reported by ODYSEE, the overall indirect effect could lead to 63.7 GWh per year energy savings, equating to 191.2 GWh/year for 3 years after ENPOR if we accounted for the 2% savings due to soft measures from relevant policies. This latest value only reflects the lifetime of behavioural measures.

To calculate CO<sub>2</sub> savings, EUROSTAT data (2015) was used, with a conversion rate of 1.5 from primary to final energy consumption as well as the Odyssee-Mure (2015) data per EU MS on tCO<sub>2</sub> for households<sup>24</sup>, which amounted to 704.9 MtCO<sub>2</sub>. Based on this, the ktnCO<sub>2</sub>/GWh from households was 0.218 when dividing the aforementioned number with the total Final Energy Savings of all households in the EU<sup>25</sup>. Thus, we estimated that the total expected impact by the ten pilot policies of 135.24 GWh could lead to 19.5 ktCO<sub>2</sub> reduction per year over the project's duration, and 9.2 ktCO<sub>2</sub> 5 years after the project's end.

In regard to the investments for energy retrofits, the direct impacts of ENPOR policies could potentially lead to 980,000 m<sup>2</sup> of retrofits with an average modest investment cost of 60 EUR/m<sup>2</sup><sup>26</sup> returning up to €58.8M in investments. In the long run, we did not expect an increase in the investment amount as mainly softer measures will be applied within the project. The actual results achieved by the project are described in Chapters 5 and 6.

**Table 6: Project indicators originally foreseen**

Project Performance Indicator	Quantification within ENPOR	Quantification 5 years after ENPOR	Measurement unit
Primary energy savings triggered by the project	135.24	63.7	GWh/year
Investments in energy retrofit triggered by the project	58.8	58.8	million EUR
Contributions to policy development and to best practice development on energy poverty	10	15	# of influenced document
Policies established/adjusted for energy efficiency and/or small-scale renewable energy investments and to be sustained beyond the period of EU support	10	15	Number of schemes
Involvement of at least 5,000 consumers per million Euro of EU funding	320,000	450,000	# of households
Reduction of greenhouse gases emissions (in tCO <sub>2</sub> - eq/year)	19.5	9.2	ktCO <sub>2</sub> - eq/year

<sup>22</sup> Response rate in relevant programs in Ireland, presented by SEAI (2019) in the Third Meeting of the Task Force on Mobilizing efforts to reach the EU energy efficiency targets for 2020, European Commission (10 July 2019).

<sup>23</sup>  $\{[220 \text{ million households}] * [11.2\% \text{ market rent levels of EP}] * [0.8\% \text{ average response rate}]\}$

<sup>24</sup> A CO<sub>2</sub> factor for each MS with electricity was used. If we were to assume that the measures in apartments will affect mostly heating, we could use specific factor for heating per country, but as the measures might affect a range of electrical appliances and a different mix of fuels, we opt for this one.

<sup>25</sup> The Total Primary Energy Savings in the EU (Eurostat) are 17,945,976 GWh in 2015 and the final energy consumption is 11,919,100 GWh, therefore the Final Energy Savings are 3,240,131 GWh. Dividing the total emissions in 2015 with the Final Energy Savings generates the ktnCO<sub>2</sub>/GWh (0.218) from households.

<sup>26</sup> [http://www.europarl.europa.eu/RegData/etudes/STUD/2016/587326/IPOL\\_STU\(2016\)587326\\_EN.pdf](http://www.europarl.europa.eu/RegData/etudes/STUD/2016/587326/IPOL_STU(2016)587326_EN.pdf)

## 4.2 Long-term monitoring methodology

To keep track of the achievement of such impacts, the implementation of the policies was closely monitored. The monitoring of the policies' impacts had three objectives:

1. To foresee the long-term impacts explained above;
2. To observe the alleviation of energy poverty;
3. To monitor policy implementation for the course correction in the redesign process, if needed.

The monitoring methodology included key performance indicators that were based on the ENPOR tasks of *upgrading the framework on energy poverty in the private rented sector* and *the development of the **Energy Poverty Dashboard** tool*, as well as on the material presented in Chapter 3.2 and monitoring sheets. Overall, the implementation of the policies has been monitored as follows:

- **Monthly WP3 meetings:** Each national partner reported the status of implementation of the policies, potential challenges (e.g., related to collecting data and information), and discussed solutions and ideas to overcome challenges and/or improve the implementation of the policies.
- **Questionnaires and/or interviews:** Conducted by the national partners with the implementing bodies, to collect relevant information and data. In case templates were needed for surveys, these would have been developed by IEECP with the collaboration of the national partners.
- **Monitoring sheet:** Excel file to gather relevant information from the policies implementation, provided during the monthly meetings and/or collected by the national partners, for continuous assessment and feedback loops with T3.1.

We acknowledge that the monitoring of energy savings by way of theoretical savings in kWh would not accurately reflect the effectiveness of the interventions as an inherently intrinsic value for all schemes that promote energy efficiency. In fact, we are aware that actual measurement of savings through monitoring energy consumption would increase the reliability of the assumptions made. In the situations where energy providers were responsible for specific activities (e.g., under EEOS) they provided their own data from their customers, however for several cases, estimations had to be made as behavioural measures are difficult to monitor and quantify.

## MONITORING METHODOLOGIES PER COUNTRY

The data collection and monitoring methods applied by the national partners, in accordance with their context, are explained in the next subsections.

### 5.1 Monitoring methodology in Austria

#### 5.1.1 Description of the measure/policy, adaptation through the REACT groups, and comparison to the baseline scenario

##### 5.1.1.1 Low-threshold, target group specific consulting

The energy consumption of households in the PRS is largely dependent on factors that are outside the tenants' direct sphere of influence such as thermal condition of the building. Nevertheless, tenants themselves could improve their own living situation, at least to a certain extent. Therefore, the need for easy and economical to implement solutions for energy poor households is an important starting point for the elaboration and employment of measures to reduce their energy consumption or energy costs. Indeed, many energy poor people already show energy-saving behaviours, but often try to do so by sacrificing their living comfort: this can be counteracted by selecting and forwarding suitable measures.

Within the project's framework, new policies were created through which energy poor households in Austria could be supported in a more targeted manner. The aim was to avoid repetitions while complementing the existing support network by integrating available sources. For this purpose, the consortium collaborated with DIE UMWELTBERATUNG, which has been offering energy counselling for energy poor households in the target region of Vienna for many years. Hence, within the collaborative environment of the REACT group's co-creation process, we collectively identified the specific measure that would significantly enhance advisory services for the households in need.

The work in the REACT group, with especially 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 novel versions within the framework of ENPOR. However, these materials were intended to differ from previous suggestions at this level by placing a clear focus on figurative language and thus offering a clear advantage for hard-to-reach target groups by conveying information with as few words as possible and a clear focus on illustrations and pictograms. This allowed to overcome linguistic hurdles or hurdles resulting from a lack of background knowledge.

In the target region of Vienna, support services for low-income households were already available. These services range from on-site consultations to various information materials. However, the existing information and support formats were often not prepared in a suitable form, as the target group often lacks time, resources and educational background to deal with sophisticated tools and detailed materials, while usually energy poor households are not specifically targeted either. The benefit of this measure laid not in increasing the number of counselling sessions, but in refining existing services to be more tailored to specific groups, thereby enhancing their effectiveness.

##### 5.1.1.2 Development of a concept for structural energy poverty mitigation measures

The second of Austria's policies (financial support scheme for thermal refurbishment measures for



low-income households) changed over the course of the project as the Austrian Energy Agency was not directly involved in the implementation, with the policy having been delegated to other organisations (the Federal Provinces and the Climate and Energy Fund), thereby preventing AEA to participate. However, during the REACT group meetings and the close exchange with the Ministry of Climate Action, it became clear that policy proposals for structural measures to alleviate energy poverty are needed to help 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

The proposals developed were incorporated into the Ministry's policy design and were taken into account, for example, in the definition of the activities of the new Coordination Office for Energy Poverty in Austria. This enabled an important impact to be achieved at the policy level, although this cannot be quantitatively assessed.

### **5.1.2 Data collection and monitoring methods**

A direct quantitative assessment of the impact was not possible, but a qualitative evaluation of the new materials by energy poor households took place. This involvement was crucial to ensure the development of targeted interventions that meet their needs and challenges. The developed materials were tested in a pilot phase directly in the counselling work of DIE UMWELTBERATUNG in the course of about 50 counselling sessions for energy-poor households in Vienna, as the province in Austria with the highest proportion of people at risk of poverty. This step ensured that the contents developed were clear, comprehensible and case-relevant. Afterwards, households were asked to provide feedback on the materials for us to directly listen from those impacted by energy poverty about their assessment of the clarity and relevance of the new information sheets. The agency then reviewed the feedback and, where needed, updated the materials in collaboration with the graphic designer. This approach facilitated a qualitative assessment of the impact on each household. By making the developed materials widely accessible and distributing them to various social organizations across the nation, we ensured their long-term utilization and a lasting effect.

After the implementation of the measure, the number of households advised with the materials was communicated directly by DIE UMWELTBERATUNG. Using this data, we could project additional outcomes, such as energy savings. An additional evaluation of the impact was conducted based on the stakeholders engaged who consented to incorporate the materials into their advisory services or communications. Information regarding their activities informed a further quantitative estimate of the impacts realized, akin to the impact assessment conducted for the ENPOR project. This information was provided to the project by the federal climate protection initiative klimaaktiv, which made the materials available to advisory centres throughout the country on behalf of the ministry.

**Table 7: Austria's data collection methods**

Project Indicator	Performance	Method(s) for data collection	Data Source
Primary energy savings (GWh/year)		Were estimated based on the included energy saving tips and an assumed implementation rate of the advised households and other reached stakeholders.	Information from DIE UMWELTBERATUNG on the number of advised households and the federal climate protection initiative klimaaktiv, which made the materials available to counselling centres throughout the country on behalf of the ministry.
Number of influenced documents - Statements from policy makers or national policy legislative documents		Could be found out through direct exchange with the ministry or the political level.	Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology.
Number of households impacted by the policy		The number of households assessed with the help of the materials could be obtained directly from DIE UMWELTBERATUNG and klimaaktiv.	Direct information from DIE UMWELTBERATUNG and the federal climate protection initiative klimaaktiv, which made the materials available to counselling centres throughout the country on behalf of the ministry.
Reduction of greenhouse gases emissions (in tCO <sub>2</sub> -eq/year)		Were estimated based on the included energy saving tips and an assumed implementation rate of the advised households and other reached stakeholders.	Information from DIE UMWELTBERATUNG on the number of advised households and the federal climate protection initiative klimaaktiv, which made the materials available to counselling centres throughout the country on behalf of the ministry.

### 5.1.3 Policy and Project Impacts

#### 5.1.3.1 Number and type of stakeholders

**Table 8: Austria's REACT and Target group stakeholder composition**

	Number of meetings	Landlords	Co-owners' associations	Tenants	Charitable and social work associations	Energy Agency / Energy consultants	Local policymakers	Regional policymakers	National policymakers	Utilities	Citizens groups / NGOs	Other (specify)
REACT	14	0	2	0	3	16	0	0	26	0	0	1 (academia) 4 (chamber of labour) 3 (other)
TARGET	1	0	0	0	2	7	1	0	0	0	0	1 (academia)

#### 5.1.3.2 Gender of participants in REACT groups

**Table 9: Austria's REACT and Target group gender composition**

	Male	Female	Ratio
REACT	20	35	0.57:1
TARGET	5	11	1:2.2

### 5.1.3.3 Number of decision makers that used the tool to inform policy or local decision making and/or number of experts that used the tool in workshops

The EPD was presented at two REACT group workshops and during a conference in Vienna. A total of 80 people were present at these three events. Of these, 5 decision makers used the tool to inform policy or local decision-making and 10 experts used the tool during the workshops.

### 5.1.3.4 Discussions on replication of the policies

The developed materials and proposed measures were very positively received and implemented or supported by policy makers. In fact, 95% of policy makers responded that they found policies applicable to their country context.

### 5.1.3.5 Meeting expectations of REACT groups

Through a survey, it was verified that the stakeholders engaged in the REACT group meetings were very satisfied with the outcome and stated that their expectations were very well met.

### 5.1.3.6 Annual primary energy savings triggered by the project

During the ENPOR project about 130,000 pieces of new counselling and information materials have been ordered by counselling organisations, both from the social and energy sectors. These materials were used directly for advising households and not just distributed to them.

Based on the *utility energy analysis for Austria*, the average electricity and space heating and air conditioning final energy demand of an Austrian household was calculated. This resulted in 2,900 kWh for electric appliances and 20,600 kWh for space heating and cooling on average per year per household in Austria (data basis 2021).

Based on two sources, an estimate was made of how high the savings that could be achieved by each consultation with our materials were. One of them was the *official methodology document of the Energy Efficiency Monitoring Office in Austria*, which was also used for such questions in the past, as well as a *study of the American Council for an Energy-Efficient Economy*, which deals with the impact of behaviour change programmes. Based on the results from these two sources, which are quite close to each other, a very conservative estimate was made that per consultation with the material, energy consumption decreases by 1%. Taking into account that the use is done in consultations, and the material is additionally available in various languages, becoming more accessible to households, this remains a very conservative estimate.

In the calculation, it was accounted for how many of the factsheets related to electric appliances (33.3%) and to heating and cooling (66.6%).

The calculation resulted in total energy savings of 19.11 GWh triggered by our material used in counselling alone during the length of the project (three years, hence **6.37 GWh/year**). However, there might be savings effects from freely distributed print versions (i.e., at fairs), from downloading, and possible use at the international level through the translated versions, which cannot be quantified. Therefore, the actual impact is virtually greater. If we were to distribute these savings **over 5 years following the end of the project**, the savings would amount to an additional cumulative **31.85 GWh**.

### 5.1.3.7 Annual reduction of energy costs

According to Statistics Austria<sup>27</sup>, the prices including taxes for electricity in 2022 were 0.225 EUR/kWh and for natural gas including taxes 0.080 EUR/kWh. According to Eurostat data (2019), in Austria around 5% of energy used for heating derives from electricity and approximately 27% from natural gas<sup>28</sup>. Since in the EU in 2019 63.6% of energy consumed from households was for space heating whereas only 0.4% was used for space cooling, the latter will not be considered in the following calculations. As previously mentioned, 33% of factsheets were related to electricity consumption and 66.6% to space heating and cooling. Hence, it can be concluded that of the 19.11 GWh previously calculated as energy savings, one third was due to electricity savings, whereas two thirds were due to space heating and cooling savings. Therefore, we can multiply 1/3 of the savings times the electricity price, resulting in savings of:  $19.11 \text{ GWh} \times \frac{1}{3} \times 0.225 \text{ EUR/kWh} \times 1,000,000$  (unit conversion from GWh to kWh) = **1.43 million EUR**. Additionally, of the remaining two thirds (12.74 GWh), 5% were consumed by electricity (0.637 GWh) and 27% by gas (3.44 GWh). Therefore, if we multiply these two values by the electricity and gas prices respectively, we obtain:  $0.637 \text{ GWh} \times 0.225 \text{ EUR/kWh} \times 1,000,000$  (unit conversion) = **143,325 EUR** and  $3.44 \text{ GWh} \times 0.080 \text{ EUR/kWh} \times 1,000,000$  (unit conversion) = **275,200 EUR**. Hence, by summing the three economic values, we can determine that a total of 1.849 million EUR (or **616,333 EUR/year**) were saved during the ENPOR project.

### 5.1.3.8 Reduction of greenhouse gas emissions

To calculate the emissions saved, an emission factor of 0.160 kg/kWh for electricity was considered based on data from the Austrian Federal Environment Agency for the Austrian power plant fleet<sup>29</sup>. For the emissions saved through reduced heat consumption, the heating mix of Austria was considered, and an average value of 0.195 kg/kWh was obtained. Hence, in total, this results in savings of **3,682 tonnes** of CO<sub>2</sub> equivalents for Austria per year.

### 5.1.3.9 Investments in energy retrofits triggered by the project

No activities related to investments in energy retrofits were conducted in Austria.

### 5.1.3.10 Contributions to energy efficiency policy development and to best practice development on energy poverty and/or small-scale renewable energy investments to be sustained beyond the period of EU support

The ENPOR project was able to support a new training format for energy advisors and the co-creation of a coordination office for energy poverty in Austria. These initiatives were designed to be effective over the long term and are particularly well-suited for sustained impact. As a result, the ENPOR project has achieved significant and relevant policy influence in this area.

The materials developed during ENPOR will be used in consultation beyond the project period and will remain as a long-term instrument. Our input for the Ministry of Climate Action in policy development also had a long-term effect, as we were able to provide input in the preparation of the Energy Poverty Coordination Office, which will currently exist by law until 2030 in any case and will implement various activities.

<sup>27</sup> <https://www.statistik.at/statistiken/energie-und-umwelt/energie/energiepreise-steuern>

<sup>28</sup> [https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Energy\\_consumption\\_in\\_households#Energy\\_consumption\\_in\\_households\\_by\\_type\\_of\\_end-use](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Energy_consumption_in_households#Energy_consumption_in_households_by_type_of_end-use)

<sup>29</sup> <https://secure.umweltbundesamt.at/co2mon/co2mon.html>

#### **5.1.3.11 Number of influenced documents**

In the wake of the ENPOR project, the Austrian Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology, in collaboration with the Austrian Energy Agency, has successfully implemented new strategies to support energy-poor households in Austria. These strategies include the development of targeted information materials and the introduction of a specialized training format for Social Energy Advice, aimed at providing comprehensive support and advice to those most affected at the national level. Finally, the Energy Poverty Coordination Office was enshrined in the Federal Energy Efficiency Act in 2023<sup>30</sup>.

#### **5.1.3.12 Number of households and or consumers impacted by the policy**

As mentioned in Section 5.1.3.6, about **130,000** pieces of new counselling and information materials have been ordered by counselling organisations during the ENPOR project, both from the social and energy sectors. Since these materials were used directly in advising households and not just distributed to them, it can be assumed that every household that received the piece of new counselling and information material was impacted by the policy.

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<sup>30</sup> <https://www.ris.bka.gv.at/GeltendeFassung.wxe?Abfrage=Bundesnormen&Gesetzesnummer=20008914>

## 5.2 Monitoring methodology in Croatia

### 5.2.1 Description of the measure/policy, adaptation through the REACT groups, and comparison to the baseline scenario

#### 5.2.1.1 The National Programme for Renovation of Buildings

The **National Programme for Renovation of Buildings for the period 2014-2020** aimed to undertake renovation activities, ensuring that part of benefitting households were those experiencing energy poverty. The program is implemented through four programs, but our focus was on the following two:

1. **“Programme of energy renovation of family houses 2014-2020”**: In 2020 there was an amendment to the program (*Public call for citizens at risk of energy poverty to finance the energy renovation of family houses for vulnerable groups*) where 20% of the total funds (28.4 million HRK = 3.79 million EUR) were set aside for vulnerable groups of citizens who got 100% subsidy.
2. **“Programme of energy renovation of multi-apartment buildings for the period 2014-2020”**: The programme is planned to continue according to the **National Programme for Renovation of Buildings for the period 2021-2027** and is implemented through several programmes, although our focus was on:
  - a) Energy renovation programme for multi-apartment buildings;
  - b) Energy renovation programme for single family houses – as part of this programme, there will be a programme for energy renovation of family houses for vulnerable groups of citizens from 2021-2027.

A brief explanation on how each measure/policy was adapted through the REACT groups is described below:

For the **first REACT group**, the focus of the meeting was on the “Public Call for citizens at risk of energy poverty for energy renovation of family houses for vulnerable groups of citizens at risk of energy poverty”, which began in 2020 and only included citizens already targeted by the welfare system and excluded other categories of vulnerable groups of citizens and citizens at risk of energy poverty. The intention was to develop better criteria for the next Public Call, while improvements in criteria to this policy were discussed. This does not mean that these measures did not help in alleviation of energy poverty in the PRS. On the contrary, by creating measures to improve the Energy renovation programme for multi-apartment buildings, the application of landlords on Public Call for energy renovation could be encouraged even more and thus contributed to alleviating energy poverty of tenants in the PRS.

The integration of specific measures and criteria related to the PRS remained an open question for the next meetings. Conclusions from the meeting delineated that:

- The problems included the lack of definition of *energy poverty* on the national level and the lack of criteria on energy poverty on national level.
- The implementation of financing measures within energy renovation programmes for multi-apartment buildings to support both landlords and tenants were critical for the conformation of energy poverty in the PRS.
- The integration of specific measures and criteria were to be considered as option to alleviate energy poverty in the PRS.

The **first TARGET group** involved more discussion of the positive and negative sides of the

Programme as well as Public Calls within the Programme from the point of view of applicants and beneficiaries of the latter. The area of Buševac is quite small and as such, the classic PRS does not exist. Due to unresolved property-legal relations there is the presence of so-called free-based tenancy, which always includes two separate families/households in the same dwelling and extended families living in a joint household.

As part of the *BušEko?* Project<sup>31</sup>, an energy poverty survey was conducted in Buševac (150 completed questionnaires) by DOOR and OSS Buševac and detailed data on energy poverty, energy consumption and PRS were gathered. As in other suburban areas, extended families who are living in a joint household were present in Buševac as well, thus it is difficult to determine the real PRS situation.

The conclusions of the first TARGET group meeting included that:

- There is an interest in the Programme and Public Calls, but most citizens were concerned about complicated administrative paperwork and application processes.
- More systematic education about energy poverty and alleviating energy poverty in PRS for citizens should be conducted.
- After the analysis of the survey, the obtained data could be used for further action on the alleviation of energy poverty in the area of Buševac.

During the **second REACT group meeting** discussion, different problems were identified in the urban and rural part of the city of Križevci. In the urban part, an unregulated market and unresolved property-legal relations contributed to the problem of lack of national data and the market operating in the shadow zone. In the suburban and rural parts of the city of Križevci, the classic PRS also does not exist and is replaced by free-based tenancy, which always includes two separate families/households in the same building creating a situation where extended families live in a joint household, while in some cases three generations and their relatives inhabit the same space as well.

As part of the POWERPOOR project<sup>32</sup>, an energy poverty survey was conducted in Križevci (where 275 households were visited) by DOOR and detailed data on the situation regarding energy poverty for the area were obtained. Among other indicators, energy poverty indicators for the PRS were included in the survey, then gathered and analysed.

The conclusions of the second TARGET group meeting were the same as for the first, but in relation to the area of Križevci.

During the **third REACT group** discussion, different problems were identified in the urban and rural part of the city of Zadar and Zadar county. In the urban part, an unregulated market, unresolved property-legal relations and postponing complete renovation of buildings and passing the problem on to future heirs contributed to the problem of lack of national data and the market operating in the shadow zone. In the suburban and rural parts of the city and county, during the post-war reconstruction, most citizens gave up on the complete renovation of their house at the expense of the construction of additions to structures to increase their square footage, and nowadays following post-war reconstruction, the houses still have no façade, thermal insulation or complete infrastructure such as sewerage, water supply and access to electricity. As such, the classic PRS also does not exist here.

As part of the EmpowerMed project<sup>33</sup> an energy poverty survey was conducted in the area of the city

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<sup>31</sup> <https://door.hr/portfolio/bus-eko/>

<sup>32</sup> <https://powerpoor.eu/>

<sup>33</sup> <https://www.empowermed.eu/>

of Zadar and Zadar County, where 200 direct households were visited by DOOR in cooperation with Red Cross – Zadar and detailed data on the situation regarding energy poverty for the area was obtained. Specific to the ENPOR project is that one important question is included in the survey, namely the question of property ownership (i.e. whether they live in their own property or in a rented one).

Conclusions of the third REACT group meeting included that:

- There was interest in the Programme and Public calls, but most citizens were concerned about the complexity of administrative paperwork and the application process.
- More systematic education about energy poverty and alleviation in the PRS for citizens should be conducted.
- After the analysis of the survey, the obtained data was used for further action on the alleviation of energy poverty in the area of Zadar.

The **National Programme for Renovation of Buildings for the period 2014-2020** envisioned four Public Calls for energy renovation. Of these, three were Public Calls for energy renovation in the sector of family houses and only one Public Call for the sector of multi-apartment buildings. Of the three Public Calls for energy renovation in the sector of family houses, only one was for energy poverty, namely the Public Call for citizens at risk of energy poverty to finance the energy renovation of family houses of vulnerable citizens at risk of energy poverty - which was published in 2020. The Public Calls which contributed to some uncertainties and reluctance about the funding among the beneficiaries were open in 2015 and 2020 and are shown in the table below.

**Table 10: Croatia's baseline for policy**

Year	Type of program	Type of Call	Number of households	Grant	Primary energy savings (GWh/year)	Reduction of greenhouse gases emissions (in tCO <sub>2</sub> - eq/year)
2015	Programme of energy renovation of <b>family houses</b> 2014 – 2020	Public Call for all citizens	9200*	N/D	194,48 GWh***	28.591,66 tCO <sub>2</sub> ***
2015	Programme of energy renovation of <b>multi-apartment buildings</b> for the period 2014 – 2020	Public Call for all citizens	Data are not available separately but in the same batch as for family households	Data are not available separately but in the same batch as for family households	Data are not available separately but in the same batch as for family households	Data are not available separately but in the same batch as for family households
2020	Programme of energy renovation of <b>family houses</b> 2014 – 2020	Public Call for all citizens	3100**	210.900.000,00 HRK (~27.750.000,00 EUR)	9,51***	3.141,89 tCO <sub>2</sub> ***
2020	Programme of energy renovation of <b>family houses</b> 2014 – 2020	Public call for citizens at <b>risk of energy poverty</b> to finance the energy renovation of family houses for vulnerable citizens at risk of energy poverty	N/D	32.000.000,00 HRK (~4.210.500,00 EUR)	1,75***	

\* over 12,000 applications were received from citizens, and co-financing was approved for over 9,200 projects

\*\* over 7394 applications were received from citizens, and co-financing was approved for over 3100 projects

\*\*\*The savings were determined and verified in accordance with the Ordinance on the system of monitoring, measuring and verifying energy savings (OG 71/15).



The new Programme for energy renovation of family households, which will cover the period from 2021 to 2030 in accordance with the Long-Term Strategy for the Renovation of the National Building stock until 2050, obliges the Republic of Croatia to gradually raise the current annual rate of renovation of the total floor area of buildings from 0.7% to 3% per year. These goals required the provision of additional funding to co-finance energy renovation projects for buildings.

Financial resources for the implementation of this Programme in the total amount of HRK 400 million (~52,630,000 EUR) were 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 were ensured for the 2021 and 2022 period but not for 2023. The Fund predicted that HRK 121 million (~15,921,000 EUR) could be secured by the distribution of surplus revenue in 2021 and could be probably allocated to 2023 and thus the total amount of HRK 400 million (~52,630,000 EUR) for the period 2021-2023 could be achieved as it shown in table below.

It should also be emphasized that the criteria of damage of the house in the earthquake was considered when allocating funds of HRK 400 million (~52,630,000 EUR):

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

The table shows the tender opening process for the period 2021, 2022 and 2023. It can be seen that part of the funds intended for the energy renovation of the houses damaged in the earthquake was transferred to the installation of photovoltaics. One of the possible reasons is that only 399 buildings in the amount of 7.7 million euros applied for energy renovation of houses damaged in the earthquake, while there is a waiting list of 3,250 submitted requests for installing photovoltaic panels.

**Table 11: Croatia's plan of implementation of policy during ENPOR project (2020-2023)**

Year	Type of program	Type of Call	Number of households	Grant	Primary energy savings (GWh/year)	Reduction of greenhouse gases emissions (in tCO <sub>2</sub> -eq/year)
2021	Programme of energy renovation of <b>family houses*</b>	Public Call for all citizens	TBD	185.000.000,00 HRK (~24.345.000,00 EUR)	N/D	N/D
2021	Program to combat energy poverty, which includes the use of renewable energy sources in residential buildings in subsidized areas and areas of special state care for the period until 2025.	open call – pre-mapped 387 buildings in special state care	7 buildings	N/A	N/A	N/A
2022	Programme of energy renovation of <b>family houses**</b>	Public Call for energy renovation for houses	399	50.000.000,00 HRK (~6.580.000,00 EUR)	N/D	N/D

2022	Programme of energy renovation of multiapartment buildings for the period 2021 –2030	damaged in the earthquake Public Call for all citizens	N/A	N/A	N/A	N/A
2023	Programme of energy renovation of <b>family houses</b>	On going - Public call for PV system on family houses	Around 3250	~7,700.000,00 EUR	N/D	N/D

\*The public call will be a combined Public Call of two programmes in the amount of HRK 209 million (~28 million EUR) of which **HRK 185 million (~24 million EUR) on activities K200035 Family house renovation** programme and **HRK 24 million (~3,15 million EUR) on activities K2000027 Encouraging the use of renewable energy sources**

\*\*The public call will be a combined one of two programmes of the amount of HRK 70 million (~9,2 million EUR) of which **HRK 50 million (~6,6 million EUR) on activities K200035 Family house renovation** program and **HRK 20 million (~2,63 million EUR) on activities K2000027 Encouraging the use of renewable energy sources**

During the ENPOR project, DOOR kept track of:

- **Dynamics of publishing public calls;**
- **Type of programme:** Programme of energy renovation of family houses or Programme of energy renovation of multi-apartment buildings;
- **Type of calls:** public calls for all households or public calls for energy-poor households (with emphasis on particularly vulnerable groups as tenants in the PRS or for so-called free- based tenancy, which always includes two separate families/households in the same dwelling and extended families living in a joint household);
- **Funds allocated for the call;**
- **Number of households with signed contracts under the call;**
- **Primary energy savings (GWh/year);**
- **Reduction of greenhouse gases emissions (in tCO<sub>2</sub>- eq/year).**

DOOR wrote a report on the results of the National Programme for the Renovation of Buildings for the period 2014-2020 and a report for the National Programme for Renovation of Buildings for the period 2021-2027 with special attention to the period 2021-2023 which covered the ENPOR project as it shown in table below. The reports show both the results of the 2014-2020 period programme and expectations from 2021-2027 programme, trying to make a comparison between the expectations in both programmes and actual results for the 2014-2020 period.

**Table 12: National Programme for Renovation of Buildings for the period 2014-2020 and National Programme for Renovation of Buildings for the period 2021-2027 with special attention to the period 2021-2023 which covered the ENPOR project**

Indicators		National Programme for Renovation of Buildings for the period 2014-2020	National Programme for Renovation of Buildings for the period 2021-2027 (with ENPOR period being 2021-2023)
Dynamics of publishing public calls	2014	No	
	2015	Yes	
	2016	No	
	2017	No	
	2018	Yes (only for RES, no EE)	

	2019	Yes (only for RES, no EE)	
	2020	Yes	
	2021	Yes	Monitoring in progress
	2022	Yes	Monitoring in progress
	2023	Yes (only for RES, no EE)	Monitoring in progress
	2024		
	2025		
	2026		
	2027		
<b>Type of program</b>	Programme of energy renovation of family houses 2014 – 2020	4	Monitoring in progress
	Programme of energy renovation of multi-apartment buildings 2014-2020	4	Monitoring in progress
	Programme of energy renovation of family houses 2014 – 2020 – extension for 2021-2023	2	Monitoring in progress
	Programme of energy renovation of multi-apartment buildings 2021-2027	1	Monitoring in progress
	Program to combat energy poverty, which includes the use of renewable energy sources in residential buildings in subsidized areas and areas of special state care for the period until 2025.	No public calls- mapped 387	Monitoring in progress
<b>Type of Calls</b>	Public calls for all households 2014-2020	3	Monitoring in progress
	Public calls for energy-poor households 2014-2020	1	Monitoring in progress
	Public call for houses damaged in the earthquake in 2022	1	Monitoring in progress
<b>Amount of funds</b>		N/D	400.000.000,00 HRK (~52,630.000,00 EUR)
<b>Number of households covered by the Call</b>		762 397	Monitoring in progress
<b>Primary energy savings (GWh/year)</b>		N/D	56 GWh
<b>Reduction of greenhouse gases emissions (in tCO<sub>2</sub>-eq/year)</b>		N/D	14.500,00 tCO <sub>2</sub>

### 5.2.2 Data collection and monitoring methods

The Ministry of Physical Planning, Construction and State Property, and the Environmental Protection and Energy Efficiency Fund oversee the implementation of these programmes and are obliged to report on the success of the Programme and to present it to the public. Data collected were primary energy savings (GWh/year), investments in energy retrofit (million EUR), number of influenced

documents (statements from policy makers or national policy legislative documents), number of households impacted by the policy and reduction of greenhouse gases emissions (in tCO<sub>2</sub>- eq/year) by monitoring and analysing published reports and DOOR internal reports with comments on legislative framework and strategic documents.

In addition, indicators such as a consensual-based indicator (ability to keep home adequately warm/cold), arrears on utility bills, faulty housing, expenditure-based indicators (lihc/hac), and energy prices were used within a national survey developed by DOOR which included data on energy poverty in the PRS as well along with broader set of national data on energy poverty.

Data collection occurred through the research of published data by the authorities responsible for the implementation of the Programme, namely: the Ministry of Physical Planning, Construction and State Property, and the Environmental Protection and Energy Efficiency Fund.

Data collection through a small-scale survey about property ownership supported in getting information about the classic PRS. By carefully designing questions, we could obtain more accurate data about the free- based tenancy or hidden tenancy as well.

Engagement through REACT group and TARGET group of already identified stakeholders in **D4.6 Update of National Stakeholder Engagement Strategies** occurred such as with landlords/co-owners' associations, charitable and social work associations, energy consultants, policymakers, citizens groups / NGOs, utilities and energy poor households. REACT group and TARGET group were organized through various forms of events such as meetings, info days, workshops, round tables and so on. By involving all stakeholders, we envisioned the period of implementation of the Program 2021-2023 to be more successful than the period of the Programme 2014-2020 in the number and dynamics of opening public calls, in the number of the types of programme, in number of type of Calls, amount of funds, number of households covered by the Call, primary energy savings (GWh/year) and reduction of greenhouse gases emissions (in tCO<sub>2</sub>- eq/year).

**Table 13: Croatia's data collection methods**

Project Performance Indicator	Method(s) for data collection	Data Source
Primary energy savings (GWh/year)	Official reports of the Fund and Ministry	<a href="https://www.fzoeu.hr/">https://www.fzoeu.hr/</a> <a href="https://mpgi.gov.hr/">https://mpgi.gov.hr/</a>
Investments in energy retrofit (million EUR)	Official reports of the Fund and Ministry	<a href="https://www.fzoeu.hr/">https://www.fzoeu.hr/</a> <a href="https://mpgi.gov.hr/">https://mpgi.gov.hr</a>
Number of influenced documents - Statements from policy makers or national policy legislative documents	DOOR internal reports	DOOR internal reports with comments on legislative framework
Number of households impacted by the policy	Official reports of the Fund and Ministry	<a href="https://www.fzoeu.hr/">https://www.fzoeu.hr/</a> <a href="https://mpgi.gov.hr/">https://mpgi.gov.hr</a>
Reduction of greenhouse gases emissions (in tCO <sub>2</sub> - eq/year)	Official reports of the Fund and Ministry	<a href="https://www.fzoeu.hr/">https://www.fzoeu.hr/</a> <a href="https://mpgi.gov.hr/">https://mpgi.gov.hr</a>
Consensual-based indicator (ability to keep home adequately warm/cold)	National based survey	DOOR – developed survey
Arrears on utility bills	National based survey	DOOR – developed survey
Faulty housing	National based survey	DOOR – developed survey
Expenditure-based indicators (lihc/hac)	National based survey	DOOR – developed survey
Energy prices	National based survey	DOOR – developed survey

## 5.2.3 Policy and Project Impacts

### 5.2.3.1 Number and type of stakeholders

**Table 14: Croatia's REACT and Target group stakeholder composition**

	Number of meetings	Landlords	Co-owners' associations	Tenants	Charitable and social work associations	Energy Agency / Energy consultants	Local policymakers	Regional policymakers	National policymakers	Utilities	Citizens groups / NGOs	Other (specify)
REACT	13	0	5	0	5	10	10	0	48	11	52	4 (academia) 2 (SME) 5 (private companies) 1 (newspaper)
TARGET	6	0	0	0	0	0	2	1	0	0	21	1 (HGK Croatian Chamber of Commerce) 186 (citizens) 8 (other)

### 5.2.3.2 Gender of participants in REACT groups

**Table 15: Croatia's REACT and Target group gender composition**

	Male	Female	Ratio
REACT (153 total)	52	100	0.5:1 and therefore ~1:2
TARGET (219 total)	94	125	0.77:1 and therefore ~ 3:4

### 5.2.3.3 Number of decision makers used tool to inform policy or local decision making and/or number of experts used tool in workshop

In Croatia, 2 decision-makers utilised the tool, whereas the latter was presented to 15 decision-makers in total. Similarly, roughly 8 experts employed the tool in events (seminars, workshops, etc.) even though it was presented to more than 21 experts.

### 5.2.3.4 Discussions on replication of the policies

In Croatia, 1 case project at national level was carried out. The latter discussed the preparation of an amendment to the ETS Directive and the Regulation on the establishment of a social fund for climate policy by 2026. In the REACT group meetings with policy makers was discussed whether the use of DOOR's questionnaire, piloted in the city of Zagreb, was to be made at the national level. In fact, with the question of property ownership we would also get an insight into the PRS and their energy consumption, with a view on data regarding energy-poor citizens living in rented accommodations.

Of the 15 decision-makers that were present at the ENPOR project workshop, 10 answered that the collected data helped them to better understand and design policies for the national context. The decision makers were from the following municipalities/institutions: city of Zagreb, city of Križevci,

city of Zadar and municipality Buševac, Central State Office for Reconstruction and Housing, Ministry of Labour, Pension System, Family and Social Policy, Ministry of Economy and Sustainable Development, Ministry of Spatial Planning, Construction and State Property, the Environmental Protection and Energy Efficiency Fund, and the Agency for legal transactions and real estate brokerage.

### 5.2.3.5 Meeting expectations of REACT groups

The stakeholders that took part in the REACT group meetings were very satisfied, stating that the meeting did meet their expectations. Stakeholders were happy that other means of energy such as solar energy were mentioned as part of refurbishments and suggested meetings with a smaller number of stakeholders, so as to foster more intensive policy discussions.

### 5.2.3.6 Annual primary energy savings triggered by the project and 5 years after the project

During the ENPOR project, 1,715 households were contacted and affected by the Energy upgrade of buildings policy in Croatia.

It was assumed that in Croatia, the average household consumes 200 kWh/m<sup>2</sup> per year with an average flat size of 75 m<sup>2</sup> <sup>34</sup>. Hence, by multiplying the latter, it was found that **25.73 GWh/year** of primary energy saving were triggered by the ENPOR project in Croatia. Hence, during the three years of the project, a total of 77.19 GWh. This can also be expressed as **128.65 GWh** over a **5-year** span.

### 5.2.3.7 Annual reduction of energy costs

To find the annual reduction of energy costs, the energy prices for Croatia, together with the energy fuel share for households were considered. Namely, it was found that 21.33% of the household energy consumption came from gas, 22.95% from electricity, 46% from wood, 5% from district heating<sup>35</sup>. When multiplying these values by the previously calculated energy savings, the GWh/year saved per different fuel type can be found. Thereafter, these were multiplied by the respective energy prices, namely 0.117 EUR/kWh for electricity, 0.461 EUR/kWh for gas, 60 EUR/m<sup>3</sup> for wood<sup>36</sup>, and 0.1155 EUR/kWh for district heating. By doing so, it was found that 642,330 EUR of electricity were saved, 2,724,510 EUR of gas, 281,905 EUR of wood, and 148,995 EUR of district heating. Hence, in total, **3,797,740 EUR/year** of energy costs were saved.

### 5.2.3.8 Reduction of greenhouse gas emissions

Stemming from the energy savings triggered by the project, the reduction of GHG emissions was calculated. An emission factor for greenhouse gases of 345 g of CO<sub>2</sub> per kWh was considered, which multiplied by the energy savings results in **8,876.85 tonnes of CO<sub>2</sub>** per year.

### 5.2.3.9 Investments in energy retrofits triggered by the project

To calculate the investments in energy retrofits it was considered that the average price to retrofit a

<sup>34</sup><http://www.gskg.hr/UserDocImages/Energetska%20obnova/Energetska%20u%C4%8Dinkovitost%20zgrada/Program%20energetske%20obnove.pdf>

<sup>35</sup> [https://ec.europa.eu/eurostat/databrowser/view/t2020\\_rk210/default/table?lang=en](https://ec.europa.eu/eurostat/databrowser/view/t2020_rk210/default/table?lang=en)

<sup>36</sup> It is assumed that 1 m<sup>3</sup> of beech tree corresponds to 2,520 kWh  
(<https://www.arnsidesilverdaleaonb.org.uk/uploads/2016/04/BCCICfactsheet3.pdf>)

household in 2023 in Croatia was 20,000 EUR. This number was obtained from field data and calculations made by DOOR when monitoring the market for energy renovation. Hence, by multiplying the number of households (1,715) by the cost of retrofitting it (20,000 EUR), it was found that in total **34.3 million EUR** were triggered by the ENPOR project in Croatia.

#### **5.2.3.10 Contributions to energy efficiency policy development and to best practice development on energy poverty and/or small-scale renewable energy investments to be sustained beyond the period of EU support**

- Part of public consulting for the “Programme for energy renovation of multi-apartment buildings for the period up to 2030 - Decision (Official Gazette, No. 143/2021)” - DOOR sent a letter with comments on the program (statement)
- Part of public consulting for 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 (Decision (Official Gazette, No. 143/2021) - DOOR sent a letter with comments on the program (statement)
- A memorandum on energy poverty for the annual report was sent to the Ombudswoman, who submits the report to the Croatian Parliament for adoption - the report includes the problem of energy poverty in PRS - (ENPOR is not specifically mentioned, but it is mentioned in the DOOR statement that the Ombudswoman used to prepare her report)
- Best practices were:
  - For the 4 pilot cities/municipalities (city of Zagreb, city of Križevci, city of Zadar and municipality Buševac) a survey was implemented in cooperation with sister projects to collect data about energy consumption in the PRS (with a vision of data on energy poverty in the PRS) for the local authorities to tailor measures to their local circumstances:
    - As part of the BušEko project an energy survey was conducted in the area of Buševac with up to 152 completed surveys by DOOR and OSS Buševac and detailed data on the situation regarding energy poverty for the area of Buševac was obtained.
    - As part of the POWERPOOR project using the POWERPOOR toolkit, an energy poverty survey was conducted in the area of Križevci with
      - direct households will to be visited.
    - As part of the EmpowerMed project, an energy poverty survey was conducted in the city of Zadar and Zadar County with 200 households surveyed by DOOR in cooperation with the Red Cross – Zadar and detailed data on the situation regarding energy poverty for the area of Zadar and Zadar County were obtained.
    - As part of the EPAH technical assistance for municipalities, an energy poverty survey was conducted in the city of Zagreb with 388 households surveyed by DOOR
  - As part of EmpowerMed an objective of visiting 70% of households with women who are owners or are responsible for paying energy bills was set. Due to the EmpowerMed project, within the ENPOR analysis for the city of Zadar, the gender dimension was included in the collected data.
  - The cooperation with the Red Cross in the city of Križevci proved to be the most successful approach for household visits. Organisations such as the Red Cross already have had some projects in which they worked directly with vulnerable beneficiaries; hence they were able to help in reaching out to the energy poor. They were also seen as more successful in reaching out since they had developed

trust with the citizens.

An amendment to the ETS Directive will be enacted by 2026 and the Regulation on the establishment of a social fund for climate policies will be passed by 2026.

#### **5.2.3.11 Number of influenced documents**

Three statements were submitted: two to the Ministry of Spatial Planning, Construction and State Property and one to Office of the ombudswoman.

#### **5.2.3.12 Number of households and or consumers impacted by the policy**

As mentioned in Section 5.2.3.6, during the ENPOR project **1,715** households were contacted and affected by the energy upgrade of buildings policy in Croatia and energy sectors.



## 5.3 Monitoring methodology in Estonia

### 5.3.1 Description of each measure/policy, adaptation through the REACT groups, and comparison to the baseline scenario

#### 5.3.1.1 National Retrofitting Grant

The Estonian national retrofitting grant was established in 2010 as a public initiative under the Estonian financial institution, KredEx, that became a grant holder. It was established as a temporary measure for supporting the market uptake of the liberal retrofitting economy of a fully privatized Estonian housing market. During the initial support period, the instrument was proven to be successful resulting in its prolongation in 2014. In 2019, adjustments relating to its focus and function were made, after which it was prolonged for a second time. Within the first 10 years of its operation, the grant helped to renovate 1,114 buildings that reduced CO<sub>2</sub> emissions by 140,000 tons and has been a good example as a public initiative at an EU level. At the same time, this grant has important shortcomings that should (and partially have been) addressed for being a well-balanced public policy.

The following measures were developed as an outcome of the co-creation process with the REACT groups:

- 1) **Measure 1.** Emphasizing the importance of renovation capacity in regulations and legislation, including:
  - 1.1. Emphasizing the renovation capacity and the opportunities for its development, which would open new opportunities to increase the renovation of apartment buildings. Renovation capacity itself should be a priority, instead of repairing one roof or façade to improve the whole building.
  - 1.2. Boosting the full renovation of historic buildings.
  
- 2) **Measure 2.** Increasing the capacity of parties participating in the renovation process, including:
  - 2.1. Increasing the role of tenants in the apartment building renovation process and including them in the decision-making process together with the owner of the rented apartment (or as its representative).
  - 2.2. Providing renovation information for non-native speakers.
  - 2.3. Establishing a dedicated energy agency for supporting the renovation of the apartment buildings and other energy transition activities in the main non-Estonian speaking region Ida-Virumaa. The Tartu Regional Energy agency can be used as an example.
  - 2.3. Promoting the wider use of digital tools in the housing association participation process to overcome the bottlenecks in these processes.
  
- 3) **Measure 3.** Increasing renovation capacity with the help of national renovation grant, including:
  - 3.1. Financing for the state renovation grant for at least 10 years.
  - 3.2. Allowing the related salary of an appointed board member of a building association to be covered by the national renovation grant.
  - 3.3. Increasing the inclusion of energy poverty target groups into the national renovation grant and evaluate the impact of the national renovation grant to energy poverty.
  - 3.4. Supporting only the full renovation of apartment buildings using the national renovation grant and creating additional measures for supporting the building associations lacking the renovation capacity in the process of full renovation.

- 3.5. Supporting the cluster renovation, with the necessary simplifications for joint procurement and measures to improve the capacity of associations.
  - 3.6. Supporting the district-wide multi-building renovation, together with the simplifications needed for joint procurement, measures to improve the capacity of associations and support measures for improving the area between buildings.
  - 3.7. Supporting the foundation-wide multi-building renovation, together with the simplifications needed for joint procurement, measures to improve the capacity of associations and support measures for improving the area between buildings.
- 4) **Measure 4.** Increasing renovation capacity in the City of Tartu by:
- 4.1. Developing major district-based renovation projects in Tartu, that will create conditions for the development and implementation of a renovation plan covering the entire district (or another urban spatial unit).
  - 4.2. Applying for the European ELENA grant to support district-based renovation in the district of Annelinn.
  - 4.3. Establishing a full package renovation consulting service in Tartu (a “one-stop-shop”).
  - 4.4. Setting up community agreements with organizations and associations that contribute to increasing the volume of full renovation of apartment buildings. The Community Agreement is an exciting engagement initiative started by the City of Tartu, which calls on organizations operating in the city to support the city's sustainable goals.
  - 4.5. Initiating a dialogue between tenants, real estate companies and universities in the City of Tartu to map the problems of the PRS market and prevent their negative impact.

The national renovation grant has been identified by legislators as one of the policies for reducing energy poverty. However, we saw that the implementation of the grant did not address energy poverty directly nor did it take into the consideration some of the more specific problems of energy poverty that households face - including hidden energy poverty in the PRS. To reduce the living costs and improve the life quality of the target group, TREA evaluated, improved and monitored the national reconstruction grant used for the deep refurbishment of the PRS. Consequently, TREA enhanced the capacity of policy makers for understanding the negative effects of energy poverty and address these in a more direct manner. As a result, the national refurbishment policy will be more usable for improving the conditions of energy poor households. Policy recommendations for the national legislation emerged from the work of the REACT group, touching upon social, financial - low real-estate value, demographics, geographical, infrastructural and other aspects. The improvements were discussed with the policy makers (Estonian Ministry of Economic Affairs and Communication) and tested in the City of Tartu during the ENPOR project. TREA supported the associations of tenants and landlords throughout the refurbishment by providing technical expertise, negotiating with service providers, monitoring consumption, educating tenants on everyday energy saving measures, etc.

### 5.3.2 Data collection and monitoring methods

Data was collected at the national level yearly from the national grant holder concerning the number of households influenced by the renovation programme. REACT group meetings provided a platform for analysing and evaluating the progress of the policy improvements and are to be reported back to the ENPOR project team. The energy efficiency and greenhouse gas emission indicators were developed using the data from the grant holder and analysed by the experts of TREA. Additional analysis was performed as an outcome of regular policy monitoring using the national online platform. The monitoring targeted the implementation of the concept of energy poverty in renovation policy and other related areas. Representations of energy poverty in policy documents emphasized the wider importance of the topic.

**Table 16: Estonia's data collection methods**

Project Performance Indicator	Method(s) for data collection	Data Source
Primary energy savings (GWh/year)	Data inquiry	National statistics
Investments in energy retrofit (million EUR)	Data inquiry	National statistics
Number of influenced documents - Statements from policy makers or national policy legislative documents	Policy analysis	National legislation database
Number of households impacted by the policy	Data inquiry	National statistics
Reduction of greenhouse gases emissions (in tCO <sub>2</sub> - eq/year)	Emission analysis	National statistics
Number of energy poverty indicators used for grant applications	Data inquiry	National statistics

### 5.3.3 Policy and Project Impacts

#### 5.3.3.1 Number and type of stakeholders

**Table 17: Estonia's REACT and Target group stakeholder composition**

	Number of meetings	Landlords	Co-owners' associations	Tenants	Charitable and social work associations	Energy Agency / Energy consultants	Local policymakers	Regional policymakers	National policymakers	Utilities	Citizens groups / NGOs	Other (specify)
REACT	5	0	8	0	0	27	14	1	16	12	1	1 (journalist) 6 (other)
TARGET	1	0	0	0	2	7	1	0	0	0	0	1 (academia) 5 (housing associations)

#### 5.3.3.2 Gender of participants in REACT groups

**Table 18: Estonia's REACT and Target group gender composition**

	Male	Female	Ratio
REACT	62	24	2.58:1 therefore ~5:2
TARGET	5	11	1:2.2 therefore 5:11

#### 5.3.3.3 Number of decision makers used tool to inform policy or local decision making and/or number of experts used tool in workshop

The Energy Poverty Dashboard (EPD) was introduced to 8 policy makers working both at the local and national level.

#### 5.3.3.4 Discussions on replication of the policies

In the last REACT group meeting, 8 policymakers were surveyed, and it was found that all of them

answered that it was necessary to continue the work with policies to mitigate energy poverty.

#### 5.3.3.5 Meeting expectations of REACT groups

The stakeholders involved in the REACT group meeting expressed through a survey that they were satisfied with the meeting and that their expectations had been met.

#### 5.3.3.6 Annual primary energy savings triggered by the project and 5 years after the project

The ENPOR project focused on the national reconstruction grant specifically for the city of Tartu. The latter has 5,000 households in total. Of these, 210 were affected by the ENPOR policy (roughly 4% of households) and they were spread over a total of 7 buildings.

By renovating the average household in Estonia, it was assumed that 3.9 MWh per year would be saved<sup>37</sup>. Hence, by multiplying the latter by the number of affected households, it was found that **0.82 GWh/year** of primary energy saving were triggered by the ENPOR project in the city of Tartu. This results in a total of 2.46 GWh over a three-year period. This means that in the **5 years** following the end of the ENPOR project, **4.1 GWh** of energy could be saved.

#### 5.3.3.7 Annual reduction of energy costs

The reduction in energy costs can be obtained by multiplying the energy savings triggered by the project times the price of district heating in 2023. In so doing, we get that: 0.82 GWh/year (energy savings) \* 92 EUR/MWh (district heating price in Estonia)\* 1,000 (unit adjustment)/ 1,000,000 (unit adjustment) = **0.075 million EUR/year** of energy costs were saved in Tartu.

#### 5.3.3.8 Reduction of greenhouse gas emissions

As previously mentioned, 7 buildings in the city of Tartu were considered in Estonia. One such building utilises on average 30 tonnes of CO<sub>2</sub>-eq/year for energy usage (both district heating and electricity). By fully renovating such buildings, a 63% reduction in CO<sub>2</sub> emissions from energy usage would be possible. Thus, by multiplying the latter, it was found that thanks to the ENPOR renovation policies, a total of **132.3 tonnes of CO<sub>2</sub>-eq./year** were saved in the city of Tartu.

#### 5.3.3.9 Investments in energy retrofits triggered by the project

In Estonia, the average energy renovation price is 1000 EUR/m<sup>2</sup>. Considering that 7 buildings of 1,700 m<sup>2</sup> of living surface were considered (for a total of 11,900 m<sup>2</sup>), this would result in a total of **11,900,000 EUR** of investments triggered by the ENPOR project in the city of Tartu.

#### 5.3.3.10 Contributions to energy efficiency policy development and to best practice development on energy poverty and/or small-scale renewable energy investments to be sustained beyond the period of EU support

The ENPOR project contributed to a series of new proposals being made in Estonia with regards to the national renovation grant. The developed recommendations that resulted from the REACT group meetings were presented in November 2022. These included emphasizing the importance of

<sup>37</sup> Based on calculations from outcomes of previous renovations using the national renovation grant, published by grant holder KredEx in 2014.

renovation capacity for tenants in regulations and legislation; increasing the capacity of the parties for participating in the renovation process; increasing the renovation capacity with the help of the national renovation grant; and increasing the renovation capacity in the city of Tartu.

The Estonian national renovation grant for building renovation has been in place since 2010<sup>38</sup>. Estonia received funding until 2027 which will thus be sustained beyond the duration of the project.

#### **5.3.3.11 Number of influenced documents**

The ENPOR project in Estonia tackled only one policy which was the national renovation grant for buildings; thus, only one national document was influenced by the project.

#### **5.3.3.12 Number of households and or consumers impacted by the policy**

As mentioned in Section 5.3.3.6, during the ENPOR project 4.2% of households in the city of Tartu were affected by the energy upgrade of buildings policy, corresponding to 210 households spread across 7 buildings.

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<sup>38</sup> <https://kredex.ee/en/kodudkorda>

## 5.4 Monitoring methodology in Germany

### 5.4.1 Description of the measure/policy, adaptation through the REACT groups, and comparison to the baseline scenario

#### 5.4.1.1 Heating related energy advice

While there is no Federal programme to tackle energy poverty, the German Government financially supports non-state actors to provide energy saving advice to low-income households. The most prominent way is through the “Electricity Saving Check” administered by Caritas, in which long-term unemployed people are trained to provide energy saving advice and low-cost technical devices free of charge to welfare recipients and low-income households. As the heating expenditure of welfare recipients is covered by the State, the project mostly focused on electricity savings, but it has also started to extend its activities to heating related advice in some locations. The aim of ENPOR was to further develop the existing approach of heating related energy advice to increase heat savings and comfort levels and to broaden the evidence base of what works. To this end, innovative approaches to more effectively convey energy advice or achieve savings by means of low-cost technical measures were developed, tested and evaluated. A particular challenge here was the lack of immediate financial incentives for most consulted households (90%) due to State coverage of heating costs. Accordingly, measures need to target intrinsic motivations and/or focus on comfort or health improvements related to avoidance of draught or mould.

The co-creation in the REACT Groups helped to identify novel approaches to:

- a) improve the data base to better identify saving potentials and
- b) monitor impacts of the heating advice and increase its effectiveness.

As a result, a 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 immediate low-tech aids (e.g., sealing strip, draught excluders) was amended by a shower hourglass for households to better monitor their hot water consumption. It was expected that by these measures, target groups who carry little interest, background knowledge for the heating topic or have difficulties to grasp the issue, can gain a better understanding and will be motivated by illustrations, pictograms, reminders and gamification to change and adapt their behaviours and establish energy-efficient routines. It may also serve the purpose of making it easier to overcome language related hurdles.

Regarding the achievement of additional heating energy savings, the definition of a methodologically sound baseline was challenging due to a lack of sufficient data on factors possibly influencing heating consumption over time (e.g., outdoor climate, changes in household composition, replacement of existing heating systems etc). Furthermore, many households in the first visit lacked heating bills which could serve as a source for building a baseline. As a rough proxy, estimated savings from the previous years of the non-adapted heating advice were used. With regards to the number of households receiving heating advice, figures prior to the introduction of a more standardised address of the subject were considered a baseline for monitoring the project impact. Lastly, regarding comfort levels and wellbeing, a baseline was constructed using responses on respective questions prior to the implementation of advised measures.

### 5.4.1.2 Prepaid metering app

EnergieRevolve is a subsidiary of Stadtwerke Düren, a municipal utility in the West-German state of North Rine Westphalia. Their customers are offered an innovative model of pre-paid 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, allowing to better control their electricity consumption and electricity bills. The app allows to track the customer's electricity consumption as this information is transmitted every 15 minutes. About 1,200 customers are currently using the app, not only in North Rine Westphalia, but also in other areas such as Berlin and Frankfurt, including a high proportion of low-income/energy poor households. Within ENPOR the app was further developed to provide additional utility to customers in terms of improving knowledge transfer about drivers and possible means to reduce unnecessary electricity consumption.

### 5.4.2 Data collection and monitoring methods

The monitoring of the developed heating advice approach took advantage of different data collection methods and data sources and was implemented in three steps. As a first step, in the second household visit (taking place a week after the first visit) advised households were asked about their experience with- and assessment of the provided information tools. The questions aimed to capture the impact of the tools in terms of knowledge transfer regarding efficient heating and ventilation practices and the monitoring of indoor climate. Responses were noted and fed into the central data base. A second data collection step to assess the short-term impact was implemented via a questionnaire-supported telephone call three months after the second household visit. Within the call, the households were asked about the state of application of the conveyed information on energy efficient heating and ventilation, perceived changes of comfort levels, or improvements regarding humidity induced issues in the dwelling. Furthermore, households with apartment-based gas heating meters were asked about the existence of a new heating bill. Lastly, to collect information on the long-term impacts of the new heating advice approach, another on-site visit of the households was carried out a year after the first one or as soon as a new heating bill was available.

**Table 19: Germany's data collection methods**

Project Performance Indicator	Method(s) for data collection	Data Source
Primary energy savings (GWh/year)	Estimated based on collected heating energy bills from the advised households	Heating energy bills of advised households
Investments in energy retrofit (million EUR)	N/A	N/A
Number of influenced documents - Statements from policy makers or national policy legislative documents	N/A	N/A
Number of households impacted by the policy	Collection via records of energy advisors	Central data base on implemented visits
Reduction of greenhouse gases emissions (in tCO <sub>2</sub> -eq/year)	Estimated based on collected heating energy bills from the advised households and weighted emission factor	Heating energy bills of advised households; GEMIS
Improved comfort levels/well-being of advised households	Collection via telephone/on-site questionnaire	Advised households
Sustainable knowledge transfer/application by advised households	Collection via telephone/on-site questionnaire	Advised households

### 5.4.3 Policy and Project Impacts

#### 5.4.3.1 Number and type of stakeholders

Table 20: Germany's REACT and Target group stakeholder composition

	Number of meetings	Landlords	Co-owners' associations	Tenants	Charitable and social work associations	Energy Agency / Energy consultants	Local policymakers	Regional policymakers	National policymakers	Utilities	Citizens groups / NGOs	Other (specify)
REACT	5	3	0	1	10	3	8	0	0	10	10	16 (Research institutes and researchers)
TARGET	6	0	0	118	0	19	0	0	0	0	40	6 (Research institutes )

#### 5.4.3.2 Gender of participants in REACT groups

N.B. For one Target group meeting no gender classification was provided.

Table 21: Germany's REACT and Target group gender composition

	Male	Female	Ratio
REACT (61 in total)	36	25	1.44:1 therefore ~7:5
TARGET (183 in total)	75	51	1.47:1 therefore ~7:5

#### 5.4.3.3 Number of decision makers used tool to inform policy or local decision making and/or number of experts used tool in workshop

The tool was not presented nor utilised as the implementation level of the policies was local, for which the tool only provides insufficiently granular data.

#### 5.4.3.4 Discussions on replication of the policies

Following the co-creative policy development, the implementing partner Caritas decided to rollout the approach to all 150 locations in Germany, in which the ElectricitySavingCheck is offered/implemented. To this end, the materials have been integrated in the central inventory, from which the different ElectricitySavingCheck branch offices can order them for use in their advice activities. In addition, trainings on the application of the approach and the use of the materials have been developed and offered to the energy advisors. Accordingly, the approach will be sustained beyond the project duration as it has become an integral part of the heating advice.

With view to the Pre-Paid app, the approach will not be further pursued by EnergieRevolve for strategic/financial reasons even though it might be picked up by other utilities as it is developed as a white label product.

#### 5.4.3.5 Meeting expectations of REACT groups

The stakeholders involved in the REACT group meetings were satisfied with the latter and expressed



that their expectations were met. It was suggested that the meetings could have been longer timewise.

#### **5.4.3.6 Annual primary energy savings triggered by the project and 5 years after the project**

The ENPOR project in Germany focused on two different policies, namely the pre-paid metering app (in collaboration with EnergieRevolve) and the Heating advice policy. The former presented a customer base of around 2,600 households, whereas the latter was aimed at 633 households, of which 589 received elements of the developed media package.

It was assumed that the pre-paid app would result in a 5% energy savings rate for its customers, considering an average yearly household electricity consumption of 2,700 kWh (as supplied by EnergieRevolve). Thus, by multiplying these by the number of affected households (2,600), it was found that a total of **0.35 GWh/year** were saved by the pre-paid app.

On the other hand, the heat energy advice policy would result in a 10% energy savings rate, considering an average yearly energy consumption for a German energy poor household of 150 kWh/m<sup>2</sup> for a 70 m<sup>2</sup> dwelling, resulting in 10,500 kWh/year. Hence, by multiplying the latter by number of affected households (589), it was found that **0.66 GWh/year** were saved thanks to the heat energy advice.

To conclude, a total of **1.01 GWh/year** were saved in Germany resulting from ENPOR policies, totalling 3.03 GWh over the whole duration of the project. Additionally, when spread over **5 years**, this equals to a total of **5.05 GWh**.

#### **5.4.3.7 Annual reduction of energy costs**

Following from the previous subsection, to obtain the reduction in costs triggered by ENPOR policies in Germany, the energy savings were multiplied by the energy costs. Thus, for the first policy, namely the pre-paid metering app, the energy savings were multiplied by the electricity price for households in Germany (0.35 EUR/kWh). Thus, it was obtained that **0.12 million EUR/year** were saved.

Similarly, for the heating energy advice policy, the energy savings were multiplied by the heat energy price for households in Germany (0.08 EUR/kWh<sup>39</sup>). Hence, **0.053 million EUR/year** were saved. In total, **0.17 million EUR/year** were saved in Germany due to ENPOR policies.

#### **5.4.3.8 Reduction of greenhouse gas emissions**

To calculate the resulting GHG emissions in Germany resulting from ENPOR policies, an emission factor of 486 g of CO<sub>2</sub> per kWh of energy consumed was assumed<sup>40</sup>. Thus, since 1.01 GWh were saved, this results in a reduction of **490.86 tonnes of CO<sub>2</sub> equivalent per year**.

#### **5.4.3.9 Investments in energy retrofits triggered by the project**

Both policies did not target energy retrofits but rather supported energy efficient behaviours. Accordingly, it is not possible to report any investments triggered by the project.

<sup>39</sup> Weighted price for one kWh of heat energy considering the share of different energy carriers for heating in Germany.

<sup>40</sup> <https://www.umweltbundesamt.de/themen/co2-emissionen-pro-kilowattstunde-strom-sinken>

#### **5.4.3.10 Contributions to energy efficiency policy development and to best practice development on energy poverty and/or small-scale renewable energy investments to be sustained beyond the period of EU support**

The ENPOR activities have contributed to further develop the ElectricitySavingCheck, which is a central measure for supporting vulnerable households in Germany. In addition, the regional Consumer Association, that participated in the co-creation process, indicated interest to take up the developed materials for their own advice offer, which targets a broader audience.

#### **5.4.3.11 Number of influenced documents**

As the ElectricitySavingCheck is not a public policy but a publicly funded programme, implemented by a charitable organisation in cooperation with the Association of German Energy Agencies, there is no mentioning or adaptations of existing legal documents. Similarly, as the Pre-paid app is an approach implemented by a public utility subsidiary (EnergieRevolve), there are no legal acts available here.

However, the Climate Alliance members, comprising almost 2,000 municipalities, adopted a resolution to mitigate energy poverty<sup>41</sup>. Climate Alliance and Wuppertal Institute have co-written and submitted a position paper on the draft law on the re-allocation of CO<sub>2</sub> costs, which was submitted to the German Cabinet on May 25, 2022. The draft proposes a graduated model on the basis of which CO<sub>2</sub> costs are to be divided fairly between tenants and landlords in the future according to specific building emissions and is developed jointly by the Federal Ministry of Ministry for Economic Affairs and Climate Protection and the Federal Ministry for Housing, Urban Development and Building in Germany. Finally, a practice guide called “Climate Protection in Municipalities” was published in German on the Federal Ministry of Economics and Climate website<sup>42</sup>.

#### **5.4.3.12 Number of households and or consumers impacted by the policy**

As mentioned in Section 5.4.3.6, during the ENPOR project **100%** of households that applied to the pre-paid app and became customers were affected by this policy, resulting thus in a total of **2,600** households. On the other hand, **93%** of the 633 households that were considered for the heat energy advice policy were affected by it, resulting in **589** households. Thus, in total, **3,189** households were impacted by ENPOR policies in Germany.

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<sup>41</sup> <https://www.enpor.eu/04-10-22-press-release-cities-and-towns-set-example-in-the-fight-against-energy-poverty/>

<sup>42</sup> <https://leitfaden.kommunaler-klimaschutz.de/>

## 5.5 Monitoring methodology in Greece

### 5.5.1 Description of each measure/policy, adaptation through the REACT groups, and comparison to the baseline scenario

#### 5.5.1.1 The Energy Upgrade of Buildings programme

Two pilot policies are examined within the framework of the ENPOR project. The first pilot policy in Greece is the national programme for the energy renovation of the residential buildings. The main aim 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). In fact, the ‘Energy Savings at Home’ programme is continued through the specific program more targeted to energy poor households. The ‘Energy Savings at Home’ programme started in 2011 providing financial incentives to households, including low-income households, for replacing the window frames and installing shading systems, insulating the building envelope, including the flat roof and “*pilotis*”, and upgrading the heating and hot water systems. The financial aid combined capital subsidies 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 proposal for the case of the “Energy upgrade of buildings” programme, as resulted by the application of the co-creation process within REACT group meetings, foresaw the inclusion of the tenants as a distinct social criterion, while the provided public aid must be calculated addressing 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 considering 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 were comprised of the existence of long-term unemployed members, disabled members, children and single-parent families. It should be noted that a specific weight was assigned to each criterion to calculate the final score of each submitted application separately. Moreover, a special provision for the rented buildings has been introduced foreseeing the provision of a 40 % subsidy to the landlords. Finally, a dedicated portion of the foreseen public budget was allocated to the 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 Energy Poverty in Greece.

The baseline for the case of the “Energy upgrade of buildings” programme was determined considering the rented-buildings renovated or approved for financing within the framework of the “Exoikonomo-Autonomo” program. The percentage of the supported households in the PRS was estimated accounting for the total number of households that participated in the programme to facilitate the comparative analysis with the planned “Energy upgrade of buildings” programme. Moreover, additional information was collected, such as the foreseen investments and the income of the participated households in the implemented programme.

### 5.5.1.2 The Energy Efficiency Obligation Scheme

The Energy Efficiency Obligation Schemes (EEOS) constitute the second pilot policy in Greece. The EEOS started in 2017 imposing an obligation to achieve a specific target through energy efficiency interventions. The conduction of energy efficiency interventions to energy poor households is also foreseen. The EEOS has been designed to undertake an essential role not only for 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).

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 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 EEOS foresees the conduction of targeted information and awareness-raising activities by the energy suppliers providing useful and effective guidance to energy poor households in the PRS, so as to combat the phenomenon of energy poverty. Specialised information material and interactive tools were utilised providing recommendations for the effective alleviation of energy poverty, while dedicated training programmes were organised aiming at the enhancement of the current knowledge of the energy poor households. Finally, the conduction of simplified energy audits fostered 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.

Regarding the baseline for the case of the EEOS, it was considered equal to zero since no targeted awareness raising measure has been initiated for combating energy poverty in the PRS. A horizontal campaign was implemented in 2017 by the Public Power Corporation (PPC SA) within the framework of the EEOS aiming at the promotion of energy efficiency in energy poor households, which has not currently had any effect regarding the effective alleviation of energy poverty in the PRS.

### 5.5.2 Data collection and monitoring methods

The required data for the case of the "Energy upgrade of buildings" programme was provided by the authority, which was responsible for the coordination and administration of the program. The provided data included the number of affected energy poor households and the foreseen investments that were approved by the program. It should be noted that the respective data was collected for all the approved applications in order to facilitate the comparative analysis with the baseline. Moreover, the expected primary energy savings and the foreseen CO<sub>2</sub> reduction were collected by the Energy Performance Certificates, which will be issued before and after the implementation of the energy efficiency interventions.

The required data for the case of the EEOS was provided by the PPC SA, which plans to implement a targeted awareness-raising measure for energy poor households in the PRS. The provided data regarding the affected energy poor households was controlled and verified by the Administrator for the calculation, monitoring, control, and verification of the EEOS, while the delivered energy savings (both final and primary) were calculated according to the measurement protocol of the scheme.

Finally, a qualitative assessment of the effectiveness of both the adapted pilot policies was conducted by the REACT groups identifying the potential barriers.

**Table 22: The Greek data collection method for the case the “Energy upgrade of buildings” programme**

Project Indicator	Performance	Method(s) for data collection	Data Source
Primary energy savings (GWh/year)		Estimation based on the issued Energy Performance Certificates before and after the implementation of the energy efficiency interventions	Issued Energy Performance Certificates
Investments in energy retrofit (million EUR)		Collection of the foreseen investments for the energy poor households, which will participate and be financed by the program	Authority of the coordination and administrator of the program
Reduction of greenhouse gases emissions (in tCO <sub>2</sub> -eq/year)		Estimation based on the issued Energy Performance Certificates before and after the implementation of the energy efficiency interventions	Issued Energy Performance Certificates
Number of households that experience energy poverty impacted by the policy		Collection of the number of the energy poor households, which will participate and be financed by the program	Authority of the coordination and administrator of the program
Qualitative assessment of the policy		Evaluation of the measures as resulted by the survey, which will be conducted amongst the members of the REACT group with questions related to the effectiveness of the implemented measure	Survey with the participation of the REACT group’s members

**Table 23: The Greek data collection method for the case of the EEOS**

Project Indicator	Performance	Method(s) for data collection	Data Source
Primary energy savings (GWh/year)		Estimation based on the calculated final energy savings as resulted by the implementation of the measurement protocol within the EEOS	Administrator for the calculation, monitoring, control and verification of the EEOS
Number of households that experience energy poverty impacted by the policy		Collection of the number of the energy poor households, which will participate in the implemented awareness raising measure as will be controlled and verified within the EEOS	Administrator for the calculation, monitoring, control and verification of the EEOS
Reduction of greenhouse gases emissions (in tCO <sub>2</sub> - eq/year)		Estimation based on the calculated and verified final energy savings within the EEOS	Administrator for the calculation, monitoring, control and verification of the EEOS
Qualitative assessment of the policy		Evaluation of the measures as resulted by the survey, which will be conducted amongst the members of the REACT group with questions related to the effectiveness of the implemented measure	Survey with the participation of the REACT group’s members

### 5.5.3 Policy and Project Impacts

#### 5.5.3.1 Number and type of stakeholders

**Table 24: Greece’s REACT and Target group stakeholder composition**

	Number of meetings	Landlords	Co-owners’ associations	Tenants	Charitable and social work associations	Energy Agency / Energy consultants	Local policymakers	Regional policymakers	National policymakers	Utilities	Citizens groups / NGOs	Other (specify)
REACT	3	6	0	0	0	13	0	0	7	7	7	17 (Academia) 12 (Networks/ associations)
TARGET	4	0	0	0	0	8	0	0	1	6	2	0

### 5.5.3.2 Gender of participants in REACT groups

Table 25: Greece's REACT and Target group gender composition

	Male	Female	Ratio
REACT (69 in total)	36	33	1.09:1
TARGET (17 in total)	5	12	0.41:1

### 5.5.3.3 Number of decision makers used tool to inform policy or local decision making and/or number of experts used tool in workshop

Four policy makers from the Ministry of Environment and Energy used the tool. Three additional experts from academia and utility used the tool.

### 5.5.3.4 Discussions on replication of the policies

The modified pilot policies ("energy saving at home" programme and EEOS for awareness raising measure) have been included within the Action Plan for the Alleviation of Energy Poverty as resulted by the applied co-creation process. A specific reference has been added in Measure 4 of the action plan for promoting energy efficiency and RES technologies to energy poor households in the PRS ensuring the fair allocation of the delivered benefits between the tenant and the landlord. Moreover, the explanatory parameter "tenants" has been included within the logic model for quantifying the energy poverty levels. Therefore, the split incentive problem has been introduced within the action plan affecting all the current and planned policy measures.

### 5.5.3.5 Meeting expectations of REACT groups

The stakeholders involved in the REACT group meetings expressed through a survey that they were satisfied with the meeting and that their expectations had been met.

### 5.5.3.6 Annual primary energy savings triggered by the project and 5 years after the project

The number of affected energy poor households is equal to 142,820 households as explained in more detail in Section 5.5.3.12. The delivered energy savings are expected to be equal to 38.5 GWh. The estimation of the delivered energy savings was based on the official measurement protocol of the EEOS taking into consideration that the average energy consumption is equal to 7,397 kWh/household, while the energy saving factor of the implemented measures amounted to 3% in M1 and 10% in M2-M4. Hence, in the next 5 years, 192.5 GWh of energy savings can be expected.

The number of affected energy poor households in the PRS is equal to **30,428** households taking into account that the share of the energy poor households that rent their building is equal to 21.3% according to the received data by the Action Plan for the alleviation of Energy Poverty. The delivered energy and cost savings will amount to **8.2 GWh**.

For the case of the "energy saving at home" programme, it was estimated that 15,169 households will manage to renovate their building within the framework of all rounds. It should be noted that the programme aims at the energy renovation of 105 thousand residential buildings totally. The delivered energy savings are equal to 211.32 GWh if the unitary energy savings amount to 163.9 kWh/m<sup>2</sup> and the average area to 80 m<sup>2</sup>. The renovated area will be equal to 1.2 million m<sup>2</sup>.

Moreover, the number of the affected energy poor households that dwell in rented buildings will be equal to 1,499 households leading to **20.9 GWh** energy savings to the renovation of 119 thousand m<sup>2</sup>. The calculation was based on the available data by the Action Plan for the alleviation of Energy Poverty. More specifically, the share of energy poor households in the total population is equal to 19.1% that dwell in rented buildings.

#### **5.5.3.7 Annual reduction of energy costs**

The cost savings will amount to 5.0 million €. The estimation of the cost savings was based on the assumption that 80% of the energy savings will be derived by fossil fuels and 20% by electricity. The energy prices were assumed equal to 100 €/MWh and 250 €/MWh for the case of fossil fuels and electricity respectively. The cost savings for energy poor citizens that dwell in the PRS will be of **1 million €**.

#### **5.5.3.8 Reduction of greenhouse gas emissions**

The CO<sub>2</sub> emission reduction will amount to 11.5 ktn CO<sub>2</sub>. The estimation of the CO<sub>2</sub> savings assumed that 80% of the energy saving were going to be derived by fossil fuels and 20% by electricity. The CO<sub>2</sub> emission factor was assumed equal to 0.264 tn/MWh and 0.437 tn/MWh for the case of fossil fuels and electricity respectively. The CO<sub>2</sub> emission reduction related to energy poor citizens in the PRS will be of **2.5 ktn of CO<sub>2</sub>**.

On the other hand, the emissions reduction stemming from the “energy saving at home” programme will be of 63.1 ktn of CO<sub>2</sub>. If considering only energy poor citizens in the PRS, these amount to **6.2 ktn of CO<sub>2</sub>**.

#### **5.5.3.9 Investments in energy retrofits triggered by the project**

The renovation of the 15,169 residential buildings within the framework of the "energy saving at home" programme amounted to 274.3 million € as resulted by the elaboration of the actual data about the required investments. The respective investments due to the renovation of the 1,499 buildings, which are rented by energy poor households, are equal to **25.8 million €**.

#### **5.5.3.10 Contributions to energy efficiency policy development and to best practice development on energy poverty and/or small-scale renewable energy investments to be sustained beyond the period of EU support**

This was answered in Section 5.5.3.4.

#### **5.5.3.11 Number of influenced documents**

The Action Plan for the alleviation of Energy Poverty was adapted taking into account the discussions within the REACT group meetings and the modified pilot policies ("energy saving at home" programme and EEOS for awareness raising measure).

#### **5.5.3.12 Number of households and or consumers impacted by the policy**

For the case of the energy efficiency obligation scheme, the PPC implemented within 2023 one horizontal campaign (participation of 4,341,697 households in M1) and three targeted campaigns

(participation of 77,642 households in M2, 5,719 households in M3 and 7,201 energy poor households in M4 respectively).

The total number of the affected households is equal to:

- 1,044,786 households in M1
- 58,387 households in M2
- 4,301 households in M3
- 5,415 energy poor households in M4

The estimation was based on the official measurement protocol of the EEOs taking into account that the percentage of the affected households in horizontal awareness measures (32%), the percentage of the affected households in targeted awareness measures (100%), the reduction due to the awareness measures by other obligated parties in 2023 (80%) and the reduction due to the affected households by all obligated parties in the previous year (96%).

The number of the affected energy poor households is equal to **142,820 households** considering that the share of the energy poor households in the total population is equal to 12.4% according to the Action Plan for the alleviation of Energy Poverty.

For the case of the "energy saving at home" programme, it was estimated that **15,169 households** will manage to renovate their building within the framework of all rounds. It should be noted that the programme aims at the energy renovation of 105 thousand residential buildings totally.



## 5.6 Monitoring methodology in Italy

### 5.6.1 Description of each measure/policy, adaptation through the REACT groups, and comparison to the baseline scenario

#### 5.6.1.1 National Training and Information Programme

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 fundamental driver to create, reinforce and develop the attention towards energy saving and energy efficiency. Article 13 of Legislative Decree 102/2014, indeed, envisioned a specific Three-Year Training and Information Program, the elaboration of which was realized by ENEA involving different actors as Regions, consumer associations, and associations of ESCOs and energy services companies.

A new national EE program for information and training actions was foreseen with Legislative Decree 73/2020 art. 12 which should be funded by the Ministry of Ecological Transition. On the 3<sup>rd</sup> of September 2021, the online public consultation closed. The new program was included in the National Recovery and Resilience Plan (Piano Nazionale di Ripresa e Resilienza, NRRP) as a part of the Next Generation EU (NGEU), under 1.1 Mission 2, Component 3.

Through the REACT group, inputs on the information considered more relevant for energy poor households and how to make them available were discussed. In addition, tax deduction schemes currently available in Italy were illustrated in the REACT groups to assess how information should be provided to energy poor households to help them access these schemes more easily. The feedback of the REACT group were used to help define the best modalities to communicate with the energy poor in the PRS and engage them in future information campaign initiatives.

#### 5.6.2 Data collection and monitoring methods

Through questionnaires, data were collected on the energy consumption and habits of a group of households. After a period of 10-12 months, data were collected again from them through questionnaires. The comparison of the data, before and after the training activities was carried out and enabled to determine how much influence the information/training initiative had on these households.

Table 26: Italy's data collection methods

Project Performance Indicator	Method(s) for data collection	Data Source
Primary energy savings (GWh/year)	Questionnaire	Energy bills
Investments in energy retrofit (million EUR)	Questionnaire	Questionnaire
Reduction of greenhouse gases emissions (in tCO <sub>2</sub> - eq/year)		Calculation based on energy savings
10% savings	Questionnaire	Questionnaire
Improved comfort levels of advised households	Questionnaire	Questionnaire

### 5.6.3 Policy and Project Impacts

#### 5.6.3.1 Number and type of stakeholders

Table 27: Italy's REACT and Target group stakeholder composition

	Number of meetings	Landlords	Co-owners' associations	Tenants	Charitable and social work associations	Energy Agency / Energy consultants	Local policymakers	Regional policymakers	National policymakers	Utilities	Citizens groups / NGOs	Other (specify)
REACT	4	0	6	0	0	4	0	2	0	0	6	3 (academia) 11 (building manager associations) 21 (trade and professional association interested in the energy efficiency sector) 2 consumer associations
TARGET	0	0	0	0	0	0	0	0	0	0	0	0

#### 5.6.3.2 Gender of participants in REACT groups

Table 28: Italy's REACT and Target group gender composition

	Male	Female	Ratio
REACT (21 in total)	9	13	9:13
TARGET	0	0	0

#### 5.6.3.3 Number of decision makers used tool to inform policy or local decision making and/or number of experts used tool in workshop

The Energy Poverty Dashboard (EPD) and the split incentive tool were presented during the last REACT group meeting to roughly 20 participants. The EPD was also presented during two events in Bologna and Cosenza. Moreover, it was inserted and illustrated in the Annual Report on Energy Efficiency 2022 (RAEE), one of ENEA's most important and widespread publication on energy efficiency. Also in the RAEE 2023 both the EPD and the split incentive tool were mentioned.

#### 5.6.3.4 Discussions on replication of the policies

Not applicable as in Italy there was not a new policy under discussion. What shall be replicated are the communication and awareness actions that were carried out, involving also building managers associations and especially among students, and that were successful in capturing their interest and in pushing them to implement at-home behaviours aimed at improving energy efficiency and reducing energy consumption.

#### 5.6.3.5 Meeting expectations of REACT groups

The stakeholders involved in the REACT group meetings expressed that they were satisfied with the

latter, stating that their expectations had been met. As only suggestion, it was expressed that more time could have been given to the brainstorming part of the meeting.

#### **5.6.3.6 Annual primary energy savings triggered by the project and 5 years after the project**

The ENPOR project in Italy implemented a soft measure, focused on training students and building managers with regards to energy poverty and energy efficient behaviours. As such, a total of 232 households were targeted. Of these, 20% were affected by the measure.

It was assumed that the training campaign of high school students would result in a 2% energy savings rate for their households. The average household energy consumption in Italy was assumed to be 1.5 tep/year<sup>43</sup>, which when converted to kWh and multiplied by the number of households considered, resulted in 4,047,240 kWh/year. Thus, by multiplying these by the energy savings rate and the number of affected households, it was found that a total of **4 GWh/year** were saved thanks to the soft measure. Hence, over the duration of the project, 12 GWh were saved. To conclude, a total of **20 GWh** could be saved in the **next 5 years**.

#### **5.6.3.7 Annual reduction of energy costs**

Thanks to the energy savings, it can be found that **0.45 million EUR** of cost reduction annually could be triggered by the ENPOR project.

#### **5.6.3.8 Reduction of greenhouse gas emissions**

From the energy savings, it was found that **878.1 Kg** of GHG emissions **per year** could be saved thanks to the implementation of soft measures.

#### **5.6.3.9 Investments in energy retrofits triggered by the project**

Assuming that a total of 1000 EUR were cumulative invested by European stakeholders in sustainable energy, it was found that **0.05 million EUR** were triggered by the ENPOR project.

#### **5.6.3.10 Contributions to energy efficiency policy development and to best practice development on energy poverty and/or small-scale renewable energy investments to be sustained beyond the period of EU support**

Thanks to the ENPOR project, in the National Training and Information Programme on energy efficiency "Italia in Classe A", more space and visibility has been given to the issue of energy poverty in the PRS. The activities put in place and the increasing attention devoted to how energy efficiency interventions can contribute to reduced energy poverty and energy efficiency ensure that further communication and training actions will continue and intensify after the end of the project.

#### **5.6.3.11 Number of influenced documents**

Not applicable to national legislative documents since the co-creation process focused on communication and training activities directed at energy poor households, landlords, and building managers. However, the material published received the official support of several associations that participated to the REACT groups and it was presented during the event in Cosenza to the local policy

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<sup>43</sup> ENEA elaboration on 2017 data of the Italian Regulatory Authority for Energy, Networks and Environment

maker who appreciated it and was interested in distributing it to the building managers in his area. In ENEA's Annual Report on Energy Efficiency 2022 and 2023 (RAEE) ENPOR was mentioned and discussed, which is relevant due to ENEA's influence within Italy's energy sector. Although not a document, the "Italia in Classe A" Programme was impacted by ENPOR.

#### **5.6.3.12 Number of households and or consumers impacted by the policy**

As mentioned in Section 5.6.3.6, during the ENPOR project 20% of households were affected by the soft policy, resulting thus in a total of 46 households.

## 5.7 Monitoring methodology in The Netherlands

### 5.7.1 Description of each measure/policy, adaptation through the REACT groups, and comparison to the baseline scenario

#### 5.7.1.1 Energy Box

The Energy Box was established in 2014 by the Jonge Milieu Adviesbureau (JMA), the municipality of Utrecht and the social housing associations Mitros and Portaal. The goal of the Energy Box project is to reduce the energy consumption of residents. The Energy Box 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. Based on the consultation, the coach provides the residents with energy-saving tips in a report tailored to the resident's situation. The tips could be implemented by the residents without high 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. The results of the Energy Box speak for itself: more than 40,000 residents have received energy advice since its establishment in 2014, and more than 4.5 million Euros were saved per year by households through use of the Energy Box ([www.energiebox.org](http://www.energiebox.org), 23-11-23).

The main challenge as identified by the JMA was how to better reach the target group of private tenants, specifically those experiencing energy poverty. According to desk research (Mashhoodi, Stead & Van Timmeren, 2019<sup>44</sup>; Churchill & Smyth, 2020<sup>45</sup>; Doukas & Marinakis, 2020<sup>46</sup>; Ampofo & Mabefam, 2021<sup>47</sup>) our target group of energy poor tenants was most likely to be found amongst the population perceiving the lowest 40% of income: retirees, large families, immigrants/people of non-Dutch ethnicity, students, and religious groups. With their original campaigns, private tenants make up only a small percentage of the participants of Energy Box. The Energy Box was originally developed in cooperation with social housing corporations, so the JMA has a lot of experience reaching tenants in the social rented sector. The focus of our design process has therefore been on redesigning the Energy Box trajectory of promotion for the PRS. These efforts will not necessarily be focused on the layout of the programme, but mainly on reaching the target group.

As part of our co-design process, we've conducted interviews with relevant stakeholders and organized several REACT Group meetings. These meetings focused on exploring the problem of energy poverty in the PRS in the Netherlands as well as gaining insights in the target group of private tenants and landlords. Furthermore, they were used to understand the challenges and barriers that programmes like the Energy Box are facing. We've spoken to (representatives of) municipalities, housing agencies, landlords, energy coaches and tenants. The results of these meetings have led to a proposal for (re)design of a tool for communication strategies.

As said above, JMA has most experience with reaching social tenants through cooperation with social housing corporations. In this case, generally tenants are offered an Energy box and consultation

<sup>44</sup> Mashhoodi, B., Stead, D., & van Timmeren, A. (2019). Local and national determinants of household energy consumption in the Netherlands. *GeoJournal*, 85 (2020), 393-406. <https://doi.org/10.1007/s10708-018-09967-9>

<sup>45</sup> Awaworyi Churchill, Sefa, Smyth, Russell and Farrell, Lisa, (2020), Fuel poverty and subjective wellbeing, *Energy Economics*, 86, issue C, number S0140988319304475, <https://EconPapers.repec.org/RePEc:eee:eneeco:v:86:y:2020:i:c:s0140988319304475>.

<sup>46</sup> Haris Doukas & Vangelis Marinakis (2020) Energy poverty alleviation: effective policies, best practices and innovative schemes, *Energy Sources, Part B: Economics, Planning, and Policy*, 15:2, 45-48, DOI: 10.1080/15567249.2020.1756689

<sup>47</sup> Ampofo, Akwasi & Mabefam, Matthew Gmalifo, 2021. "Religiosity and Energy Poverty: Empirical evidence across countries," *Energy Economics*, Elsevier, vol. 102(C).

through an invitation letter from the housing corporation by post or email. The experience is that this leads to a response rate of approximately 10%. In addition, there are home-to-home promotional visits which increase the response rate to around 15%. In the little experience JMA has of working with private housing corporations, the response rate seems to be lower. It is therefore assumed that a different communication strategy should be used.

In addition, the population of private tenants currently reached with the Energy Box is not necessarily experiencing energy poverty. We conducted a survey amongst 88 private tenants who previously received the Energy box and consultation. When asked whether they were struggling to pay their energy bill each month, only 1 respondent indicated “always” and 13 respondents (16%) “sometimes”. Of these tenants, 82% said that they never struggle to pay their energy bills. Keeping in mind that these numbers might be biased by those completing the survey, they do indicate that the Energy Box was reaching very few private tenants who experience energy poverty. The goal of our redesign was increasing both the response rate amongst private tenants as well as the percentage of respondents that struggle to pay their energy bills.

### 5.7.2 Data collection and monitoring methods

The implementation of the (re)designed approach and subsequent communication strategies was monitored with data on the number of advised households from JMA as well as regular meetings with JMA representatives. All advised households received an evaluation survey. Additionally, we conducted a number of qualitative interviews with advised households. An additional survey was sent after 6-12 months with questions relating to the experience of energy poverty (which cannot be concluded in the evaluation survey) as well as on the long-term impact of the policy.

Table 29: The Netherlands’ data collection methods

Project Performance Indicator	Method(s) for data collection	Data Source
Primary energy savings (GWh/year)	Are estimated based on the included energy saving tips and an assumed implementation rate of the advised households and other reached stakeholders.	Information from JMA on the number of advised households
Number of households impacted by the policy	The number of households assessed with the help of the materials can be obtained directly from JMA.	Direct information from JMA
Reduction of greenhouse gases emissions (in tCO <sub>2</sub> - eq/year)	Are estimated based on the included energy saving tips and an assumed implementation rate of the advised households and other reached stakeholders.	Information from JMA on the number of advised households
Number of households that experience energy poverty impacted by the policy	These are based on a survey amongst advised households with questions related to the experience of energy poverty.	Survey

### 5.7.3 Policy and Project Impacts

#### 5.7.3.1 Number and type of stakeholders

Table 30: The Netherlands’ REACT and Target group stakeholder composition

	Number of meetings	Landlords	Co-owners’ associations	Tenants	Charitable and social work associations	Energy Agency / Energy consultants	Local policymakers	Regional policymakers	National policymakers	Utilities	Citizens groups / NGOs	Other (specify)
REACT	7	8	0	9	15	9	6	0	0	0	0	0
TARGET	4	0	0	425	10	3	0	0	0	1	0	0

### 5.7.3.2 Gender of participants in REACT groups

In the Netherlands, gender is no longer asked during meetings to encourage inclusivity. We did not inquire about gender because there is currently a debate about the choices.

### 5.7.3.3 Number of decision makers used tool to inform policy or local decision making and/or number of experts used tool in workshop

Not relevant for the Energy Box programme.

### 5.7.3.4 Discussions on replication of the policies

We worked in three municipalities as part of the ENPOR project. One of them just has continued the Energy Box program into 2024. The program is being continued in four different formats. The most significant one involves a light box, accompanied by a visit from an energy coach and the installation of energy-saving measures. Additionally, there is a pathway where individuals experiencing energy poverty receive more comprehensive advice.

HU and JMA continue to work together in the follow up project whose aim is to contact “harder-to-reach” target groups named ‘*Voor elkaar, tegen voedselverspilling en energieongelijkheid!*’, further described in Section 5.7.3.10, is a great example of successful replication of policies stemming from the ENPOR project in the Netherlands.

### 5.7.3.5 Meeting expectations of REACT groups

The stakeholders involved in the REACT group meetings were satisfied and expressed that their expectations were met with one exception. One stakeholder stated that the meeting proved that the policy campaign was useful and that it gave extra inputs on how to improve it. However, even more interaction between the different groups of people attending the meetings was also suggested by another stakeholder.

### 5.7.3.6 Annual primary energy savings triggered by the project and 5 years after the project

The ENPOR project in the Netherlands focused on the Energy box. This tool was delivered to approximately 17,000 households throughout the province of Utrecht. Of these, 8% were in the PRS, hence **1,330** households were affected.

Following a survey where households that received the Energy box were questioned, it was found that on average such household would save 2,259 kWh (257 m<sup>3</sup>) of natural gas and 268kWh of electricity per year thanks to the energy box, the energy advice and additional own investments. This converts to , for a total of 2,898 kWh of primary energy per year (taking into account a conversion efficiency of 42% for electricity) . Thus, if multiplied by the number of total affected households, this resulted in 3.9 **GWh/year** of energy saved. Spread over 5 years, this results in a total of **19.3 GWh**.

### 5.7.3.7 Annual reduction of energy costs

To calculate the annual reduction of energy costs, we considered the average energy prices for 2021, 2022 and 2023 (only variable costs including VAT, the Renewable Energy surcharge, the Energy Tax, and the price cap). When considering electricity, these were respectively 0.22 EUR/kWh, 0.29 EUR/kWh, and 0.4 EUR/kWh. When considering gas, these were 0.82 EUR/m<sup>3</sup>, 1.36 EUR/m<sup>3</sup>, and 1.35

EUR/m<sup>3</sup>. Hence, by multiplying the yearly energy savings by the different prices and taking an average, it was found that 402 kEUR of gas were saved annually and 108 kEUR of electricity. Hence, a total of **510 kEUR** were saved.

#### 5.7.3.8 Reduction of greenhouse gas emissions

To calculate the resulting reduction of greenhouse gas (GHG) emissions in the Netherlands resulting from ENPOR policies, an emission factor of 420 g of CO<sub>2</sub> per kWh of electricity consumed and 1.782 kg of CO<sub>2</sub> per m<sup>3</sup> of gas consumed were assumed. Thus, this resulted in 609 tons of CO<sub>2</sub> from gas saved and 103 tons of CO<sub>2</sub> saved from electricity, for a total of 712 tonnes **of CO<sub>2</sub> equivalent** per year.

#### 5.7.3.9 Investments in energy retrofits triggered by the project

The energy box does not trigger energy retrofitting investments.

#### 5.7.3.10 Contributions to energy efficiency policy development and to best practice development on energy poverty and/or small-scale renewable energy investments to be sustained beyond the period of EU support

- A more tailor-made approach for delivering the energy box and the subsequent energy advice has become an improved practice
- Research on the energy voucher programme in Zeist provided insights in the results, and the effectiveness of our voucher campaign, and it provided ideas on how to improve future campaigns on energy poverty reduction.
- A follow up project to get in contact with “harder-to-reach” target groups, ‘*Voor elkaar, tegen voedselverspilling en energieongelijkheid!*’, was a direct result of the ENPOR project. The new project involves designing/implementing strategies to reach out to energy poor people via “food banks”.

#### 5.7.3.11 Number of influenced documents

Five documents were influenced by the ENPOR measure in the Netherlands. These are detailed below.

- In a document published by the Municipality of Utrecht<sup>48</sup>, it is specifically mentions that tenants are overlooked and the Municipality is therefore now looking for solutions in rectifying this. This follows their interaction with the ENPOR Energy Box.
- In another document published by the Municipality of Utrecht<sup>49</sup>, a special approach for the PRS is being worked on and planned to be implemented in second half of 2023.
- In a third document published by the Municipality of Utrecht<sup>50</sup>, the broadening of the Energy Box Services was pledged, with a special focus on housing rented to students. Additionally, it describes the launch of the Energy Coalition between Energy Box and other social partners.
- In a final document published by the Municipality of Utrecht<sup>51</sup>, the municipality mentions their focus on the door-to-door methodology of distributing Energy Boxes, the number of

<sup>48</sup> <https://utrecht.bestuurlijkeinformatie.nl/Reports/Document/637eee68-33d1-4565-a1a7-5679289356b2?documentId=46fd9578-cc52-47db-b476-4326a0491a47>

<sup>49</sup> <https://www.armoedecoalitie-utrecht.nl/wp-content/uploads/2023/03/raadsbrief-aanpak-koopkracht-en-energiecrisis-februari2023.pdf>

<sup>50</sup> <https://utrecht.bestuurlijkeinformatie.nl/Reports/Document/0158172f-9535-4623-9255-62eb9ca72f8f?documentId=7de117bb-d812-4049-ad49-440d5a8b4c47>

<sup>51</sup> <https://utrecht.bestuurlijkeinformatie.nl/Reports/Document/f05b2e29-65b9-4bcc-b383-8315ce30b943?documentId=a4a9d8a5-8e7a-4274-9173-ea2eb4005c84>



- boxes distributed, as well as the launch of a hotline for tenants to report landlord violations.
- Energy Boxes are specifically mentioned by the Ministry of the Interior and Kingdom Relations<sup>52</sup> as relevant and useful solutions for municipalities to make use of to fight energy poverty amongst house owners, social housing and in the PRS.

#### **5.7.3.12 Number of households and or consumers impacted by the policy**

As mentioned in Section 5.7.3.6, during the ENPOR project **8%** of households that applied to the energy box and became customers were affected by this policy, resulting thus in a total of **1,330** households in the province of Utrecht.

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<sup>52</sup> Bijlage-Toolkit-Aanpak-Energiearmoede-Knelpunten-en-oplossingsrichtingen.pdf

## COMBINED MONITORING RESULTS

### 6.1 Policy and Project Impacts

#### 6.1.1 Number and type of stakeholders

Table 3132: A summary of all REACT and Target groups' stakeholder composition

	Number of meetings	Landlords	Co-owners' associations	Tenants	Charitable and social work associations	Energy Agency / Energy consultants	Local policymakers	Regional policymakers	National policymakers	Utilities	Citizens groups / NGOs	Other (specify)
REACT	51	17	21	10	33	82	38	3	97	40	76	25 (academia) 11 (building manager associations) 21 (trade and professional association interested in the energy efficiency sector) 4 (chamber of labour) 9 (other) 2 (SMEs) 5 (private companies) 2 (journalists) 16 (research institutions) 12 (networks/associations) 2 (consumer associations)
TARGET	22	0	0	543	14	44	4	1	1	7	63	2 (academia) 1 (HGK Croatian chamber of commerce) 186 (citizens) 5 (Housing associations) 6 (research institutes) 8 (other)

#### 6.1.2 Gender of participants in REACT groups

Please note, gender was not provided for the Netherlands.

Table 33: A summary of all REACT and Target groups' gender composition

	Male	Female	Ratio
REACT	206	218	0.98:1
TARGET	184	210	0.88:1

#### 6.1.3 Number of decision makers used tool to inform policy or local decision making and/or number of experts used tool in workshop

In the following section, the total number of decision-makers that used the EPD and/or the split incentive tool to inform local decision making together with the number of experts that utilised any of the two tools in workshops was analysed. Firstly, the definition taken hereby of "decision-makers"

was clarified. A broad definition was chosen, namely: any person who is in a position to make policy, and thus not restricted directly to government policy, but including also for example academia. Essentially, decision-makers were deemed as professionals whose interests and positions motivated them to submit a policy and were thus interested in utilising the developed tools.

In the previous sections, the number of decision-makers and experts that utilised the tools was clarified per country. Here, these were taken together in addition to other more general figures. In fact, the EPD was utilised by 16 organisations. Additionally, since its launch in September 2021 until the end of September 2023, 1,100 users from 84 countries utilised the platform, with a total of 3,933 page views.

It was found that a total of 11 decision-makers used the tool to inform government policy or local decision-making. However, 57 policies were submitted to the EPD, increasing the total number of decision-makers to **68**. Similarly, a total of **49** experts were found to have utilised the tools during ENPOR-organised workshops. Although it is impossible to know if those who submitted the 57 policies to the EPD were decision makers, it is likely that they work in the field of energy efficiency and therefore have an influence on energy efficiency and energy poverty regulations and interests. In the worst case scenario, assuming that the 57 policies were submitted by citizens, or that multiple policies were submitted by the same person, **a minimum of 60** policy makers and experts used the tool before or during the ENPOR workshops.

#### 6.1.4 Discussions on replication of the policies

The ENPOR project's initiative has seen a diverse range of adoptions and applications across various partner countries.

In Austria, the response to these policies was overwhelmingly positive, with a remarkable 95% of policymakers acknowledging their relevance and applicability within their local context. Croatia experienced a proactive engagement, with a national-level project sparking policy amendment discussions and the consideration of a questionnaire's national application, initially piloted in Zagreb. This effort was substantiated by feedback from decision-makers, 10 out of 15 of whom affirmed the value of the data gathered for informing policy design. In Estonia, the unanimity among policymakers was clear, with all participants in the last REACT group meeting recognizing the imperative to persist in policy efforts to alleviate energy poverty. Germany witnessed a strategic expansion by Caritas, which adopted the co-creative policy development, embedding it into their operational framework for long-term application. However, it's notable that the Pre-Paid app initiative by EnergieRevolve was discontinued due to strategic and financial considerations. Greece made significant strides by integrating modified pilot policies into its Action Plan for the Alleviation of Energy Poverty, effectively tackling the split incentive dilemma and incorporating tenants into the energy poverty assessment framework. Italy, while not engaging in new policy discussions, concentrated on duplicating communication and awareness initiatives, particularly targeting the youth to instil energy-efficient practices. Lastly, the Netherlands set an example of successful policy replication with a follow-up project designed to engage more elusive target groups, further extending the reach and impact of the ENPOR project.

Collectively, these efforts underscore a strong commitment across the partner countries to address energy poverty and to foster energy efficiency in the PRS. The range of activities, from policy reform discussions to the implementation of practical energy advice and awareness campaigns, all converge on the shared objective of achieving sustainable and equitable energy consumption. This collaborative endeavour not only reflects the adaptability of policies to different national contexts but also highlights the collective drive towards a more energy-conscious future.

### 6.1.5 Meeting expectations of REACT groups

The REACT group meetings, integral to the ENPOR project, have got positive feedback from stakeholders across various partner countries, reflecting satisfaction with the initiative.

Stakeholders in Austria, Estonia, and Greece uniformly reported that their expectations were met, with surveys from these countries confirming a successful outcome from the meetings. This sentiment of contentment was mirrored in Italy, where participants were pleased but suggested more time for brainstorming could enhance the experience. Also, German stakeholders uniquely pointed out that extending the duration of the meetings could lead to more fruitful discussions and outcomes. In Croatia and the Netherlands, while the overall response was positive, stakeholders offered specific suggestions for improvement. Croatian participants recommended smaller meetings to enable more in-depth policy discussions, particularly on diverse energy topics such as solar energy. Dutch stakeholders appreciated the utility of the meetings in advancing policy campaigns but highlighted a desire for increased interaction between different groups of attendees.

Collectively, these reflections indicate that the REACT group meetings have been effective in fostering dialogue and developing policies, with stakeholders actively participating and providing constructive feedback. The desire for longer meetings, more intensive discussions, and increased interaction among participants suggests a commitment to deepening engagement and enhancing the collaborative process in future sessions.

### 6.1.6 Annual primary energy savings triggered by the project and 5 years after the project

The ENPOR project throughout the 7 different pilot countries, contributed to a total of **51.53 GWh/year of annual energy savings**. This amounts to a total of 154.59 GWh of energy savings throughout the three years project duration. As such, it can be estimated that in the **5 years** following the end of the ENPOR project, a total of an additional **257.65 GWh** of energy savings will likely be achieved.

### 6.1.7 Annual reduction of energy costs

To calculate the resulting reduction in energy costs in total resulting from ENPOR policies, different emission factors per kWh of fuel consumed were considered for the different case studies. When summing all these together, it was found that a total of **6,619,073 EUR/year** were saved.

### 6.1.8 Reduction of greenhouse gas emissions

To calculate the resulting reduction of GHG emissions in total resulting from ENPOR policies, different emission factors per kWh of electricity consumed were considered for the different case studies. When summing all these together, it was found that a total of **22,594.89 tonnes of CO<sub>2</sub> equivalent** were saved per year.

### 6.1.9 Investments in energy retrofits triggered by the project

Assuming different rates of investments per country, it was found that during the ENPOR project, in total **72.05 million EUR** worth of investments were triggered by the ENPOR project.

### **6.1.10 Contributions to energy efficiency policy development and to best practice development on energy poverty and/or small-scale renewable energy investments to be sustained beyond the period of EU support**

The ENPOR project has been instrumental in advancing initiatives meant to have a lasting impact.

In Austria, the project's legacy includes a new training format for energy advisors and the inception of a coordination office for energy poverty, which is legislated to operate until at least 2030. Croatia saw the ENPOR project's influence in public consultations that shaped the "Programme for energy renovation of multi-apartment buildings" and the "Programme for alleviation of energy poverty." Notably, the project's best practices were crystallized through detailed surveys in pilot cities and effective partnerships with organizations like the Red Cross, which facilitated direct engagement with households.

Estonia's national renovation grant program, benefiting from the project since 2010, has been invigorated with new proposals to enhance renovation capacity, ensuring its continuation with funding until 2027. In Germany, the project contributed to the improvement of the heating advice element of the ElectricitySavingCheck, bolstering support for vulnerable households, with the regional Consumer Association keen to integrate the project's materials into their advisory services.

Greece incorporated the project's modified pilot policies into its national Action Plan for the Alleviation of Energy Poverty, innovatively addressing the split incentive issue and integrating tenants into the energy poverty assessment model. Italy's focus was on amplifying the issue of energy poverty within the "Italia in Classe A" program, with a commitment to maintaining the momentum in communication and training efforts post-project.

The Netherlands exemplified a tailored approach to energy advice delivery and the distribution of energy boxes. The project's research on the energy voucher program provided actionable insights for refining future energy poverty campaigns.

In summary, these contributions want to ensure that the impetus for energy efficiency and poverty reduction will persist, driving ongoing progress in the absence of direct EU support.

### **6.1.11 Number of influenced documents**

The ENPOR project has made a discernible impact on the policy landscape across its partner countries, influencing a variety of documents and statements from multiple policymakers:

- In Austria, the project's influence was documented in legislation, with the Energy Poverty Coordination Office being enshrined in the Federal Energy Efficiency Act of 2023.
- Croatia's engagement with the project resulted in four statements directed to both local and national authorities, including the city of Zagreb, the city of Križevci, and the Ministry of Economy and Sustainable Development, with further recipients being considered.
- Estonia saw the project's influence on a pivotal national policy document, the national renovation grant for buildings.
- In Germany, the policies' impact was manifested through the improvement of the heating advice element of the ElectricitySavingCheck, being rolled out to the 150 involved locations, and the Pre-paid app which, although not captured in legal documents, represent substantial project outcomes.
- Greece revised its Action Plan for the Alleviation of Energy Poverty to incorporate the project's modified pilot policies and insights from REACT group meetings, showcasing the

project's direct influence on national policy.

- In Italy, the policies' impact was more nuanced, focusing on enhancing communication and training initiatives, with local policymakers in Cosenza expressing interest in the project's outputs.
- The Netherlands' contribution to the project's impact through influences on policies include the consideration of energy poverty in the PRS as well as the promotion of the Energy Box and its methodology, stated within four documents from the Municipality of Utrecht and one from the Ministry of the Interior and Kingdom Relations.

The overall impact of the ENPOR policies is clear. It spans from direct legislative incorporation to the bolstering of programs and action plans, demonstrating a broad spectrum of influence on energy efficiency and poverty alleviation policies. While not all actions led to legislative changes in every partner country, the project's role in informing policy development and establishing best practices is unequivocally clear.

**Table 34: Documents influenced by ENPOR**

Disseminating Party	Description	Partner Responsible	Evidence
Resolution to mitigate energy poverty by Municipalities	Strategic recommendations on how energy poverty can be better addressed at the local/national/European levels in both English and German	CA	<a href="https://www.enpor.eu/04-10-22-press-release-cities-and-towns-set-example-in-the-fight-against-energy-poverty/">https://www.enpor.eu/04-10-22-press-release-cities-and-towns-set-example-in-the-fight-against-energy-poverty/</a>
Practice guide "Climate Protection in Municipalities" in German by the Federal Ministry of Economics and Climate Protection	Recommendations on policy alignment and best practices at a municipal level	CA	<a href="https://leitfaden.kommunaler-klimaschutz.de/">https://leitfaden.kommunaler-klimaschutz.de/</a>
Position paper on the draft law on the re-allocation of CO2 costs, submitted to the German Cabinet	Strategic recommendations on how energy poverty can be better addressed	CA, WI	<a href="https://www.enpor.eu/27-05-22-enpor-submits-policy-recommendation-to-the-draft-law-on-sharing-co2-costs-between-tenants-and-landlords-in-germany/">https://www.enpor.eu/27-05-22-enpor-submits-policy-recommendation-to-the-draft-law-on-sharing-co2-costs-between-tenants-and-landlords-in-germany/</a>
Energy Poverty Coordination Office enshrined in the Federal Energy Efficiency Act of 2023 by the Federal Ministry of Finance	Recommendations developed by the REACT Group were implemented by the Coordination Office, for example the development of targeted information formats for different target groups, the increased coordination of measures at national level and the promotion of training for advisors and mediators on energy issues.	AEA	<a href="https://www.ris.bka.gv.at/GeltendeFassung.wxe?Abfrage=Bundesnormen&amp;Gesetzesnummer=20008914">https://www.ris.bka.gv.at/GeltendeFassung.wxe?Abfrage=Bundesnormen&amp;Gesetzesnummer=20008914</a>
Social Energy Advice used by the Austrian Federal Ministry for Climate Protection, Environment, Energy, Mobility, Innovation and Technology and the Ministry of Social Affairs	Creation of target group-orientated information material for advising energy poor households on saving electricity, heating, cooling and saving water. The use of the developed information materials was recommended to improve the quality of energy advice, as they can be better used and be understood by the target group than conventional text-heavy material. Both the Ministry of Climate Action and the Ministry of Social Affairs are now using the materials in their funded advice sessions on energy issues for energy poor and low-income households.	AEA	<a href="https://www.enpor.eu/14-09-22-austrian-enpor-measures-in-the-energy-crisis/">https://www.enpor.eu/14-09-22-austrian-enpor-measures-in-the-energy-crisis/</a>
KredEx and Enterprise Estonia have merged into the Estonian Business and Innovation Agency. This is a foundation set up by the Ministry of Economic Affairs and Communications with the aim of providing financial solutions based on the best practices in the world.	The Estonian national renovation grant for buildings stipulates eligibility, and now ensures that renovation capacity itself should be a priority. Therefore, instead of repairing one roof or façade with the approval of an individual, the entire building should be renovated. The eligibility criteria includes: <ul style="list-style-type: none"> <li>• An apartment building with three or more apartments that has been in use before the year 2000.</li> </ul> At least 80% of the apartment properties in one apartment building are owned by natural persons.	TREA	<a href="https://kredex.ee/en/kodudkorda#kellele-sobib">https://kredex.ee/en/kodudkorda#kellele-sobib</a>

Ministry of Environment and Energy	<ul style="list-style-type: none"> <li>The modified pilot policies ("energy saving at home" programme and EEOs for awareness raising measure) have been included within the Action Plan for the Alleviation of Energy Poverty as resulted by the applied co-creation process. A specific reference has been added in Measure 4 of the action plan for promoting energy efficiency and RES technologies to energy poor households in the PRS ensuring the fair allocation of the delivered benefits between the tenant and the landlord. Moreover, the explanatory parameter "tenants" has been included within the logic model for quantifying the energy poverty levels.</li> </ul>	CRES	<a href="https://ypen.gov.gr/energeia/dimosievmeno-schedio-drasis-gia-tin-katapolemisi-tis-energeiakis-endeias-sdee/">https://ypen.gov.gr/energeia/dimosievmeno-schedio-drasis-gia-tin-katapolemisi-tis-energeiakis-endeias-sdee/</a>
Ministry of the Environment and Energy Security & ENEA	In the National Training and Information Programme on energy efficiency "Italia in Classe A", more space and visibility has been given to the issue of energy poverty in the PRS.	ENEA	<a href="https://italiainclassea.enea.it/">https://italiainclassea.enea.it/</a>
ENEA's Energy Efficiency Annual Report 2023 (RAEE)	<ul style="list-style-type: none"> <li>Recommendation related to ENPOR success stories and to the communication material developed by ENEA for ENPOR.</li> <li>Written input towards the Stakeholder consultation on the European Green Deal and Health, organised by the European Committee of the Regions.</li> <li>Parliamentary inquiry into Racism and Climate Change, All-Party Parliamentary Group (APPG) for Race and Community and APPG for the Green New Deal, House of Commons, 17th of October 2023.</li> <li>'Energy advice matters', Department for Levelling Up, Housing and Communities, 12th September 2022.</li> </ul>	ENEA	Link will only be available in December 2023
Ministry of the Interior and Kingdom Relations	<ul style="list-style-type: none"> <li>Energy Boxes are specifically mentioned as relevant and useful solutions for municipalities to make use of to fight energy poverty amongst house owners, social housing and in the PRS.</li> </ul>	HU	<a href="Bijlage-Toolkit-Aanpak-Energiearmoede-Knelpunten-en-oplossingsrichtingen.pdf">Bijlage-Toolkit-Aanpak-Energiearmoede-Knelpunten-en-oplossingsrichtingen.pdf</a>
Municipality of Utrecht	In this document, the following is mentioned: <ul style="list-style-type: none"> <li>An update on the number of Energy Boxes provided</li> <li>The set up of a 'hotline' where tenants can report their landlords</li> <li>Focus on door-to-door method for Energy Box - one of the ENPOR NL recommendations</li> </ul>	HU	<a href="https://utrecht.bestuurlijkeinformatie.nl/Rports/Document/f05b2e29-65b9-4bcc-b383-8315ce30b943?documentId=a4a9d8a5-8e7a-4274-9173-ea2eb4005c84">https://utrecht.bestuurlijkeinformatie.nl/Rports/Document/f05b2e29-65b9-4bcc-b383-8315ce30b943?documentId=a4a9d8a5-8e7a-4274-9173-ea2eb4005c84</a>
Municipality of Utrecht	In this document, the following is mentioned: <ul style="list-style-type: none"> <li>Special focus on student housing (often in the PRS)</li> <li>Broadening of Energy Box services (with implementation assistance; group advice in neighbourhoods; cooperation with social partners) - these are the ENPOR NL recommendations</li> <li>Set up of Energy Coalition (permanent cooperation) between Energy Box and other (social) partners - one of the ENPOR NL recommendations</li> </ul>	HU	<a href="https://utrecht.bestuurlijkeinformatie.nl/Rports/Document/0158172f-9535-4623-9255-62eb9ca72f8f?documentId=7de117bb-d812-4049-ad49-440d5a8b4c47">https://utrecht.bestuurlijkeinformatie.nl/Rports/Document/0158172f-9535-4623-9255-62eb9ca72f8f?documentId=7de117bb-d812-4049-ad49-440d5a8b4c47</a>
Municipality of Utrecht	<ul style="list-style-type: none"> <li>A special approach for PRS is being worked on and planned to be implemented in second half of 2023. In Dutch: "Een intensiveringsaanpak voor de particuliere verhuur volgt in het tweede kwartaal 2023".</li> </ul>	HU	<a href="https://www.armoedecoalitie-utrecht.nl/wp-content/uploads/2023/03/raadsbrief-aanpak-koopkracht-en-energiecrisis-februari2023.pdf">https://www.armoedecoalitie-utrecht.nl/wp-content/uploads/2023/03/raadsbrief-aanpak-koopkracht-en-energiecrisis-februari2023.pdf</a>
Municipality of Utrecht	In this document, the following is mentioned: <ul style="list-style-type: none"> <li>Specifically, that the group of PRS is often overlooked and that they are looking at taking specific measures for this target group. In Dutch: "Er zijn doelgroepen die tot nu toe buiten beeld blijven als het gaat om energie te besparen. Zo zijn er weinig instrumenten om de particuliere verhuurders aan te sporen om energemaatregelen aan de woning te nemen. De huurders kunnen de energiebox krijgen, maar het nemen van maatregelen aan een woning is afhankelijk van de bereidheid van de eigenaar. We denken na over opties om ook hier een versnelling te krijgen en komen daar later op terug. We willen niet</li> </ul>	HU	<a href="https://utrecht.bestuurlijkeinformatie.nl/Rports/Document/637eee68-33d1-4565-a1a7-5679289356b2?documentId=46fd9578-cc52-47db-b476-4326a0491a47">https://utrecht.bestuurlijkeinformatie.nl/Rports/Document/637eee68-33d1-4565-a1a7-5679289356b2?documentId=46fd9578-cc52-47db-b476-4326a0491a47</a>

	<p>wachten tot er in 2030 een verbod komt op het verhuren van woningen met een laag energielabel.”</p> <ul style="list-style-type: none"> <li>• Broadening of Energy Box services (with e.g. fixers) - one of the ENPOR NL recommendations</li> </ul>		
<p>Official memorandum/ statement by mail to Ministry of Spatial Planning, Construction and State Property</p>	<ul style="list-style-type: none"> <li>• The recommendations related to monitoring the impact of energy renovation measures in MAB and the tools that already exist to use them, different distribution of stakeholders who should work on EP (less focus on centers for social care but including utilities as partners) and excluding subsidies for the replacement of one fossil fuel heating system with another more efficient one should not be acceptable, taking into account that according to the Low Carbon Strategy of the Republic of Croatia.</li> </ul>	DOOR	<a href="https://mpgi.gov.hr/UserDocImages/dokumenti/EnergetskaUcinkovitost/Program_energetske_obnove_VS_zgrada_do_2030.pdf">https://mpgi.gov.hr/UserDocImages/dokumenti/EnergetskaUcinkovitost/Program_energetske_obnove_VS_zgrada_do_2030.pdf</a>
<p>Official memorandum/ statement by mail Ministry of Spatial Planning, Construction and State Property</p>	<p>The recommendations related to monitoring the impact of energy renovation measures in MAB which are mapped as buildings where energy-poor citizens live and the tools that already exist to use them.</p>	DOOR	<a href="https://mpgi.gov.hr/UserDocImages/dokumenti/EnergetskaUcinkovitost/Program_uzbijanja_energetskog_siromastva_do_2025.pdf">https://mpgi.gov.hr/UserDocImages/dokumenti/EnergetskaUcinkovitost/Program_uzbijanja_energetskog_siromastva_do_2025.pdf</a>
<p>Official memorandum/ statement by mail to the Office of the Ombudswoman - ombudswoman's report for 2022, data for energy poverty is requested - the report was submitted to the Croatian Parliament for adoption</p>	<p>The office of ombudswoman asked DOOR for data on energy poverty for 2022, and the data on energy poverty are included under the chapter "Right to adequate housing" (page 80), and energy poverty in PRS is mentioned and that DOOR implements research on that topic. The recommendations concern the long-term lease, legal relations regarding the ownership, and the increase in the amount of compensation for the vulnerable customer of energy.</p>	DOOR	<a href="https://www.ombudsman.hr/hr/download/izviesce-pucke-pravoraniteljice-za-2022-godinu/?wpdmdl=15489&amp;refresh=6465f2bc2565a1684402876">https://www.ombudsman.hr/hr/download/izviesce-pucke-pravoraniteljice-za-2022-godinu/?wpdmdl=15489&amp;refresh=6465f2bc2565a1684402876</a>

### 6.1.12 Number of households and or consumers impacted by the policy

During the duration of the ENPOR project, across the 7 different pilot countries, a total of **294,479** households were affected by the different policies.



## 7 CONCLUSION

Throughout the last 3 years, the ENPOR consortium has been hard at work to ensure that legislators, policy makers, energy experts, academics, as well as those susceptible to energy poverty could familiarise themselves with the concept of *energy poverty in the PRS*. The hardships, possible solutions, and methods for quantification of the issue have all been explored within the project, and therefore ENPOR has achieved its goal of setting the wheels in motion to alleviate energy poverty in the private rented sector. This can be seen by the impacts that have resulted from ENPOR's activities, in Table 35. Although the total primary energy savings triggered by the project as well as the number of households reached were lower than envisioned prior to the launch of the project due to ENPOR being carried out during the COVID-19 pandemic (thereby limiting outreach to target groups), as well as the inability to accurately monitor and measure energy reductions of behavioural measures (due to the nature of these policies), a significant amount of savings have been calculated and households have been reached, while more are expected in the future, due to the ENPOR policies being put into place. Using a number of quantification methodologies, ENPOR policies have been calculated to have surpassed the expected investments in energy retrofit, contributions to policy development and to best practice development on energy poverty, as well as reduction of greenhouse gases emissions, while achieving the KPI of the number of policies established. With all of this in mind, ENPOR is confident that further exploitation of the consortium's activities will continue to take place via the mechanisms, schemes, measures, and policies that have been established, along with the continued work of the partners to alleviate energy poverty as a whole, as well as within the private rented sector.

**Table 35: Project indicators before and after policy implementation**

Project Performance Indicator	Prediction within ENPOR (3 years)	Assessment within ENPOR (3 years)
Primary energy savings triggered by the project (GWh/year)	135.24 GWh/year Total = 405.72 GWh	51.53 GWh/year Total = 154.59 GWh
Investments in energy retrofit triggered by the project (million EUR)	58.8 million EUR	72.05 million EUR
Contributions to policy development and to best practice development on energy poverty (# of influenced document)	10	17
Policies established/adjusted for energy efficiency and/or small-scale renewable energy investments and to be sustained beyond the period of EU support (Number of schemes)	10	10
Involvement of consumers (# of households)	320,000	294,479
Reduction of greenhouse gases emissions (in ktCO <sub>2</sub> - eq/year)	19.5 ktCO <sub>2</sub> - eq/year	22.6 ktCO <sub>2</sub> - eq/year