ENPOR

Actions to Mitigate Energy Poverty
in the Private Rented Sector

Authors
Jen Heemann (IEECP),
Mara Oprea (IEECP),
Altan Sahin (AEA),
Edoardo Pandolfi (ENEA),
Anamari Majdandzic (DOOR),
Christos Tourkolias (CRES),
Marek Muiste (TREA),
Nanda Vrielink (HU),
Florin Vondung (WI)

D3.3 MONITORING FRAMEWORK

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1 INTRODUCTION

1.1 Objectives

A key ENPOR objectives is to support the set-up and implementation of 10 energy efficiency policies to alleviate energy poverty in the private rented sector (PRS) in seven Member States (MSs), namely Austria, Croatia, Estonia, Germany, Greece, Italy, and the Netherlands. ENPOR is currently going through a co-creation process of these policies with REACT Groups[1] in these countries, as presented in D3.1 and D4.1, to support the national and regional governments to adapt ten existing policies for the PRS. Following the policy design process, ENPOR will assist in the implementation of the policies in the MSs, for which more information can be found in D3.2.

This deliverable (D3.3) presents the monitoring methodology used in ENPOR to keep track of the **overall project's impacts** in terms of effectiveness of policies, number of policymakers and stakeholders influenced, energy savings and investments triggered, the **implementation and the impact of the ten policies**, and the outcomes of **capacity building activities**.

The monitoring framework presented aims to identify potential problems and ineffective design elements in the policies, ensuring early course correction and improvement. The monitoring process will also identify early successes and bottlenecks and communicate them to T3.1 to facilitate improvements as needed. The framework includes key performance indicators and simplified monitoring sheets to track the effectiveness of the policies and considers the EU Governance Regulation[2] & the Monitoring Mechanism Regulation (MMR), which foresee the monitoring of the energy poor levels including the number of the energy poor households and the reporting of the implemented policies for the alleviation of the energy poverty.

To monitor the success of the 10 proposed policies on the ENPOR households and property owners, a baseline and an outcome evaluation will be done, using collection methodologies detailed within this report. In this process, each partner in charge of ENPOR policies within their geographic areas are 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.

The monitoring data outlined within the first three points will feed into the Energy Poverty Dashboard (EPD), which will demonstrate the progress of the policies using a core set of KPIs. The outcomes will be validated in the last national meetings in each country, while the REACT groups will qualitatively assess the outcomes.

[1] 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.

[2] Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?toc=OJ:L:2018:328:TOC&uri=uriserv:OJ.L_.2018.328.01.0001.01.ENG

IEECP is responsible for monitoring the outcomes of the policies, the capacity building activities (WP4), and the overall project's impacts. Crucially, the partners CRES, UIPI, DOOR, TREA, ENEA, AEA, WI and HU are involved and will be responsible for:

- Identifying issues in the design of the policies in their respective countries (T3.1 and T3.2);
- Coordinating authorities to launch the policies in their country (T3.2);
- Reviewing and implementing the monitoring framework (T3.3); and
- Providing data on the policies' implementation to T3.3 for the monitoring process.

The main results from the monitoring process, including information on the triggered impacts and the design elements of the implemented policies, will be presented in D3.6 Monitoring outcomes final version, to be published in April 2023.

1.2 ENPOR Policies and workflow

The 10 policies currently being discussed and adapted through the REACT groups are presented in Table 1. The selection of the policies took into consideration their significant contribution to the alleviation of energy poverty until 2030. It was based on 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. They are clustered in a) Grants for building renovations, including fuel switch and small-scale renewables; b) Training & Information, Soft measures; and c) Programme support action, including guidelines to better identify energy poverty.

The policies will be implemented and assessed in a way that cross-comparisons can be made, and useful lessons can 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	Financial support scheme for thermal refurbishment measures for low-income households	AT
	National reconstruction grant	EE
	Energy upgrade of buildings (grant for renovation)	GR
	National Programme for Renovation of Buildings (grant for renovation)	HR
Training and information	Low-threshold, target group specific consulting (training and information)	AT
	Heating related energy advice (training and information)	DE
	Pre-paid metering app (training and information)	DE
	Training and Information Campaign	IT
Programme support	Energy Box (programme support)	NL
EEO	Energy Efficiency Obligation Scheme (EEOs)	GR

The interventions in the design and implementation of the ten energy efficiency policies are structured in four major steps (

Table 2) and depend on the maturity of the policies.

Table 2: ENPOR workflow of policies

Pilot policies: Steps	Description
Identification of groups (Step 0) 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 are identified. This data will be verified and completed as anonymized inputs to the EPD (in consultation with UIPI) within WP2 and WP3. In the identification of groups (step 0) we aim to segment private sector tenants, to the greatest extent possible, according to the length and security of tenancy agreements.
Design (Step 1) Support the set-up of policies	ENPOR will support MS by adapting ten existing policies according to the needs and capabilities of tenants and landlords as well as the implementing authorities. The policy intervention design will be informed by international experiences, a clear methodological framework for the PRS (WP2) and a detailed policy support design (T3.1).
Set-up launch intervention (Step 2) Activities directed at the setting up and implementation of policies specific to each target group.	ENPOR partners are 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 is foreseen for the coordinating authority so that the policies are secured to be realized (T3.2).
Monitoring (Step 3) Ex-ante evaluations will be carried out in line with a continuous monitoring of policies, both on household and programme levels.	The monitoring indicators developed in WP2 will be applied in T3.3. The outcomes of the implementation of these policies will be quantified in terms of the benefits they deliver. The indicators for alleviating energy poverty will disentangle effects such as rebound or structural effects and will inform the policy support actions of WP5.

The next chapter describes the monitoring framework and phases. The further chapters detail the monitoring methodologies and KPIs developed for the different project activities.

2 MONITORING FRAMEWORK

Monitoring and evaluation are a constant and important activity in the project. Proper monitoring ensures that potential issues are captured in advance so that there is enough time to correct our actions to enable the set impacts to be achieved. As such, the monitoring framework provides the means for determining if the policy developments in each country are on course to achieve the envisaged impacts.

There are two sets of monitoring activities in ENPOR, which are presented in Table 3.

Table 3: ENPOR Monitoring sets

Monitoring set	Description	Chapter
Short-term project impacts	Monitoring the project impacts in terms of effectiveness of policies as well as number of policymakers and stakeholders influenced. It includes monitoring of the capacity building activities and the Energy Poverty Dashboard.	Chapter 3
Policies (long-term) impacts	Monitoring energy saving, CO_2 reduction, investments triggered, energy poverty alleviation, and other factors related to the implementation of the ten policies. The monitoring also aims to identify potential problems, ineffective design elements and serves for early course correction. The monitoring process will also identify early successes and bottlenecks and communicate them to T3.1 (policies design) to facilitate improvements. It will include key performance indicators (based on T2.1 and T2.2) and simplified monitoring sheets. Many of the same KPIs will be applied to the monitoring of all policies; however, key metrics and parameters might be adjusted according to the police type and country context.	Chapter 4

The following chapters further describe the monitoring methods and indicators for each of the two monitoring sets. In both these sets, IEECP is responsible for developing the monitoring framework while considering the inputs and suggestions from consortium partners. This will serve to provide the necessary tools (e.g., survey links, excel sheets) for the data collection and monitoring activities, as well as to evaluate the monitoring outcomes and inform the partners. The partners responsible for the policies and/or implementing the capacity building and other activities will be responsible for collecting the necessary data and providing technical support for the effective monitoring and quantification of the impacts from the implementation of the policies.

Besides the monitoring sets, the monitoring framework also covers the process of development and implementation of the monitoring activities, which follows the three phases bellow:

Phase 1 – Definition of monitoring framework:

- Refinement of KPIs as defined in the Grant Agreement
- 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 (D3.3)

Phase 2 – Monitoring:

- Consistent monitoring and collection of data
- Monitoring 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 T3.1 (design of the policies), T3.2 (implementation of the policies), T4.2 (capacity building activities), and WP1 (project management).
- Continuous monitoring of policies' implementation

3 SHORT-TERM PROJECT IMPACTS

3.1 Expected short-term project impacts

The main target group of ENPOR is energy poor households in the PRS, which will receive support from ten policies to improve their energy and related monetary situation. ENPOR will directly and indirectly engage around 140,000 and 123,000 households respectively in countries outside of ENPOR's focus that can implement relevant policies in the PRS after the project's end. This wide outreach can provide clear and replicable cases that should drive change in energy poor households in the PRS.

As a means for monitoring the achievement of set goals, ENPOR partners, in close collaboration with the REACT groups, will provide input on the status of the desired outcomes. At least 2-4 of each partner's national and local governance bodies and up to 2-3 of EU governance bodies will 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 for target	Performance indicators	
		Output	Outcome
Contribution to policy development and to best practice development on energy poverty;	National half yearly REACT group meetings in 7 MS (21) physical and 20-30 online 3 yearly regional meetings in Zagreb, Vienna, Athens (WP4) 3 EU workshops (WP6) 5 Capacity building webinars (WP4) Webinar for EPD tool (WP2) and for validating policy outcomes (WP5) Policy recommendations (T5.2) Insights into policy development and success factors (WP2) Enabling ground for setting up policies (WP3)	Ten policies influenced At least 30 best practices developed and tested through REACT groups 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 fora	Out of 300 expected participants in national REACT workshops, 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 At least 25% adoption in national policy debates of recommendations
Policies established for energy efficiency and/or small-scale renewable energy investments and to be sustained beyond the period of EU funding	Influencing factors of policies for energy poverty Desktop research and input from REACT groups meeting 21 times physically, 20-30 times online, and 3 yearly regional meetings during ENPOR (WP2) Enabling the ground and launching policies (T3.1, T3.2) EPD (T2.2)	Ten policies established Adoption of the EPD outcomes and work by the EnR and Policy Forum Discussions on replication of the policies to at least 10 more cases (on	Out of 300 national participants at least 50% in each country to respond that they consider the planned policies to be realistic and achievable At least 75% of scheme implementers declaring by the end of ENPOR that they will continue their scheme

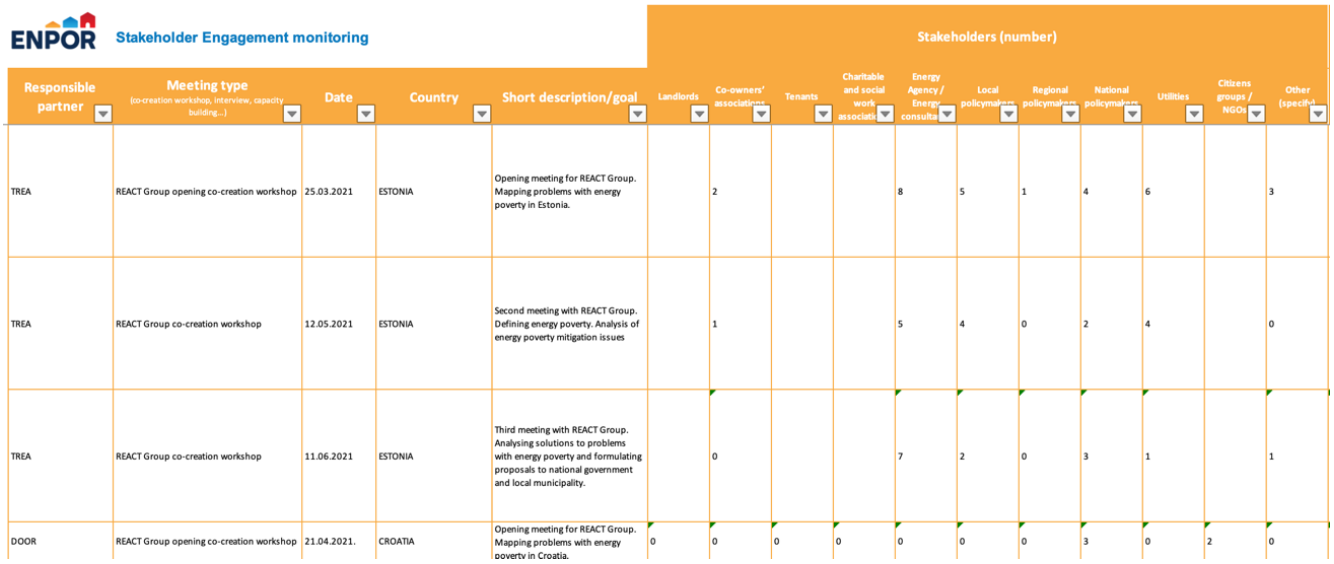
		national, regional or local level)	
Involvement of at least 5.000 consumers per million Euro of EU funding	Implementing policies in 7 MS reaching out to the numbers of consumers Energy Poverty Dashboard engages all target groups by: 1) Communicating information from WP2 to decision-makers and key stakeholders 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	Over 135,000 households involved in energy retrofits and other activities through the REACT groups participating in the 10 policies 10,000 households provide data (in the REACT meetings) through the ENPOR partners to customize their policies Ten policies involved originally in the tool and expanded during ENPOR 30 decision-makers used tool to inform policy or local decision-making 50 experts used tool in workshop	We expect 70% of policy makers to respond that they found policies applicable to their country context and 50% of households that use the tool to declare that they found out about new tools from the ENPOR project and related activities.

3.2 Monitoring methodology

The monitoring methodology includes the collection, documentation, and analysis of data for monitoring purposes. Data collection is realised by all national partners, through varied 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 fill in quantitative information related to the meetings and other stakeholder engagements, from REACT Groups workshops to bilateral calls. It is 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 used by all partners for documenting relevant qualitative and quantitative information about the meetings with stakeholders from the REACT Groups. All information gathered is 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 is accessible to the entire consortium, but mainly used by IEECP. It is constantly updated to keep track of the achievement of short-term project impacts.



ENPOR Stakeholder Engagement monitoring

Responsible partner	Meeting type (co-creation workshop, interview, capacity building...)	Date	Country	Short description/goal	Stakeholders (number)									
					Landlords	Co-owners' associations	Tenants	Charitable and social work associati	Energy Agency / Energy consulta	Local policymakers	Regional policymakers	National policymakers	Utilities	Citizens groups / NGOs	Other (specify)
TREA	REACT Group opening co-creation workshop	25.03.2021	ESTONIA	Opening meeting for REACT Group. Mapping problems with energy poverty in Estonia.		2			8	5	1	4	6		3
TREA	REACT Group co-creation workshop	12.05.2021	ESTONIA	Second meeting with REACT Group. Defining energy poverty. Analysis of energy poverty mitigation issues		1			5	4	0	2	4		0
TREA	REACT Group co-creation workshop	11.06.2021	ESTONIA	Third meeting with REACT Group. Analysing solutions to problems with energy poverty and formulating proposals to national government and local municipality.		0			7	2	0	3	1		1
DOOR	REACT Group opening co-creation workshop	21.04.2021.	CROATIA	Opening meeting for REACT Group. Mapping problems with energy poverty in Croatia.	0	0	0	0	0	0	0	3	0	2	0

Figure 1: ENPOR Stakeholder Engagement monitoring file

The files support the documentation of relevant data for monitoring purposes. Based on the performance indicators presented in Table 4, the set of indicators and source of data is showed on the table below.

Table 5: Short-term project impacts indicators and data source

INDICATORS	TARGET	MONITORING METHOD OR DATA SOURCE
N of policies influenced	10 policies	REACT Groups meetings
Policymakers (n) in REACT groups	5 per country	REACT Groups - Stakeholder Engagement Monitoring file
Workshops contribute to policymaker's work with combating energy poverty	70% of policymakers	Satisfaction Survey Bilateral meetings with stakeholders
N of best practices developed and tested through REACT groups	At least 30	REACT Groups - REACT Meeting minutes (main conclusions and recommendations, forms for events, workshops) N of proposed measures incorporated by the end of the project
Best practices adoption	At least 25% adoption in national policy	REACT Groups - REACT Meeting minutes Documents
Contribution to policy development	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 fora	Data collected in 3 EU workshops (WP6)

Households (n) involved in ENPOR policies	Over 135,000 households involved in energy retrofits and other activities through the REACT groups participating in the 10 policies	Bilateral interviews with REACT members to report status on the field
EPD use	50% of households that use the tool to declare that they found out about the new tools via ENPOR-related activities. 70% of policymakers to respond that they found policies applicable to their country context.	Online survey for EPD

The monitoring files with information about the REACT Groups are considered as data sources for monitoring activities. However, data is also collected through monitoring methods such as:

- **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.
- **Literature review and observation**: For collecting statements from policy makers or national policy legislative documents.
- **Survey with REACT Groups:** To assess if the REACT Groups participants consider the planned policies to be realistic and achievable, as well as their satisfaction with the entire co-creation process.
- **Monthly WP3 meetings**: in which each national partner reports the status of the policy co-creation process, potential challenges and solutions to overcome such challenges.

4
POLICIES & LONG-TERM IMPACTS

4.1 Estimated impacts on energy savings, investments, and CO_2 emission reduction

To calculate total energy savings, there is a distinction made between savings generated by the ENPOR policies directly and savings from 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 in order to calculate the delivered impacts. To this direction, the methodological framework of the multEE project[3] 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), while in other cases that target renovation the country average floorspaces per households are included. For the informational measures, the final energy is low as the behavioural change enhanced by the training (i. This could imply a "positive rebound effect" for example, in terms of higher heating expenditure. In this way, households could increase their comfort and even grow out of their energy poverty condition.

Table 6: Impacts from the ENPOR policies

Relevant expected impacts	Households	Savings (GWh)	Assumptions	Other effects
Pre-paid metering app (DE)	9,800	3.53[4]	2700 kWh[5], 10% savings and 50% affected	€0.44 ME cost savings = (3.52*0.35)
Heat energy advice (DE)	500	0.45[6]	10.500 kWh[7], 10% savings and 50% affected	0.03 ME cost savings = (300,000*8.08[8])
Ecobonus with soft measures (IT)	200	3	3.5 GWh[9], 2% savings and 20% affected	0.37 m€ cost savings (final energy savings * energy price)

[3] https://multee.eu/
[4] Calculated using a primary energy factor of 2.8 for the German power mix. 34 Average yearly electricity consumption of households supplied by EnergieRevolte.
[5] Average yearly electricity consumption of households supplied by EnergieRevolte
[6] 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.
[7] Energy poor household heat energy consumption for a 70m2 dwelling assuming an average energy demand of 150 kWh/m2/a.
[8] Weighted price for one kWh of heat energy considering the share of different energy carriers for heating in Germany.
[9] 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)

Target Group consulting (AT)	500	0.10	225kWh/m/a[10], 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)
Energy upgrade (HR)	1,470	22.04	200 kWh/m2[11], 75m2 average flat size	110,218 m2 renovations (75m2*households)
National reconstruction grant (EE)	5,000	0.59	3.9[12], 5% affected and 30% savings	8,500 m2 renovations (1700m2*5 buildings)
Energy Efficiency Obligations (GR)	100,000[13]	23.23	7955kWh[14], 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/m2, 80m2 average flat size[15]	800,000 m2 renovations (80m2*households)
Energiebox (NL)	5,000[16]	10[17]	10% savings	0.76 million € cost savings[18]
Total	**137,470**	**135.24**		

For ENPOR as a whole, the maximum primary energy savings triggered from the ten policies, using the same assumptions in PRS households in the EU-28, could be 135.24 GWh/year (reaching a cumulative 270.48 GWh during the project, considering that the policies would have been in place

[10] 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)

[11]http://www.gskg.hr/UserDocsImages/Energetska%20obnova/Energetska%20u%C4%8Dinkovitost%20zgrada/Program%20ener getske%20obnove.pdf

[12]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)

[13] 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

[14] Average final energy consumption of a Greek household transformed in primary energy according to the proposed methodology in NEEAP of 2014 (Eurostat 2015).

[15] The values are also comparable to the results of the "Energy Savings at Home" program since similar energy efficiency interventions will be financed.

[16] 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)

[17] 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.

[18] Costs savings on reduced energy bill per household (151 € with 5,000 households)

for only two years). As described above, we estimate ENPOR policies to directly influence 137,470 dwellings during its duration or around 320,000 consumers (with an average size of 2.3 persons/household[19]).

ENPOR can also reach out to additional energy poor households in the PRS indirectly in the longer run through dissemination channels and EU outreach. To approximate this number, there are 220 million households in the EU[20] 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[21]. Approximately 11% of households in the private sector (10.6% owner-occupiers, 11.2% market rent levels) are unable to keep their home adequately warm[22].

In relevant policies for energy poverty, the average response rate can reach 0.8%[23] and ENPOR can thus indirectly reach 197,120 additional households (220 million households*11.2%*0.8%) or 450,000 consumers. Given the average energy consumption per dwelling (16,165kWh - ODYSEE), the overall indirect effect (with 2% savings due to soft measures from relevant policies) can lead to 63.7 GWh per year energy savings, equating to 191.2 GWh/year for 3 years after ENPOR (which only reflects the lifetime of behavioural measures).

To calculate CO_2 savings, we use EUROSTAT data for 2015 with a conversion rate of 1.5 from primary to final energy consumption as well as the Odyssee-Mure data per EU MS on tCO_2 for households24 (2015), which amounts to 704.9MtCO_2. Based on this, the ktnCO_2/GWh from households is 0.218 (dividing the aforementioned number with the total Final Energy Savings of all households in the EU)[25]. Thus, we estimate that the total expected impact by the ten pilot policies of 135.24GWh can lead to 19.5 ktCO_2 reduction per year over the project's duration, and 9.2 ktCO_2 5 years after the project's end.

In regards to the investments for energy retrofits, the direct impacts of ENPOR policies can lead to 980,000 m^2 of retrofits with an average modest investment cost of 60 EUR/m^2 [26] can lead to €58.8M in investments. In the long run, we do not expect an increase in the investment amount as mainly softer measures will be applied within the project.

[19] EU average household size in 2016: 2,3
http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=ilc_lvph01&lang=en
[20] https://www.euronews.com/2017/09/05/people-living-alone-europe-solo-living
[21] https://ec.europa.eu/eurostat/statistics-explained/index.php/Housing_statistics#Type_of_dwelling
[22]https://www.energypoverty.eu/indicator?primaryId=1461&type=bar&from=2016&to=2016&countries=EU&disaggregation=ten
[23] 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).
[24] A CO_2 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.
[25] 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 ktnCO2/GWh (0.218) from households.
[26] http://www.europarl.europa.eu/RegData/etudes/STUD/2016/587326/IPOL_STU(2016)587326_EN.pdf

Table 7: 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_2- eq/year)	19.5	9.2	$ktCO_2$- eq/year
Energiebox (NL)	5,000[27]	10[28]	10% savings

The indicators below have been chosen to measure ENPOR's impact most effectively throughout the MS, with *Primary energy savings triggered by the project*, *Reduction of greenhouse gases emissions (in tCO_2- eq/year)*, *Number of influenced documents - Statements from policy makers or national policy legislative documents* and *Number of households impacted by the policy* used across most project countries.

Table 8: Project indicators being used

Project Performance Indicator	AT	HR	EE	DE	GR	IT	NL
Primary energy savings triggered by the project	X	X	X	X	X	X	X
Investments in energy retrofit triggered by the project			X	X	X	X	
Reduction of greenhouse gases emissions (in tCO_2- eq/year)	X	X	X	X	X	X	X
Number of influenced documents - Statements from policy makers or national policy legislative documents	X	X	X	X			
Number of households impacted by the policy	X	X	X	X			X
Consensual-based indicator (ability to keep home adequately warm/cold)		X					
Arrears on utility bills		X					
Faulty housing		X					
Expenditure-based indicators (lihc/hac)		X					
Energy prices		X					
Number of energy poverty indicators used for grant applications			X				
Improved comfort levels/well-being of advised households				X		X	

[27] 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)

[28] 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.

Sustainable knowledge transfer/application by advised households				X			
10% savings						X	
Number of households that experience energy poverty impacted by the policy					X		X
					X		

4.2 Overall monitoring methodology

In order to keep track of the achievement of such impacts, the implementation of the policies will be closely monitored. Therefore, the monitoring of the policies' impacts has three main objectives:

1. To monitor the long-term impacts explained before
2. To monitor the energy poverty alleviation
3. To monitor policies implementation for identification of potential problems, ineffective design elements and for early course correction. The monitoring process also identifies early successes and bottlenecks and communicates them to T3.1 (policies design) to facilitate improvements.

The monitoring methodology includes key performance indicators (based on T2.1 and T2.2 and presented before) and simplified monitoring sheets. Overall, the implementation of the policies is going to be monitored as follows:

- **Monthly WP3 meetings**: Each national partner will report the status of implementation of the policies, potential challenges (e.g., related to collecting data and information), and discuss 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 are needed for surveys, for example, these will be done by IEECP with the collaboration of the national partners.
- **Questionnaire surveys:** For the ENPOR households and property owners, there will be a baseline and an outcome evaluation (before-after-comparison) based on questionnaire surveys (half yearly), which are an integral part of on-site activities such as energy consulting, funding applications or technical installations.
- **Best practice template:** Created by IEECP and filled out by the national partners to document successful measures and approaches that can be used in other countries as well as by other 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.

In this process, each ENPOR partner responsible for policies will also be 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 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.

We recognise the risk that the monitoring of energy savings by way of theoretical savings in kWh would not adequately reflect the effectiveness of the interventions as an intrinsic risk of all schemes that promote energy efficiency and calculate energy savings on theoretical values. Actual measurement of savings through monitoring energy consumption would of course increase the reliability of the assumptions made. Yet, their implementation cannot be guaranteed (due to cost, unwillingness to install monitoring system, etc.) although project partners will try to gather information based on energy bill pre and post renovation (in a representative sample of 20% if the target group is large as indicated in the impacts section). In the cases where energy providers are responsible for the action (e.g., under EEOs) they will provide their own data from their customers.

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

5 MONITORING METHODOLOGIES PER COUNTRY

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 private rented sector is largely dependent on factors that are outside the tenants' direct sphere of influence (e.g. thermal condition of the building). Nevertheless, the tenants themselves have the opportunity to improve their own living situation, at least to a certain extent. Therefore, the need for solutions for energy poor households to be easy to implement and to be cheap, is an important basis for the elaboration and implementation of this measure to reduce their energy consumption or energy costs. Many energy poor people already save energy, but often try to do so by sacrificing living comfort. This can also be counteracted by selecting suitable measures.

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

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 new versions within the framework of ENPOR. However, these materials are intended to stand out from previous offers at this level by placing a clear focus on figurative language and thus offering a clear advantage for this hard-to-reach target group by conveying information with as few words as possible and a clear focus on illustrations and pictograms. This serves the purpose of making it easier to overcome linguistic hurdles or hurdles resulting from a lack of background knowledge.

In the target region of Vienna, support services for low-income households are already offered. These services range from on-site consultations to various information materials. However, the existing information and support formats are often not prepared in a suitable form, as this target group often does not have the time, resources and educational background to deal with sophisticated tools and detailed materials, while usually energy poor households are not specifically targeted either.

The added value of this measure is therefore not that more counselling sessions are carried out, but that already existing counselling services can be made more target group-oriented and thus achieve a higher impact.

5.1.1.2 Financial support scheme for thermal refurbishment measures for low-income households

A support volume of 100 million Euro in 2021 and 2022 as part of the comprehensive renovation offensive currently being implemented by the Austrian government is intended to enable low-income households to cope with additional burdens arising from the implementation of renovation investments in the building sector eligible for funding under support programmes, thus reducing investment barriers in this segment of the population. The European Union's Recovery and Resilience Facility will also make additional funds available, part of which will be used specifically to support energy poor households in Austria. The exact form of this is currently still being determined. In this context, the Austrian Energy Agency is currently in consultation with the Ministry for Climate Protection to determine what contribution ENPOR could make to support these new offers and to possibly enable a targeted focus on the private rental sector. This will then be designed and implemented as a further process with its own smaller REACT group, with the Ministry as the central contact. The process on how each measure was adapted through the REACT groups is still to take place.

As this is a federal measure to be supported by the project, the assessment of the impact is expected to be based on data on the uptake of the new funding provided by the responsible ministry.

5.1.2 Data collection and monitoring methods

A direct quantitative assessment of the impact is not possible, but a qualitative evaluation of the new materials by energy poor households is planned. This involvement is crucial to ensure the development of targeted interventions that meet their needs and challenges. The developed materials will be 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 will enable an evaluation process that ensures that the contents developed are clear, comprehensible and also of a relevant nature for affected households. There the households will be asked for their feedback on the materials themselves. This will enable us to find out directly from those affected by energy poverty how they rate the comprehensibility and relevance of the new information sheets. The agency evaluates the feedback and, if necessary, revises the materials in cooperation with the graphic designer. This process enables a qualitative estimation of the impact per household. By making the developed materials freely available and disseminating them nationwide to various social organisations, long-term use and a sustainable effect will be ensured.

After the implementation of the measure, the number of households advised with the materials can be communicated directly by DIE UMWELTBERATUNG. Based on this information, estimates of further effects (energy savings, etc.) can be made. A further impact assessment is made on the basis of the stakeholders reached who have agreed to use the materials in their advisory services or communication. Based on information about their activities, another quantitative estimate of the impacts achieved will be made, similar to the impact assessment for the ENPOR project.

Table 9: Austria's 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 DIE UMWELTBERATUNG on the number of advised households
Number of influenced documents - Statements from policy makers or national policy legislative documents	Can 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 can be obtained directly from DIE UMWELTBERATUNG	Direct information from DIE UMWELTBERATUNG
Reduction of greenhouse gases emissions (in tCO2- 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 DIE UMWELTBERATUNG on the number of advised households

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

National Programme for Renovation of Buildings for the period 2014-2020 aims to undertake renovation activities, ensuring that part of benefited households are those experiencing energy poverty. The program is implemented through 4 programs but our focus is on the following 2 main programs:

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 for to finance the energy renovation of family houses for vulnerable groups of citizens at risk of energy poverty*) where 20% of the total funds (28.4 million HRK = 3.79 million EUR) were set aside for vulnerable group of citizens.
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 programs, although our focus is on the following 2 programs:

1. Energy renovation programme for multi-apartment buildings
2. Energy renovation programme for single family houses – as part of this program there will be Program 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 group of citizens and citizens at risk of energy. The intention is to develop better criteria for the next Public Call, while improvements (criteria) to this policy were discussed. This does not mean that these measures do not help in alleviation of energy poverty in the private-rented sector. 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 can be encouraged and thus contribute to alleviating energy poverty of tenants in private-rented sector.

The integration of specific measures and criteria related to the private-rented sector remained an open question for the next meetings. Conclusions from the meeting included:

- The problems include 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 are critical for the conformation of energy poverty in private-rented sector.
- The integration of specific measures and criteria will be considered as option to alleviate energy poverty in the private rented sector.

The **first TARGET group** involved more discussion of the positive and negative sides of the Program as well as Public calls within the Program from the point of view of applicants and beneficiaries of this Program. The area of Buševac is quite small and as such, the classic private-rented sector does not exist. Due to unresolved property-legal relations there is the presence of a so-called free – based tenancy, which always includes two separate families/households in the same dwelling and where extended families living in a joint household.

As part of the BušEko? Project[29], an energy poverty survey was conducted in the area of Buševac (150 completed questionnaires) by DOOR and OSS Buševac and detailed data on energy poverty, energy consumption and private rented sector will be gathered. As in other suburban areas extended families who are living in a joint household were present in Buševec area as well, thus it is difficult to determine the real private rented sector situation.

The conclusions of first TARGET group meeting include:

- There is interest in the Program and Public calls, but most citizens are concerned about complicated administrative paperwork and application pricesses.
- More systematic education about energy poverty and alleviating energy poverty in private-rented sector for citizens should be conducted.
- After the analysis of the survey, the obtained data can be used for further action on the alleviation of energy poverty in the area of Buševec.

The **second REACT group** involved more discussion on the positive and negative sides of the Program and Public calls within the Program from the point of view of applicants and beneficiaries of these Program. During the discussion, different problems were identified in the urban and rural part of the city of Križevci. In the urban part of the city of Križevci, an unregulated market and unresolved property-legal relations contribute to the problem of lack of national data and the market operating in the shadow zone. In the suburban and rural parts of the city of Križevci, the classic private-rented sector also doesn't exit and is replaced by free – based tenancy, which always include two separate families/households in the same building creating the situation where extended families live in a joint household, while in some cases three generations and their relatives co-exist as well.

As part of the POWERPOOR project[30], an energy poverty survey will be conducted in Križevci (where approximately 220 direct households will be visited) by DOOR and detailed data on the situation regarding energy poverty for the area will be obtained. Among other indicators, energy poverty indicators for rental sector will be gathered and analysed.

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

The focus of the **third REACT group** was also focused on the discussion of positive and negative sides of the Program and Public calls within the Program from the point of view of applicants and beneficiaries of these Program. During the discussion, different problems were identified in the urban and rural part of the city of Zadar and Zadar county. In urban part of city of Zadar an unregulated market, unresolved property-legal relations and postponing complete renovation of the building and passing the problem on to future heirs contribute to the problem of lack of national data and the market operating in the shadow zone. In the suburban and rural parts of city of Zadar and Zadar 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

[29] https://door.hr/portfolio/bus-eko/
[30] https://powerpoor.eu/

footage, and now 20 or so years after post-war reconstruction, the houses still have no facade, thermal insulation or complete infrastructure such as sewerage, water supply and access to electricity. As such, the classic private-rented sector also does not exist here.

As part of the EmpowerMed project[31] an energy poverty survey will be conducted in the area of city of Zadar and Zadar County (approximately 200 direct households will be visited) by DOOR in cooperation with Red Cross – Zadar and detailed data on the situation regarding energy poverty for the area will be 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 include:

- There is interest in the Program and Public calls, but most citizens are 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 can be 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 3 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 3 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 for to finance the energy renovation of family houses for vulnerable groups of citizens at risk of energy poverty) which was published in 2020. The Public calls which contribute to some uncertainties and reluctance about the funding among the beneficiaries were open in 2015 and 2020 and are shown in 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 tCO2- eq/year)
2015	Programme of energy renovation of **family houses** 2014 – 2020	Public Call for all citizens	9200*	N/D	194,48 GWh***	28.591,66 tCO2***
2015	Programme of energy renovation of **multi-apartment buildings** 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 **family houses** 2014 – 2020	Public Call for all citizens	3100**	210.900.000,00 HRK (~27.750.000,00 EUR)	9,51***	3.141,89 tCO2***
2020	Programme of energy renovation of **family houses** 2014 – 2020	Public call for citizens at **risk of energy poverty** for to finance the	N/D	32.000.000,00 HRK (~4.210.500,00 EUR)	1,75***	

[31] https://www.empowermed.eu/

		energy renovation of family houses for vulnerable groups of citizens at risk of energy poverty				

* 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 Program 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 require the provision of additional funding to co-finance energy renovation projects for buildings.

Financial resources for the implementation of this Program in the total amount of HRK 400 million (~52,630.000,00 EUR) are in the Financial Plan of the Environmental Protection and Energy Efficiency Fund for 2021 and projections for 2022 and 2023. According to the Plan, funds are ensured for the 2021 and 2022 period but not for 2023. The Fund predicts that HRK 121 million (~15.921.000,00 EUR) will be secured by the distribution of surplus revenue in 2021 and will be probably allocated to 2023 and thus the total amount of HRK 400 million (~52,630.000,00 EUR) for the period 2021-2023 will be achieved as it shown in table below.

It should also be emphasized criteria of damage of the house in the earthquake will be taken into account when allocating funds of HRK 400 million (~52,630.000,00 EUR):

- HRK 300 million (~39,474.000,00 EUR) is 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 (~13,158.000,00 EUR is 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, ie in parallel with the same

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 tCO2-eq/year)
2021	Programme of energy renovation of **family houses***	Public Call for all citizens	TBD	185.000.000,00 HRK (~24.345.000,00 EUR)	N/D	N/D
2022	Programme of energy renovation of **family houses****	TBA	TBD	50.000.000,00 HRK (~6.580.000,00 EUR)	N/D	N/D
2023	TBA	TBA	TBD	121.000.000,00 HRK (~15.921.000,00 EUR)	N/D	N/D
	Total	-	TBD	400.000.000,00 HRK (~52,630.000,00 EUR)	56 GWh	14.500,00 tCO_2

*The public call will be a combined Public call of 2 programs in the amount of HRK 209 million (~28 million EUR)

of which **HRK 185 million (~24 million EUR) on activities K200035 Family house renovation** program 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 Public call of 2 programs in 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 we will keep track of:

- **Dynamics of publishing public calls**
- **Type of program** (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_2- eq/year)**

DOOR will write a report on the results of the National Programme for Renovation of Buildings for the period 2014-2020 and report on 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 will show both the results of the 2014-2020 period programme and expectations from 2021-2027 programme and it will try 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
			ENPOR period 2021-2023
Dynamics of publishing public calls	2014	No	
	2015	Yes	
	2016	No	
	2017	No	
	2018	No	
	2019	No	
	2020	Yes	
	2021		Monitoring in progress
	2022		Monitoring in progress
	2023		Monitoring in progress
	2024		
	2025		
	2026		

	2027		
Type of program	Programme of energy renovation of family houses 2014 – 2020	3	Monitoring in progress
	Programme of energy renovation of multi-apartment buildings	1	Monitoring in progress
Type of Calls	Public calls for all households	3	Monitoring in progress
	Public calls for energy-poor households	1	Monitoring in progress
Amount of funds		N/D	400.000.000,00 HRK (~52,630.000,00 EUR)
Number of households covered by the Call		762 397	Monitoring in progress
Primary energy savings (GWh/year)		N/D	56 GWh
Reduction of greenhouse gases emissions (in tCO_2-eq/year)		N/D	14.500,00 tCO_2

5.2.2 Data collection and monitoring methods

The Ministry of Physical Planning, Construction and State Property and Environmental Protection and Energy Efficiency Fund are in charge of the implementation of these programs and are also obliged to make reports on the success of the Program and present them to the public. Data collected will be primary energy savings (GWh/year), investments in energy retrofit (million EUR), number of influenced documents (statements from policy makers or national policy legislative documents), and number of households impacted by the policy and reduction of greenhouse gases emissions (in tCO_2-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 will be used within a national survey developed by DOOR which will include data on energy poverty in the rental sector as well along with broader set of national data on energy poverty.

Data collection will occur through the research of published data by the authorities responsible for the implementation of the Program (Ministry of Physical Planning, Construction and State Property and Environmental Protection and Energy Efficiency Fund).

Data collection through a small scale of survey about property ownership will take place to get information about the classic private-rented sector. By carefully designing questions, we can get 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 D4.1 will occur 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 will be organized through various forms of events such as meetings, info days, workshops, round tables and so on. By involving all stakeholders, we hope that the period of implementation of the Program 2021-2023 will be more successful than the period of the Program 2014-2020 in the number and dynamics of opening public calls, in number of type of program, 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_2- 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	https://www.fzoeu.hr/ https://mpgi.gov.hr/
Investments in energy retrofit (million EUR)	official reports of the Fund and Ministry	https://www.fzoeu.hr/ https://mpgi.gov.hr
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	https://www.fzoeu.hr/ https://mpgi.gov.hr
Reduction of greenhouse gases emissions (in tCO_2- eq/year)	official reports of the Fund and Ministry	https://www.fzoeu.hr/ https://mpgi.gov.hr
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

5.3 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 1114 buildings that reduced CO_2 emissions by 140 000 tons and has been a good example as a public initiative on 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 co-creation process with the REACT group:

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 facade to improve the whole building.
1.2. Boosting the full renovation of historic buildings.

Measure 2. Increasing the capacity of the parties for participating in the renovation process, including:
2.1. Increasing the role of tenants in the apartment building renovation process and including them into the decision-making process together with the owner of the rental 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-native speaking region Ida-Virumaa. 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.

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 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 national renovation grant to energy poverty.
3.4. Supporting only the full renovation of apartment building 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.

Measure 4. Increasing renovation capacity in the City of Tartu by:
4.1. Developing major district-based renovation project 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 district of Annelinn.
4.3. Establishing a full package renovation consulting service in Tartu (aka 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 initiated 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 rental market and prevent their negative impact.

The national renovation grant has been identified by the legislator as one of the policies for reducing energy poverty. However, we see that the implementation of the grant does not address energy poverty directly nor does it take into the consideration some of the more specific problems of energy poverty of the households (including hidden energy poverty, poverty in rented households etc). To reduce the living costs and improve the life quality of the target group, TREA will evaluate, improve and monitor the national reconstruction grant used for the deep refurbishment of rented apartment buildings. TREA will increase the capacity of policy makers for understanding the negative effects of energy poverty and address these in 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 will emerge from the work of the REACT group and will touch upon social aspects, financial aspects (low real-estate value), demographics, geographical, infrastructure and others. The improvements will be discussed with the policy maker (Estonian Ministry of Economic Affairs and Communication) and will be tested in the City of Tartu during the ENPOR project. TREA will support the associations of tenants and landlords during and after the refurbishment by providing technical expertise, negotiating with service providers, monitoring consumption, educating tenants on everyday energy saving measures, etc.

4.3.2 Data collection and monitoring methods

Data will be collected at the national level yearly from the national grant holder concerning the number of households influenced by the renovation programme. REACT group meetings provide 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 will be developed using the data from the grant holder and analysed by the experts of TREA.

Additional analysis will be done as an outcome of regular policy monitoring using the national online platform. The monitoring will target the implementation of the concept of energy poverty in renovation policy and other related areas. Representations of energy poverty in policy documents will emphasize the wider importance of the topic.

Table 14: 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_2- eq/year)	Emission analysis	National statistics
Number of energy poverty indicators used for grant applications	Data inquiry	National statistics

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 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 focuses on electricity savings, but has also started to extend its activities to heating related advice in some locations. The aim of ENPOR is 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 will be developed, tested and evaluated. A particular challenge here is the lack of immediate financial incentives for the majority of 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 monitor impacts of the heating advice and b) increase its effectiveness. As a result, the decision was made to put more emphasis on comfort and to some extent health benefits within the communication and to support and strengthen the consulting contents through visual aids, of which parts enable better understanding and self-experience of proper room ventilation on indoor climate and others act as reminders for adapted heating and ventilation practices. Furthermore, the provision of additional immediate low-tech aids (e.g., sealing strip, draught excluders) is amended by a shower hourglass for households to better monitor their hot water consumption. It is 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 behavior 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 is difficult 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 lack 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 can be used. As regards the number of households receiving heating advice, figures prior to the introduction of a more standardised address of the subject can be considered a baseline for monitoring the project impact. Lastly, regarding comfort levels and wellbeing, a baseline can be constructed using responses on respective questions prior to the implementation of advised measures.

5.4.1.2 Prepaid metering app

EnergieRevolte 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 consumption information is transmitted every 15 minutes. About 1,200 customers are using the app currently, 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 will be 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 will make use of different data collection methods and data sources and will be implemented in three steps. As a first step, in the second household visit (taking place a week after the first visit) advised households will be asked about their experience with and assessment of the provided information tools. Questions will aim 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 will be noted and fed into the central data base. At this occasion, also the following monitoring activities will be announced. A second data collection step to assess the short-term impact will be implemented via a questionnaire-supported telephone call three months after the second household visit. Within the call, the households will be 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 and meters will be asked about the existence of a new heating bill. Lastly, in order to collect information on the long-term impacts of the new heating advice approach, another on-site visit of the households will be implemented a year after the first one or as soon as a new heating bill is available.

Table 15: 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_2-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

5.5 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 the 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, foresees the inclusion of the tenants as a distinct social criterion, while the provided public aid must be calculated taking into account the shared benefits among landlords and tenants.

According to the proposed design of the recently announced "Energy upgrade of buildings" programme, a specialised benchmarking system will be 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 is comprised of the existence of long-term unemployed members, disabled members, children and single-parent families. It should be noted that a specific weight will be assigned to each criterion in order 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 will be 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 the Energy Poverty in Greece.

The baseline for the case of the "Energy upgrade of buildings" programme will be determined taking into consideration the rented-buildings, which were renovated or approved for financing within the framework of the "Exoikonomo-Autonomo" program. The percentage of the supported households, which dwell in rented-buildings, will be estimated taking into account the total number of households that participated in the program in order to facilitate the comparative analysis with the planned "Energy upgrade of buildings" programme. Moreover, additional information will be collected, such as the foreseen investments and the income of the participated households in the implemented program.

5.5.1.2 The Energy Efficiency Obligation Scheme

The Energy Efficiency Obligation Scheme (EEOs) constitutes the second pilot policy in Greece. The EEOs started in 2017 imposing an obligation to achieve a specific target through energy efficiency interventions. The conduction of energy efficiency interventions to energy poor households is also foreseen. The EEOs will 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 in regards to the split incentive problem into the Action Plan for the Confrontation of the Energy Poverty within the measure M4, which refers to the energy upgrade of the energy poor households' buildings in the period 2021-2030. Correspondingly, the proposal for the case of the EEOs foresees the conduction of targeted information and awareness-raising activities by the energy suppliers providing useful and effective guidance to energy poor households, which dwell in rented-buildings, so as to combat the phenomenon of energy poverty. Specialised information material and interactive tools will be utilised providing recommendations for the effective alleviation of energy poverty, while dedicated training programmes will also be organised aiming at the enhancement of the current knowledge of the energy poor households. Finally, the conduction of simplified energy audits will foster the identification of the most cost-effective energy efficiency interventions facilitating the achievement of 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 will be considered equal to zero due to the fact that no targeted awareness raising measure has been initiated for combating energy poverty in the private-rented sector. 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 in regards to the effective alleviation of the energy poverty in the private-rented sector.

5.5.2 Data collection and monitoring methods

The required data for the case of the "Energy upgrade of buildings" programme will be provided by the authority, which will be responsible for the coordination and administration of the program. The provided data will include the number of the affected energy poor households and the foreseen investments that will be approved by the program. It should be noted that the respective data will be collected for all of the approved applications in order to facilitate the comparative analysis with the baseline. Moreover, the expected primary energy savings and the foreseen CO_2 reduction will be 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 will be provided by the PPC SA, which plans to implement a targeted awareness-raising measure for energy poor households in the private-rented sector. The provided data regarding the affected energy poor households will be 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) will be calculated according to the measurement protocol of the scheme.

Finally, a qualitative assessment of the effectiveness of both the adapted pilot policies will be conducted by the REACT groups identifying the potential barriers and proposals for further.

Table 16: The Greek data collection method for the case the "Energy upgrade of buildings" programme

Project Performance Indicator	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_2-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 17: The Greek data collection method for the case of the EEOS

Project Performance Indicator	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_2- 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

5.6 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 Program

A national program 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, envisaged 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.

Currently a new national EE program for information and training actions is foreseen with Legislative Decree 73/2020 art. 12 which will be funded by the Ministry of Ecological Transition. On the 3rd of September 2021, the online public consultation closed. The new program is 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 are being discussed. In addition, tax deduction schemes currently available in Italy are being 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 feedbacks of the REACT group will be used to help define the best modalities to communicate with the energy poor of the rented sector and engage them in future information campaign initiatives.

5.6.2 Data collection and monitoring methods

Through questionnaires, data will be collected on the energy consumption and habits of a group of households. Afterwards ENPOR's training events will be carried out for these households. After a period of 10-12 months, data will be collected again from them through questionnaires. The comparison of the data, before and after the training activities will be carried out and will enable to determine how much influence the information/training initiative had on these households. At the moment, the specific group of people on whom the training will be done has not yet been found. The main difficulty lies in finding private condominiums where energy poor tenants live, that are willing to dedicate some of their time to participate to such trainings, considering also the current health situation related to COVID-19. In fact, in order to get the energy poor tenants engaged and willing to share their information on their energy bills and energy behaviours, a certain degree of trust and interest to the initiative from their side has to be reached, and this often needs direct contacts.

Table 18: 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_2- eq/year)		Calculation based on energy savings
10% savings	Questionnaire	Questionnaire
Improved comfort levels of advised households	Questionnaire	Questionnaire

5.6 Monitoring methodology in The Netherlands

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

5.6.1.1 Energy Box

The Energy Box was established in 2014 by de 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 energy coach provides the residents with energy-saving tips in a report tailored to the resident's situation. The tips can 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 19,000 residents have received energy advice since its establishment in 2014, and more than 2.2 million Euros is saved per year by households through use of the Energy Box.

The main challenge as identified by 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; Churchill & Smyth, 2020; Doukas & Marinakis, 2020; Ampofo & Mabefam, 2021) our target group of energy poor tenants is most likely to be found amongst the lowest 40% incomes, retirees, large families, immigrants/people of non-Dutch ethnicity, students and religious groups. With their current 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 JMA has a lot of experience reaching tenants in the social rental sector. Cooperation with private landlords and commercial housing agencies has barely taken place yet. Focus of our design process has therefore been on redesigning the Energy Box trajectory of promotion for the private rental sector. 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 private rental sector 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 all these meetings have been summarized in the conclusions and have led to a proposal for (re)design of a tool for communication strategies.

Currently 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 through an invitation letter from the housing corporation by post or email. The experience is that this leads to a response rate of approx. 10%. In addition, there are home-to-home visits which increases 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. For example, when energy coaches go door-to-door they often find private tenants not to be at home during the day. It is therefore assumed

that a different communication strategy should be used.

In addition, the population of private tenants currently reached with 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, 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 is currently reaching very few private tenants who experience energy poverty.

With the communication tool we are developing for the Energy box, we aim to improve the communication strategies and tools used to reach the target group of private tenants with energy poverty, by adjusting the strategy and tools to the needs and motivations of the target group. The goal of our redesign will be to increase both the response rate amongst private tenants as well as the % of respondents that struggle to pay their energy bills.

5.6.2 Data collection and monitoring methods

The implementation of the (re)designed tool and subsequent communication strategies will be monitored with data on the number of advised households from JMA as well as regular meetings with JMA representatives. All advised households will receive an evaluation survey, which data we will then analyse. Additionally, we will conduct a number of qualitative interviews with advised households. An additional survey will be 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 19: 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_2- 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