



EmpowerMed

# Comparative analysis of implemented practical measures against energy poverty

*Deliverable 4.3*





Work package: 4

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Deliverable 4.3: Comparative analysis of implemented practical measures

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# TABLE OF CONTENTS

- 1. EXECUTIVE SUMMARY ..... 5
- 1 Introduction..... 8
  - 1.1 Methodology ..... 9
    - Key performance indicators ..... 9
    - Gender indicators..... 10
    - Health indicators..... 11
    - Efficiency indicators..... 11
- 2 ACTIONS PER PILOT SITE ..... 12
  - 2.1 Albania (Vlore)..... 12
    - Gender indicators..... 14
    - Health indicators..... 14
    - Efficiency indicators..... 14
  - 2.2 Croatia (Zadar) ..... 15
    - Gender indicators..... 16
    - Health indicators..... 17
    - Efficiency indicators..... 17
  - 2.3 France (Marseille) ..... 17
    - Gender indicators..... 19
    - Health indicators..... 20
    - Efficiency indicators..... 21
  - 2.4 Italy (Padova) ..... 21
    - Gender indicators..... 22
    - Health indicators..... 23
    - Efficiency indicators..... 24
  - 2.5 Slovenia (Obala) ..... 25
    - Gender indicators..... 26
    - Health indicators..... 28
    - Efficiency indicators..... 28
  - 2.6 Spain (Barcelona) ..... 29
    - Gender indicators..... 31
    - Health indicators..... 32
    - Efficiency indicators..... 33
- 3 RESULTS PER ACTION ..... 34

3.1	Community approaches .....	34
	Results achieved .....	35
	Resources analysis .....	37
3.2	Household Visits .....	38
	Results achieved .....	40
	Resources analysis .....	41
3.3	DIY workshops .....	42
	Results achieved .....	42
	Resources analysis .....	43
3.4	Support to financial schemes.....	44
	Results achieved .....	44
	Resources analysis .....	44
3.5	Health Workshops .....	44
	Results achieved .....	44
	Resources analysis .....	45
4	DISCUSSION .....	45
4.1	Energy and cost savings .....	48
4.2	Stress on women and health.....	49
4.3	Covid-19 impact .....	49
5	LESSONS LEARNED .....	50
6	CONCLUSIONS.....	52
6.1	Recommendations to the EU level decision makers.....	54
7	References .....	57

# 1. EXECUTIVE SUMMARY

Five different actions are considered part of EmpowerMed’s strategy: Community approaches, Household visits, DIY workshops (PV panels, Smart meters and Low-cost measures), Support to financial schemes and Health workshops. Its implementation in the six pilots that form part of the initiative - Albania (Vlore), Croatia (Zadar), France (Marseille), Italy (Padova), Slovenia (Obala), Spain (Barcelona) – has taken place since 2020. Although some actions are still in operation, most of the planned activities have been concluded at this point. Overall, EmpowerMed’s actions directly reached **3,302 people** that participated in the community approaches, household visits and different workshops organized; **62%** of which were **women** (Figure 1). However, the total people impacted is larger as other family members and actors benefitted from the actions implemented by direct participants.

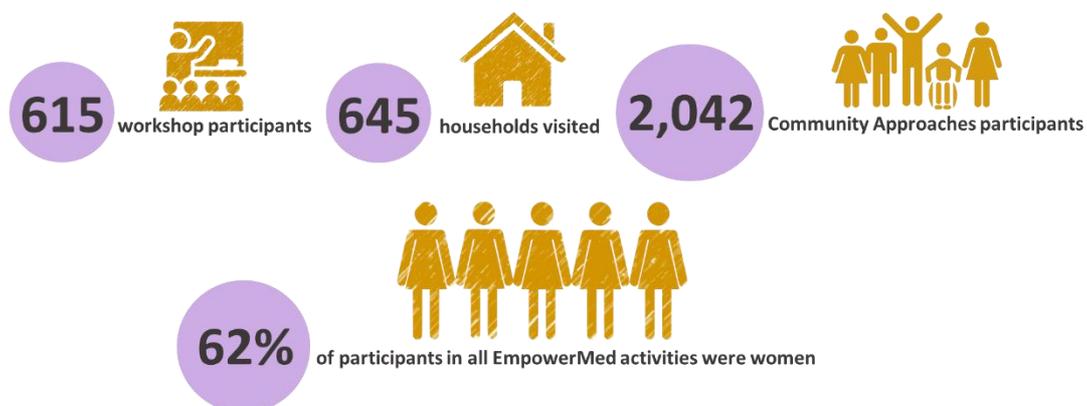


Figure 1. Overall participation in EmpowerMed’s activities

This document presents and compares the results obtained through the different actions implemented by each pilot, and also analyses the impact of each action individually. It must be noted that not all actions are carried out in all pilots. The analysis is done using a set of Key Performance Indicators (KPIs) that were specifically defined for this purpose considering the partners’ expectations for each action. Furthermore, a group of efficiency indicators are also defined considering the relationship between the efforts required – money, time, people – and the outcomes obtained (cost, energy and emissions savings). The resources data used for the latter are approximations based on the partners’ experiences and not audited costs. As observed in Figure 2, globally, the carried out activities resulted in total expected energy savings of **1,156 MWh/year** as well as **7,717 m<sup>3</sup>/year** of water. These translated into expected cost savings of **315 k€/year** and emissions reductions of **265 tonCO<sub>2</sub>/year**. Furthermore, **21 people** was **free of debt**. The obtained results per action indicate that Household visits are the most impactful action in terms of cost savings achievements, whereas Community approaches seem to be more effective in reaching a larger number of affected households. Moreover, Community approaches seem to be less resource intensive, as they require less time and people involved to reach the same number of affected households than other activities. Still, the successful implementation of Community approaches takes a longer time to achieve, as it requires the involvement of different actors, and its positive impacts in terms of cost

savings depend on the existence of policies or regulations protecting vulnerable consumers, or market conditions where customer can optimize their contract by changing companies or contracted tariffs. Otherwise, Community approaches might be a useful tool to demand such conditions, but the need of political activism implies even longer time to get tangible impacts. In EmpowerMed, only the pilots in Spain and Slovenia reported cost savings for this action, being significantly higher in the first where Collective assemblies existed prior to the project start. For the rest, a more informative approach was used, which brings its own benefits but complicates accounting for tangible cost, energy or emissions savings to sum up to the KPIs stated for this project.

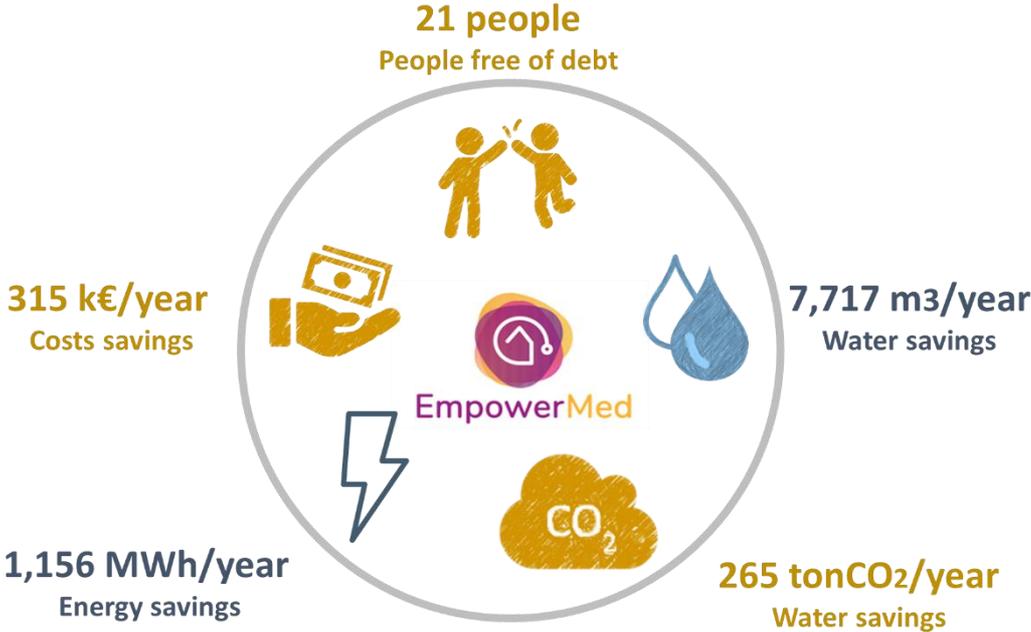


Figure 2. Relevant KPIs reached through EmpowerMed activities

Household visits, on the contrary seem to be effective under different local conditions as all pilots where they were implemented reported to achieve significant cost savings. Moreover, these actions also reflected into emissions, energy and water savings, which are not accomplished when using the Collective assemblies’ approach. Nonetheless, the amount of potential savings achieved might be higher or lower depending on local factors such as the state of the buildings, the types of fuels, and the electricity market conditions. For instance, among EmpowerMed pilots, Croatia and Albania reported the highest energy savings, but Croatia and Italy had the largest cost savings.

DIY workshops also reported the least impact in terms of cost, emissions and energy savings as they followed a more instructional approach. Nonetheless, some values were reported for the pilots in Slovenia and Spain where more practical approaches were used. In the first case, through the distribution of efficient lighting devices, and in the second via a monitoring campaign that allowed the optimization of the participants’ electricity contract conditions. In the rest of the pilots, the workshops were mostly designed to raise awareness among energy poverty issues. They, however, enjoy of great acceptance among certain groups, in particular youth. An example, is the DIY PV solar workshop implemented in the Croatian pilot, when participants were able to install a self-generation device into an affected household without interconnection to the man grid, or the workshops conducted



in Padova, Italy in the context of cultural festivals. This characteristic makes workshops a suitable candidate to be integrated and create synergies with other activities such as Community approaches.

In a similar fashion, Health workshops contributed to add knowledge among community members about the links between energy poverty and health issues. A relevant approach was taken in Slovenia where these workshops were addressed to health practitioners, which in turn, is expected to impact on affected people receiving care from these professionals. Other interesting example was followed in the pilot in Barcelona, Spain, where mutual support groups coordinated by a therapist were put in place, offering affected users a safe space to share their concerns and experiences.

The Support for financial schemes action faced several challenges that complicate their implementation. First, because not all countries have schemes suitable to households affected by energy poverty. Second, because even when they exist, affected users are often reluctant to use it due to the process complexity or mistrust in the handling institutions.

From all the activities carried out in the six EmpowerMed's pilots, the data gathered supports the thesis upon which the project was designed: a large portion of Mediterranean households suffer of energy poverty and this problem impacts more negatively on women. Project data also shows that women are active participants in initiatives such as EmpowerMed, but their decision-making power is still lower than men when it comes to energy supplies. This is indicated by the fact that, in most cases, more men than women were contract holder or in charge of decision-making at home even though women participants were usually more numerous.

More details about the indicators used to evaluate the different actions are discussed in Section 1. Afterwards, the challenges and successes experience during the implementation of EmpowerMed's actions into the different pilots can be consulted in Section 2. In Section 3, all of the actions are evaluated individually, comparing local effects on the reported outcomes. The overall results from the EmpowerMed initiative from the partners' experience is presented in Section 4, whereas the lessons learned during the project development are later discussed in Section 5. Finally, the conclusions and recommendations arising from this analysis can be found in Section 6.

# 1 Introduction

The implementation of energy poverty mitigation actions is at the core of the EmpowerMed project, which has the ultimate goal to tackle energy poverty and help improving the health of people in the coastal areas of five Mediterranean regions: Albania (Vlore), Croatia (Zadar), France (Marseille), Italy (Padova), Slovenia (Obala), Spain (Barcelona). EmpowerMed’s actions can be categorized into five groups: 1. Community approaches, 2. Household visits, 3. Do-It-Yourself (DIY) workshops (which englobes DIY Photovoltaic panels, DIY Smart meters and Low-cost measures), 4. Support to financial schemes, and 5. Health workshops. The specific actions implemented in each of the pilot sites can be consulted in the table below, and further details can be consulted in Deliverable 4.1 Data recording, collection framework and analysis framework (D4.1).

**TABLE 1. Implemented actions in EmpowerMed’s pilot sites (marked with yellow)**

Action		Albania	Croatia	France	Italy	Slovenia	Spain
<b>Community approaches</b>							
<b>Household visits</b>							
<b>DIY workshops</b>	<b>PV panels</b>						
	<b>Smart meters</b>						
	<b>Low-cost measures</b>						
<b>Support to financial schemes</b>							
<b>Health workshops</b>							

Source: own elaboration.

The different contexts in which EmpowerMed’s pilots are located means that not all actions can be implemented in all places. It also means that the same action will not necessarily have the same impact across all pilots where it has been used. This is why the present analysis aims to compare the contribution of EmpowerMed actions towards the project goal through two perspectives, first, comparing the results of the different actions implemented within each pilot, and, second, comparing the effectiveness of a same action across different pilots considering the particular methodology used and the regional context.

The specifics of the actions implemented in each pilot site are presented in Section 2, including results and associated costs, while the comparison of their performance across different sites is done in Section 3. In the latter, the cost-benefit relation is considered as an indicator of an action’s effectiveness in addition to the project Key Performance Indicators (KPIs). The overall project’s results are discussed in Section 4, emphasising the regional aspects that might have influenced the observed differences in a same action’s performance, as well as those particularities that makes an action effective regardless of the context in which it is implemented. The lessons learned throughout the project duration are discussed in Section 5, considering the observed results as well as the partners’ experiences gathered through a qualitative survey. Finally, conclusions are presented in Section 6, highlighting those findings that might be useful to provide policy recommendations for the promotion of successful and cost-effective manners to tackle energy poverty in the Mediterranean, with special focus on women and health.



## 1.1 Methodology

The performed analysis is carried out based on the information gathered through the data collection tools, surveys and observation strategies described in D4.1. Moreover, the results from an activity implemented during EmpowerMed’s General Assembly – held in Zadar, Croatia in May 2022 – to collect data regarding the costs and efforts needed to implement the actions described in Table 1 are also included in the analysis, as well as the responses from a survey applied to pilot managers to get a deeper understanding of regional differences. The results include those actions carried out up to May 2023, where data was gathered and compile to its inclusion in this report.

### Key performance indicators

The EmpowerMed project has set a group of indicators designed to measure its contribution towards EP mitigation following a sustainable and women empowerment vision. This includes indicators measuring the different actions’ impact on energy, climate, economy, health and gender dimensions. These are:

**TABLE 2. Key performance indicators established for EmpowerMed pilots**

Dimension	KPI	Units
Energy	Total energy savings	kWh/year
	Total electricity savings	kWh/year
	Total heat savings	Total heat savings
	Total primary energy savings	kWh/year
Climate	Total emissions savings	CO <sub>2eq.</sub> /year
	Total water savings	m <sup>3</sup> /year
Economy	Total economic savings	€/year
	People free of debt	Households
Health	Participants in health support workshops	Participants
Gender	Number of participants	Number of people
	Women participation	Number of women
	Percentage of energy savings directed to women	%
	Percentage of cost savings directed to women	%
	Number of women free of debt	Number of women

Source: own elaboration.

Not all implemented actions are expected to result on positive impacts across all dimensions. During a workshop held in EmpowerMed’s General Assembly held virtually in October 2020, partners were asked to rate from 1 (Very Low) to 5 (Very High) the expected impact that each action would have on the defined KPIs. Those expected to have no impact were not rated at all. The overall results from this exercise are shown in Table 3, highlighting in yellow those with expected High (4) or Very High (5) impact, and in pink those with Low (2) and Very Low (1) rating.

Each action is expected to have High or Very High impact in at least one dimension. Energy savings, and thus emissions savings, are correlated to Household visits, DIY Low cost

measures and DIY smart-meters. Cost savings are mostly expected in Community approaches, DIY smart-meters and DIY solar panels. Investments in renewables are supposed to be prompted via Support for financial schemes and DIY solar panels. Health and thermal support are mostly correlated with Health workshops. The gender dimension is particularly covered by Household visits, Community approaches and Health workshops, at least regarding women participation, women empowerment and economic savings allocation to females. DIY smart meters is also expected to contribute to this goal towards economic savings and investments in renewables address to women-led households. No action is expected to have a high impact on people free of debt or development of gender-just energy policies and legislations. In this sense, it should not be forgotten that these are joint goals, and the individual impacts from each pilot might have different implications.

**TABLE 3. Expected relation between project actions and KPIs as reported by partners' reflections.**

KPIs		Actions						
		HHV	CA	HW	SFS	DIY Low cost	DIY smart meters	DIY solar panels
Energy savings		High	Fair	Low	Low	High	High	-
Emission savings		High	Fair	Low	Low	High	High	Fair
Economic savings		Fair	Very High	Low	Low	Fair	Very High	High
Investment in renewables		Low	-	Very Low	Very High	Very Low	Low	Very High
Woman and men free of debt		Low	Fair	Very Low	-	-	Fair	-
Health support		Fair	Low	Very High	Low	Low	Very Low	Low
Thermal support		Fair	Fair	Very High	Low	Fair	Fair	Low
Gender	Participation of women	High	Very High	High	Low	Low	Fair	Low
Gender	Empowerment of women	Fair	Very High	High	Very Low	Low	Fair	Low
Gender	Economic Savings	Fair	Fair	Low	Low	Low	High	Low
Gender	Investment in renewables	Very Low	-	Very Low	Low	-	High	Low
Gender	Development of gender-just policies/legislation in the energy sector	Low	Low	Fair	Low	-	Low	Low

\*CA: Community approaches, HHV: Household visits, DIY: Do-It-Yourself workshops, SFS: Support for financial schemes, HW: Health workshops.

Source: Partners collective reflection during EmpowerMed's General Assembly in October 2020

## Gender indicators

In addition to the key gender indicators described in Table 2, the results from a survey collecting information on women empowerment at home is available for some pilots. This information is presented separately for each activity, informing about the following

indicators:

- Percentage of participant households in which women are in charge of taking decisions regarding basic supply services (choosing company, tariff, selecting contract conditions, etcetera).
- Percentage of participant households in which energy bills are addressed to women (identified using the contract-holder's gender).
- Percentage of participant households in which women are in charge of paying energy bills; meaning they are responsible of paying companies whether or not they are the contract holder.

### Health indicators

Some data regarding participants' self-perceived health is available from the same survey providing insights about women empowerment at home. As they add some insights about the relationship between health and energy poverty, the results for the following items is presented for those pilots where the information is available, disaggregating by action:

- Self-perceived health conditions (Prefer not to answer, Very poor, Poor, Fair, Good, Very good).
- Longstanding health issues or illness (Prefer not to answer, Yes, No, Don't know).

### Efficiency indicators

Additional KPIs are used for the evaluation of each actions' cost-to-benefit ratio, considering the amount of money, time and human resources involved in each activity. The list of the used cost-efficiency KPIs is the following:

- Energy saved per energy adviser involved in the activity (kWh/adviser).
- Energy saved per hour of labour investment (kWh/hour).
- Energy saved per euros invested (kWh/€).
- Euros saved per energy adviser involved in the activity (€/adviser).
- Euros saved per hour of labour investment (€/hour).
- Euros saved per euros invested ( $\frac{\text{€}_{\text{saved}}}{\text{€}_{\text{invested}}}$ ).
- Hours of labour invested per household reached (h/household).
- Euros invested per household reached (€/household).

The above indicators are calculated considering the resources summarized in Table 4. These are estimates based on information provided by the partners, not the real operational costs and time efforts, which would require a more intensive reporting from each partner and is not part of the scope of this document.

**TABLE 4. Resources considered for each evaluated activity.**

Action	Pilot	Human effort [People]	Labour [Hours]	Costs [Euros]*
Community approaches	Slovenia	6	141	75
	Spain	5	796	0
Household visits	Albania	31	837	4,400
	Croatia	10	1,542	20,000
	Italy	45	1,482	3,906
	Slovenia	5	457	6,908
DIY Workshops	Italy	12	128	0
	Slovenia	3	49	75
	Spain	5	748	13,873

\*Except labour costs (salaries).

Source: own elaboration based on assumption and received partners' information.

To account for potential labour costs in the analysis, the mean hourly labour costs per country are considered only for comparative purposes. It must be noted that the actual cost might be higher or lower depending on the qualifications required by the staff involved in each action. Extra information about the number and qualifications of people required per action will be discussed in the Cost-benefit analysis per pilot presented in Section 3, based on information shared by EmpowerMed's partners.

**TABLE 5. Mean hourly labour cost per country.**

Country	Cost [€/hour]
Albania*	2.6
Croatia	11.2
France	37.9
Italy	29.3
Slovenia	21.1
Spain	22.9

\*Data from 2016 as it is the latest value available.

Source: Eurostat (2021).

## 2 ACTIONS PER PILOT SITE

### 2.1 Albania (Vlore)

As seen in Table 1, Community approaches, Household visits, DIY Workshops and Support for small investments were selected for implementation in Vlore, Albania. The most impactful action was Household visits as 100 homes participated in the program between December 2020 and March 2021, reaching the indicators shown in Table 6. The second activity with the highest reach were Community approaches, which were implemented through six events held between November 2021 and April 2022. The collective assemblies were organized in collaboration with the Change Centre NGO located in Vlora, municipality

and targeted different neighbourhoods, having a total of 80 participants, 70 of which were women. The Collective assemblies in Albania consisted in informative events raising awareness about energy poverty and its particular impact on women, which are especially affected by this issue. In addition to the high female participation, it is important to highlight that the large majority of attendees were between 20 and 40 years old, as the last two meetings (40 attendees) were addressed to this particular demography through a youth unemployment network.

**TABLE 6. Overall results for Vlore pilot site.**

KPI	CA	HHV	DIY	SFS	Total
Participants (women)	86 (70)	100 (49)	40 (23)	-	220 (142)
Electricity savings [kWh/year]	-	65,353	0	-	65,353
Heat energy savings [kWh/year]	-	47,072	0	-	47,072
Energy savings* [kWh/year] (%women)	-	112,426 (49%)	0	-	112,426 (49%)
Water savings [m <sup>3</sup> /year]	-	2,227	0	-	2,227
Primary energy savings [kWh/year]	-	214,555	0	-	214,555
Cost savings [€/year] (%women)	-	9,922 (55%)	0	-	9,922 (55%)
CO2 savings [kgCO <sub>2</sub> /year]	-	51,135	0	-	51,135

CA: Community approaches, HHV: Household visits, DIY: Do-It-Yourself workshops, SFS: Support for financial schemes.

\*Includes heat and electricity.

From EmpowerMed's DIY workshops, the Small low-cost measures action was the only implemented in this pilot. Two sessions were carried out during March 2022, teaching attendees how to improve wellbeing at home, save energy and water, potential home improvement investments, and available information and help sources. Although this action spread awareness about energy and water saving, and provide participants with information needed to follow energy-related investments, there is no straightforward way to ensure these actions were actually implemented and how much energy, emissions and costs were saved as a result.

Getting detailed information would imply an extensive follow-up from the workshop participants, which was not feasible within EmpowerMed's scope. This is why only the number of participants KPI is available from this action (Table 7). However, a satisfaction survey was applied after the DIY workshop conclusion, obtaining satisfactory responses from the participants. In particular, 90% of attendees said that the training fully met their expectations and that the information received was useful for the future, which indicates willingness to follow the recommendations provided. More information about this survey can be found in the DIY workshop proceeding presented in Deliverable 3.4.

For Support for financial schemes, there is no data at the moment as the implementation faced a series of barriers that impacted negatively on expected performance. Specifically, Vlore pilot managers refer that after researching options to launch this action, only financial schemes from commercial banks were found to be available in the project area, which are not suitable to the needs of EP-affected households and could not be promoted.

### Gender indicators

The percentage of participants in the households' visits that identified as women are 49% in Albania. The amount of energy savings associated to women-led households stays in similar levels (Table 6), while costs savings are higher for this particular group. Additional women-empowerment information that was gathered during the visits is presented in Figure 3. As observed, the share of women in charge of energy decision-making is lower than in the participation indicator, which might affect the final outcome as women participants might not be able to implement the suggested measures.

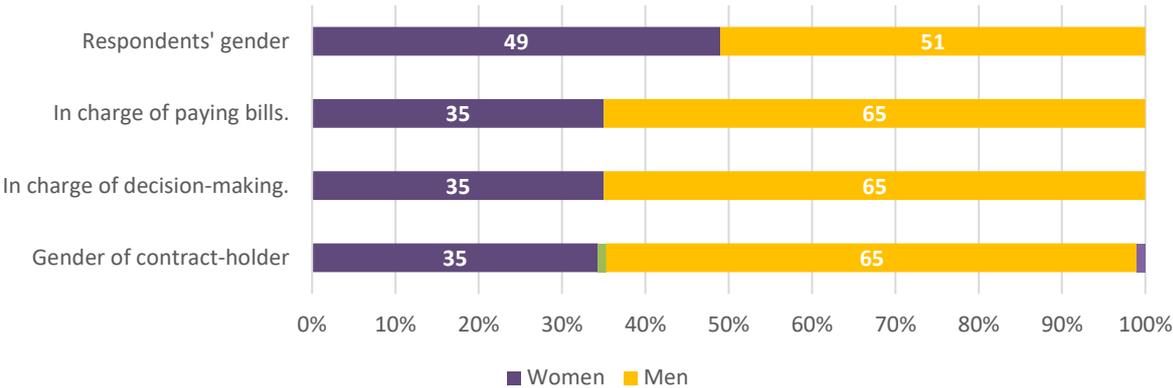


Figure 3. Gender indicators for Household visits in Vlore pilot site (n = 100).

For DIY workshops, only the percentage of women participants is known (60%). Still, it is worth pointing out that this is slightly higher than for Households visits, in which equal participation from men and women was practically met. From the two workshops held, women participation was particularly high during the first (14 out of 16 attendees), which addressed unemployed local youth. In the second, formed by activists and members from local Non-Governmental Organizations (NGOs), women were actually a minority (9 out of 24). This might be associated to the fact that women tend to be overrepresented in unemployed groups, and underrepresented in leadership positions.

### Health indicators

From the Household visit participants, 23% reported to have poor or very poor health condition, while 51% expressed to have good or very good health. Moreover, a third of respondents (32%) reported to have a longstanding illness or health condition.

### Efficiency indicators

In terms of efficiency, only KPI's from Household visits are available due to the issues explained before. As observed in Table 7, the amount of euros per household is an affordable amount and allows achieving considerable energy savings that translate into enough economic savings to justify the costs needed to implement the action. Nonetheless, it must be noted that the calculations are done considering pro-bono work by volunteer energy advisers although in some cases they are paid (for instance, when EmpowerMed staff performs this function), and that incorporating these costs might raise the numbers. Still, the identified euros saved per hour of labour are considerably higher than the average

labour hour cost in Albania (€ 2.6 as indicated in Table 5), which indicates that this action might be worth implementing even in cases where paid labour and no volunteering is used.

**TABLE 7. Efficiency indicators for the Albania Pilot site.**

KPI	HHV
Euros invested per HH [€/HH]	44
Labour hours per HH [h/HH]	8.37
Energy savings* per energy adviser [kWh/adviser]	3,627
Energy savings* per labour hours [kWh/h]	134
Energy savings* per euros invested [kWh/€]	26
Euros saved per energy adviser [€/adviser]	320
Euros saved per labour hours [€/h]	12
Euros saved per euros invested [€ <sub>saved</sub> /€ <sub>invested</sub> ]	2.25

HHV: Household visits.

\*Includes heat and electricity.

## 2.2 Croatia (Zadar)

In Zadar pilot, all five EmpowerMed's actions were planned to be implemented, although only PV panels and low-cost measures workshops were planned as part of the DIY actions. The collective assembly's action was implemented in two events taking place the 25 of June 2021 and the 27 of September 2021. The assemblies' goal was to spread awareness about energy poverty using a gender perspective, share strategies to address it, and connect local stakeholders working in this subject. As the assemblies were merely informative, only the participants KPI is available for this action (Table 9).

**TABLE 8. Overall results for Zadar pilot site.**

KPI	CA	HHV	DIY	SFS	HW	Total
Participants (women)	31 (20)	200 (142)	17 (5)	-	-	248 (167)
Electricity savings [kWh/year]	0	766,798	0	-	-	766,798
Heat energy savings [kWh/year]	0	114,124	0	-	-	114,124
Energy savings* [kWh/year]	0	880,922	0	-	-	880,922
Water savings [m <sup>3</sup> /year]	0	0	0	-	-	0
Primary energy savings [kWh/year]	0	1,336,756	0	-	-	1,336,756
Cost savings [€/year]	0	94,624	0	-	-	94,624
CO2 savings [kgCO <sub>2</sub> /year]	0	188,871	0	-	-	188,871

CA: Community approaches, HHV: Household visits, DIY: Do-It-Yourself workshops, SFS: Support for financial schemes, HW: Health workshops.

\*Includes heat and electricity.

A total of 200 households were reached during the Household visits action. The EmpowerMed's survey was carried out and additional data on cost, energy and emissions savings were collected through EmpowerMed's tool. As observed in Table 8, the highest

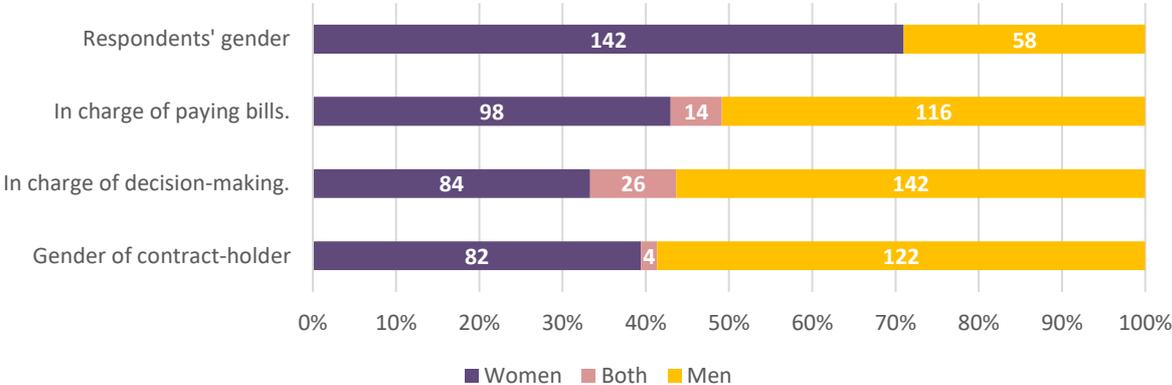
percentage of energy savings are attainable to electricity savings, which account for 87% of the total savings. This translates into 94 thousand euros and 188 tons of CO<sub>2</sub> saved per year, which represent the only cost and emissions savings reported by the actions implemented in the Zadar pilot.

Regarding DIY workshops, two sessions were held focusing on teaching attendees about solar PV and energy storage systems, as well as provide hands on experience by setting up a solar PV system and installing it in one of EmpowerMed’s participants that has no grid connection. The participants KPI can be consulted in Table 8. It must be noted that the maximum number of participants was limited to 10 per workshop due to Covid-19 restrictions. Other KPIs are not available due to lack of data, although some costs, energy and emissions savings might have been achieved if gasoil or other fuel-led devices were previously used to light the household.

As stated in Table 8, data for Support for financial schemes and Health workshops is not available for this pilot.

**Gender indicators**

Women’s participation during Household visits was particularly high in Zadar pilot, as 71% of the participants identified as female. However, women empowerment indicators show that men tend to be more commonly in charge of making decisions regarding the household’s energy supply, which might affect the actual implementation of actions learned by women during the Household visits. It is also noticeable that a percentage of households share the decision-making process equally, although men are still the majority of contract holders.



**Figure 4. Gender indicators for Household visits in Zadar pilot site (n = 200).**

In the other two actions from which data is available, women participation was also high in Community assemblies (65%) but low in DIY workshops (30%). In Collective assemblies, attendees were experts from organizations working on energy poverty-related issues, whereas in DIY workshops these were local people interested in PV solar and energy storage devices. It is relevant to mention that the DIY workshop topics are classified within the STEM area – Science, Technology, Engineering and Mathematics – in which women tend to be underrepresented.



## Health indicators

From the 200 households participating in the Zadar pilot, 36% reported to have poor or very poor health condition, whereas a similar percentage reported a neutral status and just 19% refer to have good or very good conditions. More surprisingly, 64% of the respondents mentioned to have a longstanding illness or health problem.

## Efficiency indicators

As Household visits are the only action implemented in Zadar which resulted in reported energy and cost savings, the efficiency indicators are calculated for this action. The total amount of euros invested per household is 100 euros, but the energy savings achieved and consequent costs avoided, seem to justify the investment. As observed the euro saved to euro invested ratio is positive. Moreover, the amount of euros saved per hour of labour invested indicates that even if non-volunteering work is considered, the action might still result in positive economic savings even when accounting for the typical wage per hour in Croatia (11.2 euros).

TABLE 9. Efficiency indicators for Zadar pilot site.

KPI	HHV
Euros invested per HH [€/HH]	100
Labour hours per HH [h/HH]	7.7
Energy savings* per energy adviser [kWh/adviser]	88,092
Energy savings* per labour hours [kWh/h]	571.3
Energy savings* per euros invested [kWh/€]	-
Euros saved per energy adviser [€/adviser]	9,462
Euros saved per labour hours [€/h]	61.7
Euros saved per euros invested [ $\frac{\text{€}_{\text{saved}}}{\text{€}_{\text{invested}}}$ ]	4.7

CA: Community approaches, HHV: Household visits, DIY: Do-It-Yourself workshops, SFS: Support for financial schemes, HW: Health workshops.

\*Includes heat and electricity.

## 2.3 France (Marseille)

Community approaches, Household visits, DIY workshops, Support for small investments and Health workshops were implemented in the French pilot. As observed in Table 10, only data regarding the number of participants is available for Community approaches, DIY and Health workshops. Although Covid-19 affected all of EmpowerMed's pilots, project managers from Marseille reported to be specially affected by having to limit the number of sessions and participants scheduled for each action.

A total of 14 collective assemblies in nine different days were held as part of the Community approaches strategy, with attendees coming from different backgrounds depending on the day. Contrary to the Barcelona pilot where Community approaches lead to direct actions that reflect on cost savings and other KPIs, the assemblies in Marseille took a more informative approach. The meetings' goal was to raise awareness about energy poverty-related issues, including basic information about energy consumption, electrical and

natural billing, tips for supplier selection and potential energy saving measures. Nonetheless, there is no data showing whether the attendees follow up the recommendations and to which extend this impact on EmpowerMed’s KPIs. This, however, does not necessarily mean that energy, costs or emissions savings were not achieved as part of this action.

**TABLE 10. Overall results for Marseille pilot site.**

KPI	CA	HHV	DIY	SFS	HW	Total
Participants (women)	298 (162)	39 (30)	74 (49)	7(6)	58 (49)	476 (296)
Electricity savings [kWh/year]	-	10,806	-	-	-	10,806
Heat energy savings [kWh/year]	-	8,112	-	-	-	8,112
Energy savings* [kWh/year]	-	18,918	-	-	-	18,918
Water savings [m <sup>3</sup> /year]	-	519	-	-	-	519
Primary energy savings [kWh/year]	-	36,731	-	-	-	36,731
Cost savings [€/year]	-	3,022	-	-	-	3,022
CO2 savings [kgCO <sub>2</sub> /year]	-	2,706	-	-	-	2,706

CA: Community approaches, HHV: Household visits, DIY: Do-It-Yourself workshops, SFS: Support for financial schemes, HW: Health workshops.

\*Includes heat and electricity.

During Household visits, 39 families were involved, 77% of which were led by women as seen in Table 10. As part of the activity, a total of 72 LED lightbulbs, 32 power strips, 15 water flow regulators, 31 tap aerators, 25 draught proofing windows, 22 draught proofing door, 13 radiator insulation, and 16 thermometers were distributed and installed in the participant households. These devices resulted in the energy, water, cost and CO2 emissions savings summarized in Table 10.

Within the DIY workshops, two actions were implemented: low-cost measures and smart-metering. Six sessions were held for DIY low-cost small measures and eight were held for the smart-metering approach. Although the scope of the workshops was mostly to inform consumers and raise awareness about energy saving measures, the DIY low-cost small measures workshops prompted some actions addressing energy poverty at some of the workshop locations. In particular, one of the workshops held at a social housing organization for immigrant workers, managed to convinced tenants to replace cast iron electrical plates with induction appliances, and install PV solar or/and thermal systems to reduce energy expenses. However, the project is still in early stages and no data to calculate the proposed KPI is available at this point. Similarly, other locations show interest in implementing some of the recommendations given at the workshops, but its quantification is not currently viable due to lack of data.

Finally, eight Health workshops were organized in this pilot. These focused mostly on identifying potentially energy hazards at home and raising awareness about the importance of maintaining a good thermal comfort and indoor air quality conditions. No KPIs are available from this action except from the number of participants.

No data from Support to financial schemes actions is available from Marseille pilot, except for the participation rates shown in Table 10.

### Gender indicators

The participation numbers show a strong involvement of women in all reported activities, as females represented 54% of Collective assemblies’ participants, 77% in Household visits, 66% in DIY workshops and 84% in Health workshops. As in other pilots, women participation is higher when groups in situation of financial vulnerability are addressed. Household visits, DIY workshops and Health workshops’ attendees belonged to financially vulnerable groups. Collective assemblies, on the other hand, involved different groups: visitors to social centres, charitable organizations and local NGOs; staff from financially vulnerable groups working in social companies; and university students, which included people who were not affected by energy poverty. The sessions held at the local university registered the highest number of participants (140) but the lower female participation (30%) from all sessions. In the rest of Collective assemblies, in which people in situation of financial vulnerability were addressed, women’s participation (76%) was similar to that of Household visits.

From the Household visits’ data (n= 25 respondents), women empowerment indicators show similar trends to other pilots, in the sense that a fewer percentage of women had an active role at home than the share of participants. However, the gap is smaller than in other places. In fact, it is relevant to observe the higher percentage of participant households in which women, or both genders, are active participants in energy-related issues at home, particularly when compared to other pilots’ data.

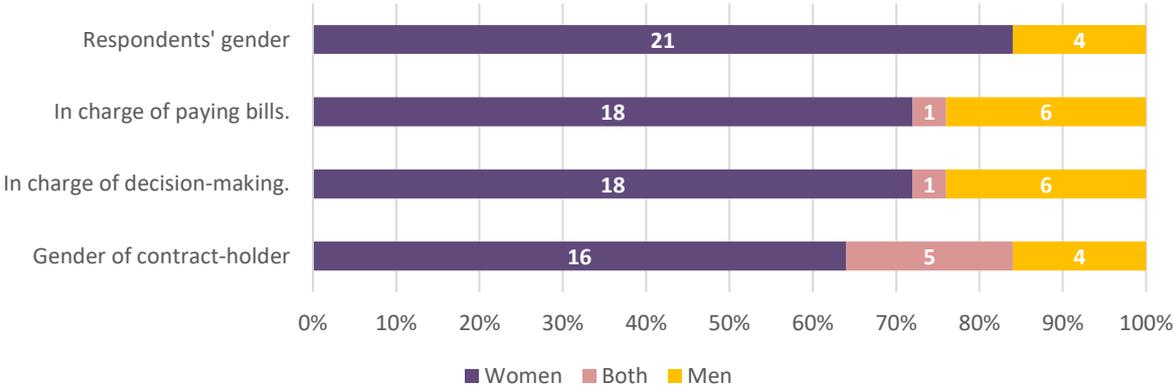


Figure 5. Gender indicators for Household visits in Marseille pilot site (n = 25).

Women empowerment data from 15 out of the 74 participants to DIY workshops is also available for Marseille pilot. Similar to Household visits results, the share of women in empowerment indicators is slightly lower than the share of respondents, but the gap is narrower than in other pilots. The high percentage of households in which men and women together are in charge of paying the bills is relevant, although the sample is small to be conclusive about gender dynamics in Marseille’s pilot.

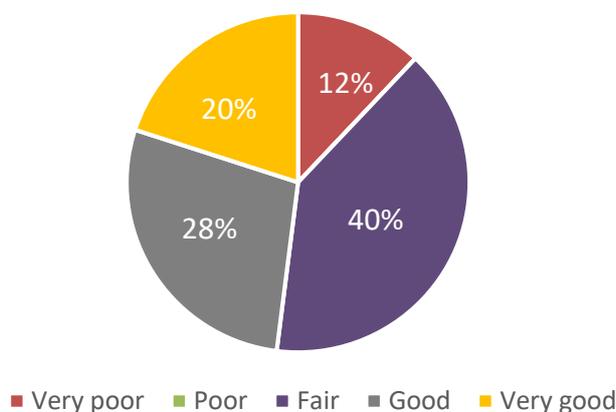


**Figure 6. Gender indicators for DIY workshops in Marseille pilot site (n = 15).**

From Health workshops' participants, contract-holder's gender information is available from 41 participants. Within this group 71% reported that their energy and water supply contracts were under the woman or both genders' names. This is lower than the share reported for Household visits (84%) and lower than the female participants share in this activity (85%), which reflects the trend observed in other pilots where women are less empowered at home even when they are overrepresented in financially vulnerable homes. No information is available regarding the gender of the person in charge of paying bills or making decisions, so no other conclusions can be drawn in this case.

### Health indicators

Health indicators are only available for the Household visits action. As observed in Figure 7, most of the respondents (48%) mentioned to have good or very good health condition, while 40% reported to have a fair health condition. Just 12% stated to have a very poor condition, and no "poor health condition" responses are recorded. However, 56% of respondents stated to have a longstanding condition. From this group, 50% reported to suffer from high blood pressure, and 1% from migraines, depression and anxiety. The rest did not specify the nature of their longstanding health issue.



**Figure 7. Health indicators for Household visits in Marseille pilot site (n = 25).**

## Efficiency indicators

No efficiency indicators are available for Marseille pilot.

### 2.4 Italy (Padova)

In the Italian pilot, Community approaches, Household visits, DIY workshops, Support for small investments and Health workshops were held. Two collective assemblies were held as part of the first approach. Due to Covid-19 restrictions, both sessions had to be done online. Although more than 1,039 potential beneficiaries were contacted and invited to the sessions, only 26 attended the first assembly (21 February 2022) and 27 the second (16 March 2022), adding to a total of 53 participants as shown in Table 11.

Household visits were implemented in two stages. The first took place during the summer of 2021, including 62 households from the Padova region and leading to a total of 18,298 kWh/year saved. The second stage was done in the winter and spring of 2023, summing 54 new participants and saving 54,845 kWh/year. These energy savings also translated into emissions and cost savings for households in situation of financial vulnerability that participated in this action, as shown in Table 11. Water savings equal to 3,710 m<sup>3</sup>/year are also estimated to result from the Household visit actions.

For DIY Workshops two face-to-face sessions were implemented in September 2021: DIY Low cost measures workshop (17 participants), and DIY Smart meters (15 participants). This last activity included an additional part related to the understanding of basic supplies bills. Both sessions were held in a cultural festival held in a specific neighbourhood in Padova (*ArcellaBella*). Thus, attendees were mostly local residents interested in energy issues. Additionally, an online DIY Low cost measures workshop was organized in collaboration with eight municipalities of Vicenza Province. However, no data regarding participants is available from this DIY session, so it is not accounted in the KPIs presented in Table 11. Nonetheless, it must be noted that the recorded sessions have 445 views (meaning people clicking and watching the video) by the time of this report. As the DIY sessions were mostly informative, no KPIs regarding energy, cost or emissions savings are available for this activity.

Workshops on support to financial schemes were also implemented during this cultural festival, specifically on the 15 of September 2021. This action's format was similar to that implemented for DIY workshops. The topics discussed during the session focused on energy efficiency actions implemented by Padova's local government in the region, the functioning of an energy savings one-stop window provided by the municipality, and an explanation about available financial schemes addressed to energy efficiency investments and how to take advantage of them. The topics were presented by representatives from Padova's municipal government and experts on financial scheme. A member from SOGESCA also participated introducing EmpowerMed work to the assistants. A total of 14 people attended the event.

Similar to the approach used for other actions, a Health workshop was held in collaboration with local partners during a cultural festival organized in Padova around sustainable development topics (*Festival dello Sviluppo Sostenibile 2021*). The main goal of the workshop was to raise awareness about available solutions for the redevelopment of buildings to improve people's quality of living, for instance, by improving their indoor

thermal comfort. A total of 11 people participated in this workshop as seen in Table 11. As these workshops were merely informative, no other KPIs could be calculated.

**TABLE 11. Overall results for Padova pilot site.**

KPI	CA	HHV	DIY	SFS	HW	Total
Participants (women)	53 (38)	116(60)	32 (15)	14 (7)	11 (6)	226(126)
Electricity savings [kWh/year]	0	14,064	0	-	0	14,064
Heat energy savings [kWh/year]	0	59,135	0	-	0	59,135
Energy savings* [kWh/year]	0	73,143	0	-	0	73,143 (45%)
Water savings [m <sup>3</sup> /year]	0	3,710	0	-	0	3,710
Primary energy savings [kWh/year]	0	99,889	0	-	0	99,889
Cost savings [€/year]	0	145,304	0	-	0	145,304 (93%)
People free of debt [persons]	0	0	0		0	0
CO2 savings [kgCO <sub>2</sub> /year]	0	20,754	0	-	0	20,754 (44%)

CA: Community approaches, HHV: Household visits, DIY: Do-It-Yourself workshops, SFS: Support for financial schemes, HW: Health workshops.

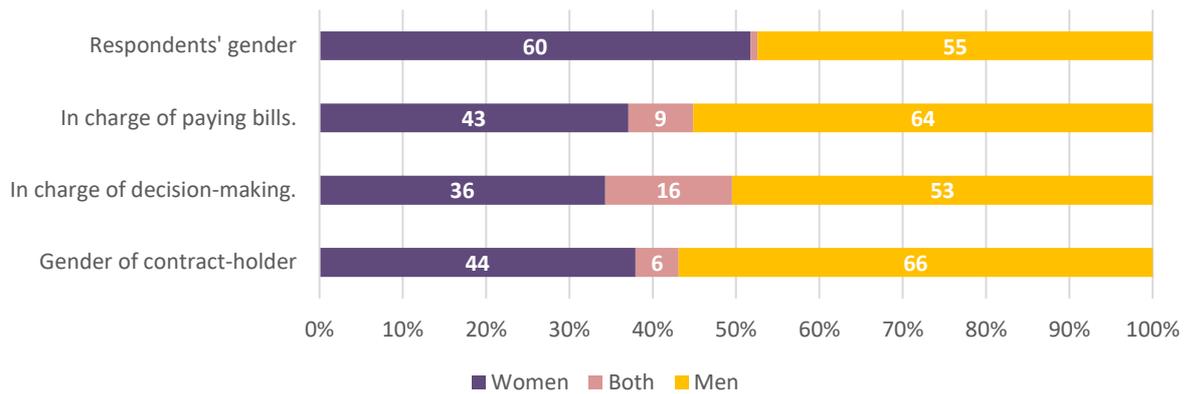
\*Includes heat and electricity.

## Gender indicators

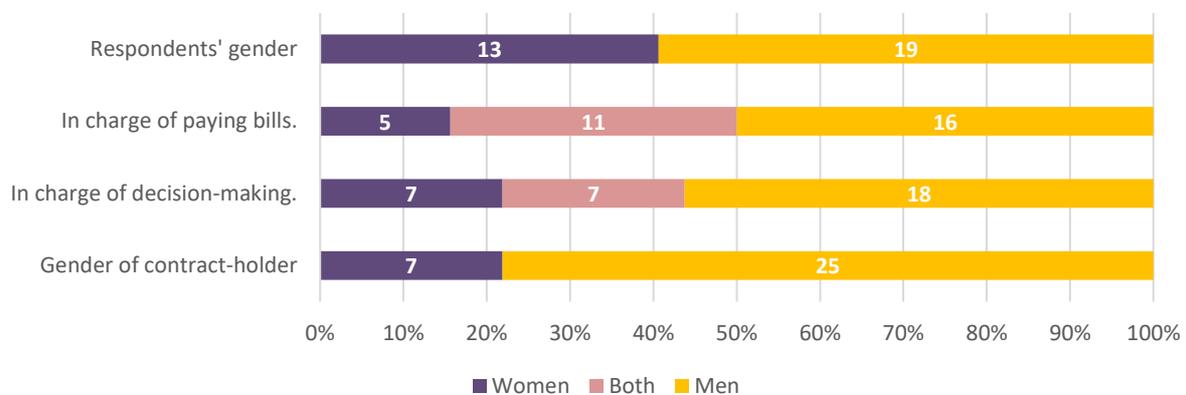
Women's participation in the Italian pilot's activities was particularly high in Community approaches in which they represented 72% of the attendees. In the rest of activities women represented 52% (Household visits), 47% (DIY Workshops) and 55% (Health workshops) of the participants, which also demonstrated a fair interest of women in the energy poverty topic. Both, DIY and Health workshops were held in public festivals, which explains the almost equal distribution between men and women in these activities. On the other hand, collective assemblies and household visits were addressed to specific groups in situation of financial vulnerability, which might explain the higher share of women participants.

Regarding women empowerment indicators, data from the Household visits (Figure 8) show that men are more represented in decision-making regarding energy at home, as despite being less represented among participants, more men than women reported to be in charge of paying bills, make decisions regarding energy services, and being the contract holder. This pilot also shows a big share of households – in comparison to other pilot locations – were both partners take decisions regarding basic supplies and are equally appointed as service contract holders.

In DIY workshops (Figure 9), the share of women in charge of decision-making regarding energy supplies is significantly lower than for Household visits (22% versus 34%), a trend also observed in the share of women as service contract holders and in charge of paying the bills. These results might be related to the share of women participants for these activities, which was lower than in collective assemblies.



**Figure 8. Gender indicators for Household visits in Padova pilot site (n = 116).**



**Figure 9. Gender indicators for DIY workshops in Padova pilot site (n = 32).**

### Health indicators

Health indicators from Padova are available for the Household visits and DIY workshops attendees as shown in Figure 10 and Figure 11. It is important to notice that not all participants in the implemented actions answered the requested survey, which narrows the sample size to understand health issues in households affected by energy poverty. Furthermore, a high number of respondents did not feel comfortable sharing information about their health status and prefer not to answer the questions.

From the responses, only a small share from the Household visits reported to have poor (6%) health conditions. Within this same group, 14% reported to have a fair health condition, whereas in DIY workshops only 5% shared the same status. In both cases, a higher number of attendees reported to have good or very good conditions, although this group was considerably higher in DIY workshops than in Household visits, which is expected as the second action was particularly addressed to households in situation of financial vulnerability. Regarding longstanding illness or health problems, a higher share of respondents from Household visits (26%) also reported to suffer from this issue than in DIY workshops (11%). Also, within the first group, more respondents do not feel at ease with disclosing this information (47%), which reduces the number of participant households from which this information is known.

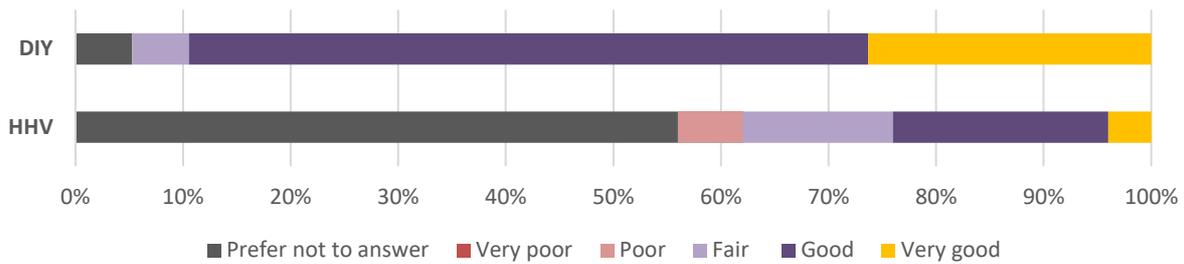


Figure 10. Self-reported health condition from participants in Household visits (n = 50) and DIY workshops (n = 19) from Padova pilot.

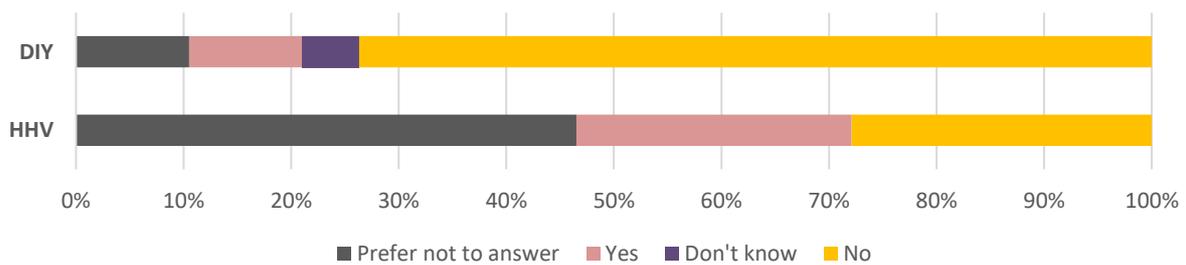


Figure 11. Longstanding health issues status from participants in Household visits (n = 43) and DIY workshops (n = 19) from Padova pilot.

### Efficiency indicators

Efficiency indicators (Table 12) are calculated for the Household visits action where data about implemented energy saving actions was provided. The average euros saved per euros invested is 0.65, when no labour cost is considered. By accounting for these costs, the action might not be cost effective as currently implemented, given that 1.71 euros are estimated to be saved per hour of labour invested, and the latter has an average cost of 29.3 euros for Italy's current conditions<sup>1</sup>. Even when considering below average costs, the hourly labour cost is likely to be above the estimated euros saved. It must be noted that the actions in Padova were negatively influenced by Covid-19, which reduced the expected number of participants and under normal conditions the same level of effort would have likely resulted in higher energy and cost savings.

Regarding DIY workshops, their implementation of DIY activities required around 128 hours of labour carried out by a group of 12 different people, leading to an average of 6.73 hours of labour per household. This is the only KPI calculated for this action as seen in the table below.

<sup>1</sup> Value obtained from the labour cost levels by NACE Rev. 2 activity reported for Italy in 2021 by



**TABLE 12. Efficiency indicators for Padova pilot site.**

KPI	HHV	DIY
Euros invested per HH [€/HH]	64	-
Labour hours per HH [h/HH]	24	6.7
Energy savings* per energy adviser [kWh/adviser]	407	-
Energy savings* per labour hours [kWh/h]	2.6	-
Energy savings* per euros invested [kWh/€]	4.7	-
Euros saved per energy adviser [€/adviser]	56	-
Euros saved per labour hours [€/h]	1.7	-
Euros saved per euros invested [ $\frac{\text{€}_{\text{saved}}}{\text{€}_{\text{invested}}}$ ]	0.7	-

CA: Community approaches, HHV: Household visits, DIY: Do-It-Yourself workshops, SFS: Support for financial schemes, HW: Health workshops.

\*Includes heat and electricity.

## 2.5 Slovenia (Obala)

As most of EmpowerMed’s pilots, five actions were implemented in Obala: Community approaches, Household visits, DIY workshops, Support for small investments and Health workshops (Table 13). As part of the first strategy, five collective assemblies were held in collaboration with local associations focusing on sharing information about energy usage and raise awareness about energy and water saving strategies. At the end of the sessions, attendees received a LED lightbulb whose utilization impacts positively in the project’s KPI as seen in the table below. A booklet with further suggestions to save energy and water at home was also distributed among workshops’ participants, but their implementation cannot be confirmed so no savings associated to these actions are accounted in the project KPIs. Still, it is viable that some were achieved as a result of this action, particularly considering that 100% of attendees responding the satisfaction survey stated that the material distributed was useful to them.

A total of 190 households were reached as part of the Household visits action done in the Obala pilot. As observed in Table 13, this resulted in total water savings of 1,261 m<sup>3</sup>/year, electricity savings of 35.0 MWh/year and heat savings of 33.9 MWh/year, which translates into 11,977 euros saved and 24.7 tonnes of CO<sub>2</sub> avoided each year. As happened with other pilots, the Household visits had the most impact on the stated project KPIs due to its practical action approach against the informational nature of other implemented strategies.

During the DIY Low-cost measures workshops, four sessions were carried out in collaboration with local educational and cultural organizations, gathering a total of 88 attendees. As done in the Community approaches, during the third DIY session, each of the 36 participants received a LED lightbulb to be used at home, which resulted in the energy, cost and emissions savings reported in Table 13. It is also possible that further actions leading to energy savings could have been implemented as a result from the workshops. However, there is no information to confirm it, so they are not computed in the values shown in Table 13.

**TABLE 13. Overall results for Obala pilot site.**

KPI	CA	HHV	DIY	SFS	HW	Total
Participants (women)	98 (62)	190 (135)	88 (59)	16 (10)	17(14)	409 (280)
Electricity savings [kWh/year]	2,156	35,034	792	0	0	37,982
Heat energy savings [kWh/year]	0	33,866	0	0	0	33,866
Energy savings* [kWh/year] (%women)	2,156 (63%)	68,900	792 (60%)	0	0	71,848
Water savings [m <sup>3</sup> /year]	0	1,261	0	0	0	1,261
Primary energy savings [kWh/year]	4,187	126,424	1,568	0	0	132,179
Cost savings [€/year] (%women)	365 (63%)	11,977 (68%)	133.9 (60%)	0	0	12,476
People free of debt [persons]	0	0	0	0	0	0
CO2 savings [kgCO <sub>2</sub> /year]	1,078	24,688	396	0	0	26,162

CA: Community approaches, HHV: Household visits, DIY: Do-It-Yourself workshops, SSI: Support for financial schemes, HW: Health workshops.

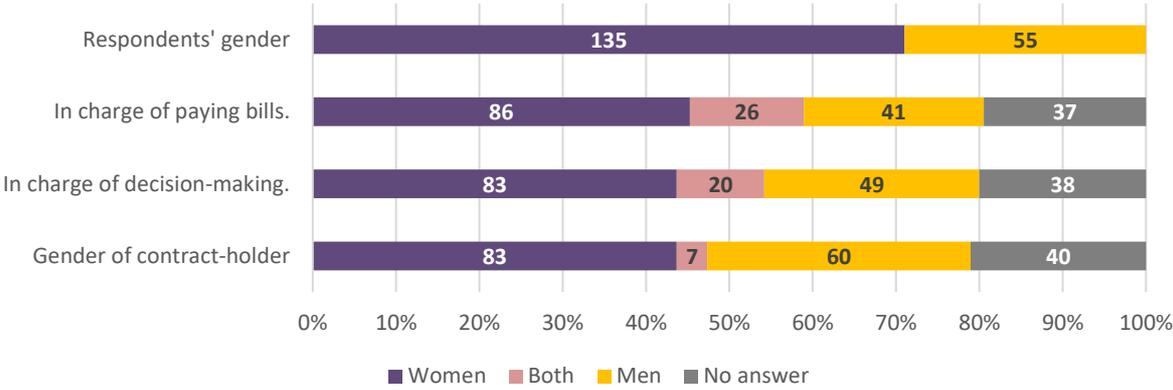
\*Includes heat and electricity.

As stated in Table 13, Support for financial schemes was provided to 16 households, 10 of which were women-led. It must be noted that all of these households also participated in other implemented actions: nine took part of the Household visits, six attended DIY workshops, and one participated in the Collective assemblies. In this sense, the Support for financial schemes could be understood as an additional aid offered to EmpowerMed's participants in the Slovenian pilot, functioning as a complementary tool to other actions. The support was provided via telephone calls, offering practical information about PV solar installations, in particular, the use of net-metering schemes and potential subsidies for individual and community systems; ENSVET energy advising scheme; Eco fund subsidies programs to renovate space and water heating systems, and building insulation, acquiring heat pumps and thermal solar devices; Eco fund calls for energy poor households (Zero500 and heating system revamping); and investments in the context of high energy prices. As no follow-up calls were made to confirm investments done as part of this action, no energy or cost savings are accounted although, in reality, some might have been achieved. Contrary to other pilots, the Slovenian Health workshops focused on medical practitioners (specifically, patronage care nurses) rather than EP-affected persons. The workshop's goal was to raise awareness about the link between energy poverty and health, which indirectly benefits people affected by this issue as medical staff is in better position to support them. Due to the scope of this action, no practical KPIs are calculated except for the number of participants.

### Gender indicators

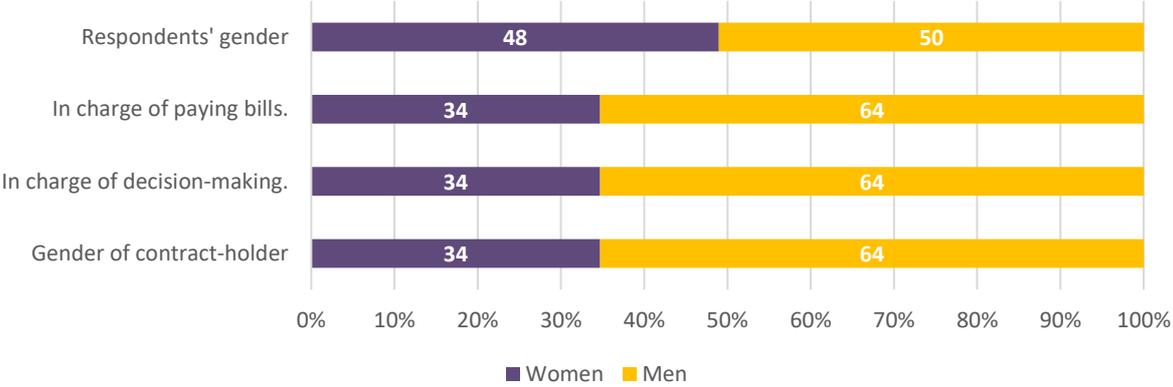
Women's participation in the Slovenian pilot was high in all actions but especially in Household visits and Health workshops in which they represented 71% and 82% of the participants. As mentioned before, Health workshop were addressed to nurses, a profession where women tend to be overrepresented, which explains the particularly high levels of female attendance. Regarding women empowerment indicators among household visits' participants, it is observed that a lower percentage of women indicates to be in

charge of supplies decision-making at home, both alone or together with a man, and even a lower share states to be the contract-holder. On the contrary, the number of households reporting to have a man as the contract holder is higher than the male respondents, which indicates that some of the women participants might not be able to change their contract conditions if needed. Still, the number of women that are in charge of paying bills, alone or together with a man, are similar to the number of participants.



**Figure 12. Gender indicators for the Household visits in Obala pilot site (n=190).**

In Community approaches, women participation was also relevant, accounting for 63% of the total participants. The participants were local residents interested in energy topics and contacted through the partner organizations’ channels. As three of the five partners were pensioners’ organizations, an important share of the attendees were senior citizens. According to the indicators presented in Figure 13, only 35% of households had women contract holders and in charge of decision making and paying utilities bills, which is less than half the share of women participating in the activity. As mentioned for other pilots, this discrepancy might affect the project effectiveness as some suggestions received by women participants might not be finally implemented as they are not in position to decide over their household’s energy supply.



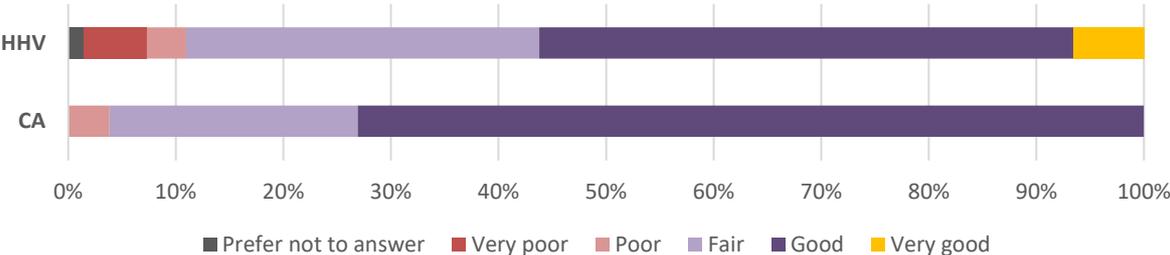
**Figure 13. Gender indicators for the Community approaches in Obala pilot site (n= 98).**

Finally, in DIY Low-cost measures women represented 63% of the total attendees. Assistants to the Low-cost measures were mostly local residents from Obala contacted

through cultural and educational organizations.

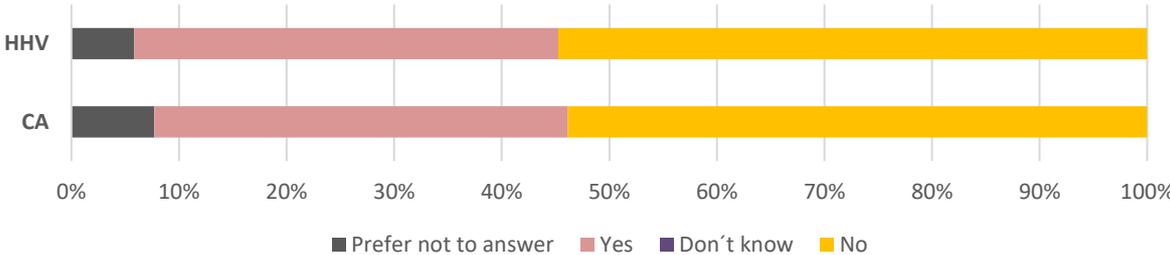
**Health indicators**

Health indicators are available for the Household visits and Community approaches participants. It is relevant to note that only a small share of respondents expressed to have poor or very poor health condition, although the share is even lower for Community approaches participants, in which only 4% reported a poor health condition. In the case of Household visits, the same percentage of households reported to have poor health conditions, but an additional 6% expressed to have very poor health as can be observed in the figure below.



**Figure 14. Self-reported health condition from participants in Household visits (n = 137) and Community approaches (n = 26) from Obala pilot.**

Surprisingly, a higher share of participants (39% for Household visits and 38% for Community approaches) mentioned to have a longstanding illness or health issue as seen in Figure 15. This group might be represented in the percentage of respondents indicating to have fair health condition, which might be in reality poor or very poor depending on the nature of the illness. However, the survey is based on self-perception so it is not medically accurate, but only a reference to the link between energy poverty and health.



**Figure 15. Longstanding health issues status from participants in Household visits (n = 137) and Community approaches (n = 26) from Obala pilot.**

**Efficiency indicators**

Efficiency indicators are calculated for the Community approaches, Household visits and DIY workshops from which savings data was reported. As seen in Table 14, Household visits require the largest investment per household, but also report the least intensity in terms of labour hours and human resources invested. Still, in purely economic terms, it is the least efficient activity, as only 10 cents are saved per euro invested. This is even less

optimistic when considering the labour hours per household needed for this activity and the average cost of labour per hour in Slovenia (21.1 euros as stated in Table 5).

Community approaches and DIY workshops require less economic investment but more hours per participant. They also represent a lower impact in terms of energy and cost savings per human resources effort. Although the euros saved per euros invested in these activities are higher than for Household visits – given the much lower investment needed – the amount is not enough to cover the labour hours required if the average cost of work in Slovenia is considered. This means that if people need to be hired to replicate this action in other Slovenian regions, the cost of implementation might be higher than the potential economic savings.

**TABLE 14. Efficiency indicators for Obala pilot site.**

KPI	CA	HHV	DIY
Euros invested per HH [€/HH]	0.77	36.4	0.9
Labour hours per HH [h/HH]	1.4	2.4	0.6
Energy savings* per energy adviser [kWh/adviser]	359.3	13,780	645.3
Energy savings* per labour hours [kWh/h]	15.3	150.8	39.5
Energy savings* per euros invested [kWh/€]	28.8	10	25.8
Euros saved per energy adviser [€/adviser]	60.8	2,395	109.1
Euros saved per labour hours [€/h]	2.6	26.2	6.7
Euros saved per euros invested [ $\frac{\text{€}_{\text{saved}}}{\text{€}_{\text{invested}}}$ ]	4.9	0.1	4.4

CA: Community approaches, HHV: Household visits, DIY: Do-It-Yourself workshops, SFS: Support for financial schemes, HW: Health workshops.

\*Includes heat and electricity.

## 2.6 Spain (Barcelona)

The Barcelona pilot-site actions are planned around collective assemblies. These assemblies aim to empower people to face the multiplicity of problems that come from energy poverty and how to alleviate them. Collective assemblies take place every 15 days and, since COVID-19 crisis came in, they use a hybrid in-person and virtual strategy to keep on fighting. Note that the focus of this pilot site is non-invasive, that is, the aim is that affected household are the ones approaching to the different activities by calls and announcements and no-one will enter into anyone else's house or intimacy. That is why this is the only pilot site not having household visits.

From the October of 2019 until April of 2023 a total of 1,476 people participated in 63 sessions from the Community approaches, achieving estimated cost savings of € 31,075, with an average of € 555 saved per session. Besides, 21 people have been freed from debt thanks to the accompanying and campaigning actions done as part of the project (60 accompaniments were carried out in total during the project duration, 46 of which directly benefitted affected women). This resulted in debt condonation for 21 people directly involved in the Community approaches, which represent up to 18,301€ (37% of the total savings achieved for this action). No energy or emissions savings are accomplished (Table 15) as actions arising from collective assemblies focused mostly on helping affected people to optimize their bills, access financial help (basically through helping them to access the

“bono social” – a social aid to deduct a percentage of the gas and electrical bills from families in situation of financial vulnerability– which represent a 21% of the total savings reached in collective assemblies) and use their rights as vulnerable consumers.

**TABLE 15. Overall results for Barcelona pilot site.**

KPI	CA	DIY	SFS	HW	Total
Participants (women)	1,476 (860)	29 (22)	60 (40)	152 (101)	1,717 (1,023)
Electricity savings [kWh/year]	-	-	-	-	0
Heat energy savings [kWh/year]	-	-	-	-	0
Energy savings* [kWh/year] (%women)	-	-	-	-	0
Water savings [m <sup>3</sup> /year]	-	-	-	-	0
Primary energy savings [kWh/year]	-	-	-	-	0
Cost savings [€/year] (%women)	49,376 (60%)	546 (76%)	9,560 (68%)	-	59,482 (61%)
People free of debt (women)	21(15)	-	15 (10)	-	36 (25)
CO2 savings [kgCO <sub>2</sub> /year]	-	-	-	-	0

CA: Community approaches, DIY: Do-It-Yourself workshops, SFS: Support for financial schemes, HW: Health workshops.

\*Includes heat and electricity.

It is from the collective assemblies that satellite actions, such as the DIY and Health workshops gain relevance. Health workshops in Barcelona could also be considered as an extension of the Collective assemblies in which people affected by energy poverty share experiences and feelings among their peers, with a therapist guidance. Contrary to Collective assemblies where attendees share their problems and experiences with the purpose to create collective knowledge and provide practical solutions, attendees to Health Workshops are only expected to share their feelings and ideas in a safe space, so they can vent and feel accompanied by others during times of hardship. During the 21 sessions held from October 2021 to April 2023, a total of 152 people signed as attendees, from which 66% were women. It must be noted that 43% of the sessions were held online and 23% face-to-face, the rest were conducted using a hybrid format.

As part of Health workshops, a Thermal comfort campaign was carried out at the Barcelona pilot in parallel to the DIY – Smart meter action. That is, at the same time and with the same people (whenever possible) participating in both initiatives. To gather participants, it was announced at the start of collective assemblies that people was welcome to go to a separated space next to the assembly’s room where a team in charge of the activities was waiting to assist volunteering users. A total of 29 people signed up to the Thermal comfort campaign, 72% of where women. These participants are accounted as part of Health workshops from which this action derives; no financial or energy savings are reported for this action although some practical advice about ventilation best practices was provided to interested participants.

On the other side, DIY smart-meter action resulted in the additional financial savings shown in Table 16, whereas the number of participants (and the share of which are women) can be consulted in Table 15. Note that DIY smart meter actions ended before June 2021, just

before a change in tariffs in the Spanish government and before the uncontrolled increase of electricity costs. Therefore, the advice given and the cost savings estimations were based on previous tariffs. The following table reflects the estimated savings from 19 out of the 29 participants whose participation was early enough to obtain a benefit from changing their contracting conditions. For the rest of participants, a report analysing their consumption over the newly defined pricing periods was provided, as well as some tips to save money by consuming more during low-price hours. However, no savings can be estimated from this group.

**TABLE 16. Results from the DIY workshop for EP-affected (n=10) and non-affected groups (n=9).**

<b>Electricity Expenses Metrics*</b>	<b>EP</b>	<b>Non-EP</b>
Average household electricity expenses without the discount from the social bonus [EUR/year]	413	522
Average household electricity expenses considering the discount from the social bonus over vulnerable consumers [EUR/year]	321	522
Average percentage of the electricity bill corresponding to contracted power [%]	52%	57%
Expected average cost reduction per household with the suggested changes [EUR/year]	42	126
Number of users recommended to change to a regulated company.	1	9
Number of users recommended to change from a flat to a TOU regulated tariff.	4	9
Number of users recommended to lower their contracted power.	1	0

\*Calculated using the electricity monitoring tool developed expressly for the DIY workshops. Source: own elaboration based on field data.

Finally, Support to financial schemes workshops were implemented in 18 different sessions in which the new guidelines on social aids and financial schemes for energy efficiency measures were discussed with attendees. Although the EmpowerMed project in Barcelona’s pilot site accounted 21 debt condonations registered thanks to Collective assemblies, we want to attribute to the project part of the 35.000 debt condonations occurred in Catalonia thanks to the agreement reached between Endesa (main utility in the region) and the Generalitat de Catalunya (2021) after the massive pressure of energy activists. In this sense, 25 of the 60 accompaniments done were conducted during this period to regularize the connection of basic services, reaching an agreement in 15 cases (63% success rate). This is considered as part of the Support to financial schemes workshops and resulted in estimated cost savings of € 9,559.

**Gender indicators**

Women participation in Barcelona’s Community approaches is active, representing 58% of the participants as seen in Figure 16. Moreover, contrary to other pilots, women empowerment indicators show an active participation of women also in rising issues and proposals during the Collective assemblies as 61% of the people speaking during the sessions were female. From the people that indicated the gender of the person to which

the energy bills are addressed, 72% mention that a woman is the contract holder, which indicates that women in the Barcelona pilot might be more empowered to make decisions regarding their energy supplies than their counterparts in other pilots.

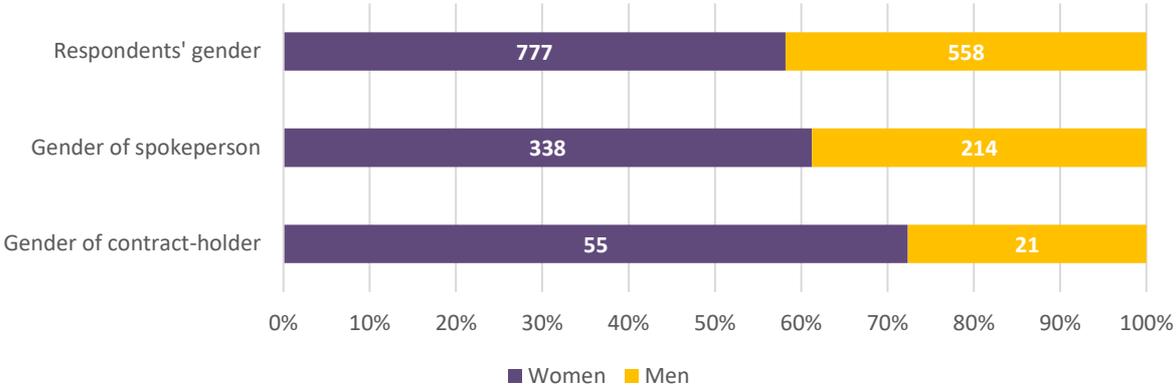


Figure 16. Gender indicators for the Community approaches in Barcelona pilot site (n =1335).

Health indicators

During collective assemblies, assistants were encouraged to share their concerns and talk about physical and mental health problems related to energy poverty. Answers are not recorded to respect privacy and the sense of trust, but the gender of the person sharing their concerns is register for statistical purposes. With this data, it is relevant to notice that most of the persons sharing physical and mental health concerns at the sessions were women (74%). Men seem to be more reluctant to discuss these issues in public, even within a trusting environment.

Results from a survey responded by 18 (13 women) of the participants to the health workshops organized in Barcelona show that 50% of participants have a disability and 72% suffer of a chronical illness. Furthermore, 78% of respondents mention to be limited up to different extents to conduct their day-to-day activities due to their health issues.

The environmental comfort monitoring campaign, held as part of the Health workshops in Barcelona, evaluates thermal comfort and air quality through a measurement campaign of 10–15 days, where indoor air temperature, humidity and CO<sub>2</sub> concentration are monitored. In total, 14 EP-affected and 13 non-EP affected households have been participated in the campaign.

As Figure 17 shows, the analysis of the monitored thermal comfort data for the 27 households (c-d) suggests minor differences between EP and non-EP households. However, if wintertime thermal comfort perceptions (a-b) are compared, a significant difference between groups emerge, as EP-affected persons report worse thermal conditions at home (an average of 3.6/10 thermal comfort perception, compared to 5.7/10 for non-EP persons; 93% of EP households cannot keep home adequately warm in winter, compared to 46% of non-EP households). Regarding indoor air quality, EP-affected households present worse levels despite the adequate natural ventilation habits of the occupants. Two main reasons could cause that situation: 86% of the EP-affected households are occupied almost all day, and 36% use butane heaters.



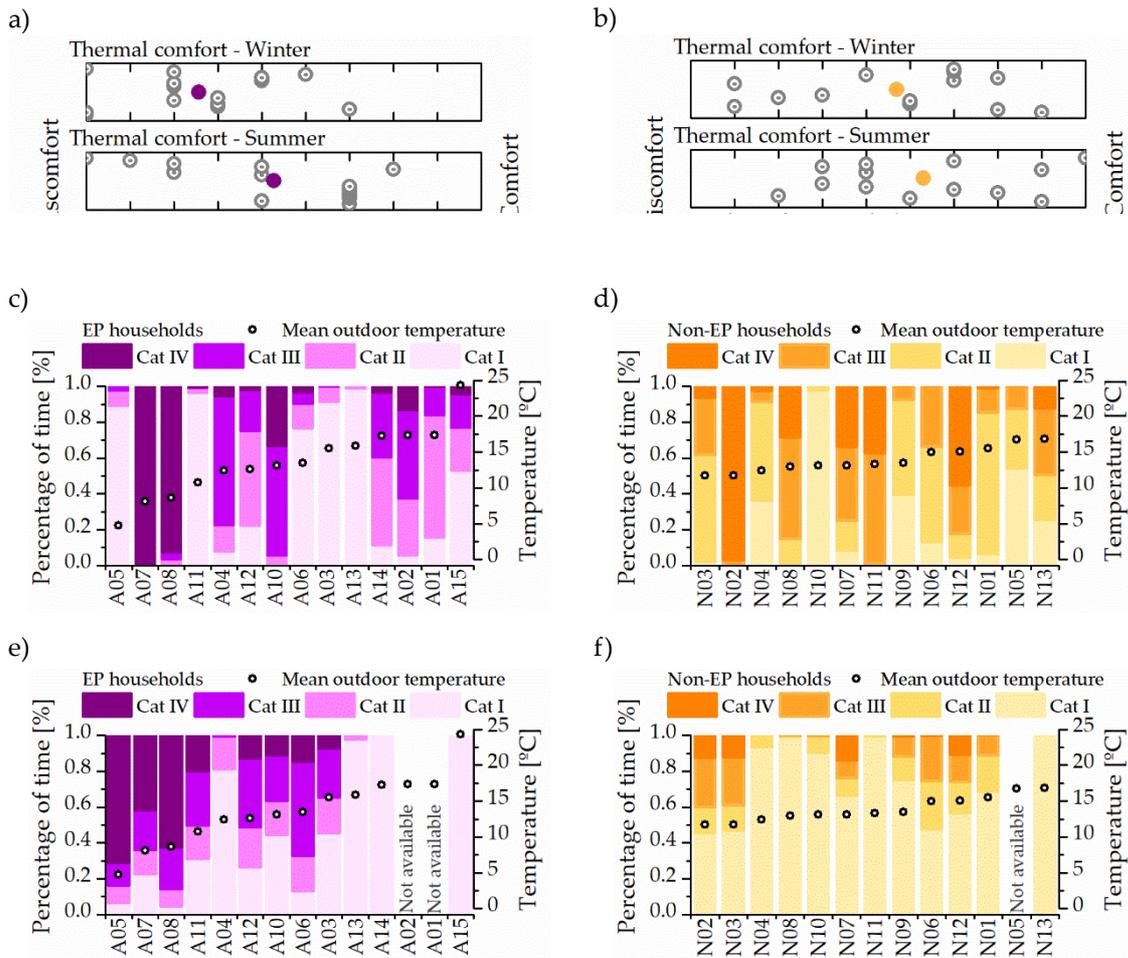


Figure 17. a-b) Thermal comfort perception of EP (left) and non-EP (right) affected persons, being 1 discomfort and 10 comfort. Grey dots represent the answers of each person, and purple/yellow dots are the average value of EP and non-EP. c-d) Percentage of time in each thermal comfort categories based on adaptive model and e-f) percentage of time in each air quality category based on CO<sub>2</sub> concentration, for each EP (left) and non-EP (right) households. Monitored households are sorted by mean outdoor temperature, represented by holed dot (right axes).

### Efficiency indicators

As summarized in Table 17, Community approaches had the highest impact in terms of economic savings without supposing large investments in terms of money or human resources. As Support for financial schemes are done in a similar fashion to Collective assemblies, the obtained efficiency indicators also show a positive outcome although lower than for Community approaches. In particular, the latter reported low efficiency in terms of savings per energy adviser. Nonetheless, most of the volunteering users are the same as for Community approaches and both actions are run in parallel, so in reality, fewer people might be needed if only Support for financial schemes were to be replicated following Barcelona's approach. Finally, DIY workshops offered the lowest impact and was a labour-intensive activity, in terms of dedicated hours. As explained, regulatory changes in Spain affected negatively this action, reducing the potential benefits achieved through it.

**TABLE 17. Efficiency indicators for Barcelona pilot site.**

KPI	CA	DIY	SFS
Euros invested per HH [€/HH]	0.0	0.3	0.3
Labour hours per HH [h/HH]	0.6	25.8	2.9
Energy savings* per energy adviser [kWh/adviser]	-	-	-
Energy savings* per labour hours [kWh/h]	-	-	-
Energy savings* per euros invested [kWh/€]	-	-	-
Euros saved per energy adviser [€/adviser]	9,875	182	109
Euros saved per labour hours [€/h]	62	0.7	95.6
Euros saved per euros invested [ $\frac{\text{€}_{\text{saved}}}{\text{€}_{\text{invested}}}$ ]	4,938	55	956

CA: Community approaches, DIY: Do-It-Yourself workshops, SFS: Support for financial schemes.

\*Includes heat and electricity.

### 3 RESULTS PER ACTION

The results obtained in each action are compared in this section for the different pilots that have implemented them during the project. The comparison for Community approaches, Household visits and DIY workshops compares the participation levels and the KPIs and efficiency indicators obtained in each location where data was available. For those who follow a more informative approach, without direct savings accounted, a qualitative comparison is also presented. The gender dimension is included by considering women participation and empowerment data. For the Support to small investments and Health workshops actions, only qualitative assessment is done, incorporating the results obtained from the health perception survey in the latter.

#### 3.1 Community approaches

Community approaches were implemented in all of EmpowerMed pilots. The implementation of this action was done in six general steps as reported by the partners and summarized in Figure 18. The local actors' engagement (Step 1) was more time-consuming for the pilots where collective assemblies were new, but even in Barcelona – where stakeholders were already engaged – this is an ongoing process that continues along with the assemblies' preparation.



**Figure 18. Community approaches implementation process**

Steps 2 (Material preparation) and 3 (Event organization) are done simultaneously in some pilots, particularly those where each collective assembly focus on a different topic. In others, the preparation of reference material takes more effort as it is intended to last a longer time or is designed to support affected people navigating bureaucracy or administrative barriers and not just to raise awareness about certain topics.

Participants engagement (Step 4) is done through different channels depending on the site. In Barcelona, where collective assemblies are held continuously, own channels are mostly used. In the rest of the pilots, communication with potential participants relies mostly on the local stakeholders' channels, which already have access to a wide network of potential participants. Additionally, traditional communication means (e.g. posters, flyers) are also used in greenfield pilots.

The assembly's implementation (Step 5) takes place with different periodicities depending on the pilot, although the event's average duration is two hours for practically all places. Participants' feedback is gathered in most pilots through a survey (Step 6). Finally, in two of the cases, post-event support (Step 7) is done, although different approaches are followed depending on the site. In Barcelona, it consists on accompanying people that feels powerless or hesitant to reclaim their rights as a vulnerable consumer. In Italy, it involves replying to participants' follow-up questions via e-mail.

### Results achieved

In Barcelona (Spain), collective assemblies are built as sessions in which people exchange information about energy poverty issues and practical actions to address them, which are put into action sometimes with the support of the pilot's volunteers. Most of these actions are focused on reducing energy costs, accessing social aids, and claiming their rights as vulnerable consumers, such as being freed of debt. For this reason, Barcelona's Community approaches results in the highest cost savings and the only pilot with people free of debt (Table 18), but no energy or emissions savings are achieved.

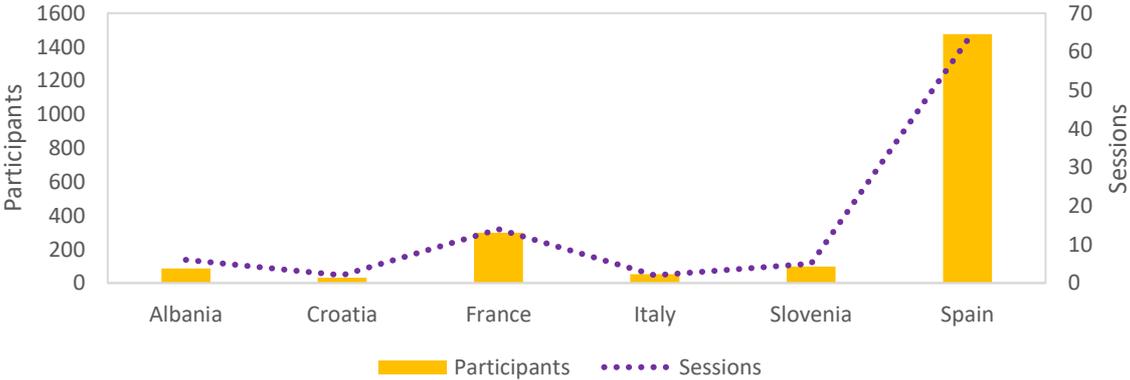
**TABLE 18. Overall results for Community approaches.**

KPI	Albania	Croatia	France	Italy	Slovenia	Spain
Participant households (women-led)	86 (70)	31 (20)	298 (162)	53 (38)	98 (62)	1,476 (860)
Energy savings* [kWh/year]	-	-	-	-	2,156	-
% Electricity savings	-	-	-	-	100%	-
% Heat savings	-	-	-	-	0%	-
Water savings [m <sup>3</sup> /year]	-	-	-	-	0	-
Primary energy savings [kWh/year]	-	-	-	-	4,187	-
Cost savings [€/year]	-	-	-	-	365	49,376
People free of debt [persons]	-	-	-	-	0	21
CO2 savings [kgCO <sub>2</sub> /year]	-	-	-	-	1,078	-

\*Includes heat and electricity.

The rest of the pilots took a more informational approach, in which collective assemblies are used to share information about energy poverty and raise awareness about potential solutions, although no direct action is taken. The only exception is Obala (Slovenia), where an efficient lighting device was handed to participants, resulting in the cost, energy and emissions savings shown in the table above.

The pilot in Barcelona (Spain) was the most prolific in terms of participants and sessions held as it is the only case in which collective assemblies were already an on-going activity, and not a strategy to be implemented from scratch as in all other pilots. As expected, the number of sessions is highly related to the number of participants, but some pilots are more efficient than others in attracting people to participate in the assemblies. Italy only held two sessions, but managed to get 26.5 people per assembly, whereas Croatia with the same number only had 15.5 people per session (Figure 19).



**Figure 19. Number of participants and sessions held in each pilot (mean number of participants per sessions shown in number).**

The latter might be explained by the size of the partner organizations participating in the project. For instance, those contacted in Italy already had a large beneficiaries’ database, which helped to reach hundreds of potential households without much effort. Instead, other

pilots relied on smaller partners and had to carry their own communication campaign (for instance, in France. The fact that Barcelona’s collective assemblies were already an established activity, with its own communication networks, also impacted positively in the participants’ rate per session (23.4), which was almost as high as in Italy (26.5). The number of women participants was relevant for all locations, representing 59% share of the total Community approaches’ participants. Nonetheless, the share of women participants varies per pilot as shown in Figure 20, being France and Spain those with the lowest (although they still represented over half of participants), and Albania the pilot with the highest share of female participation.

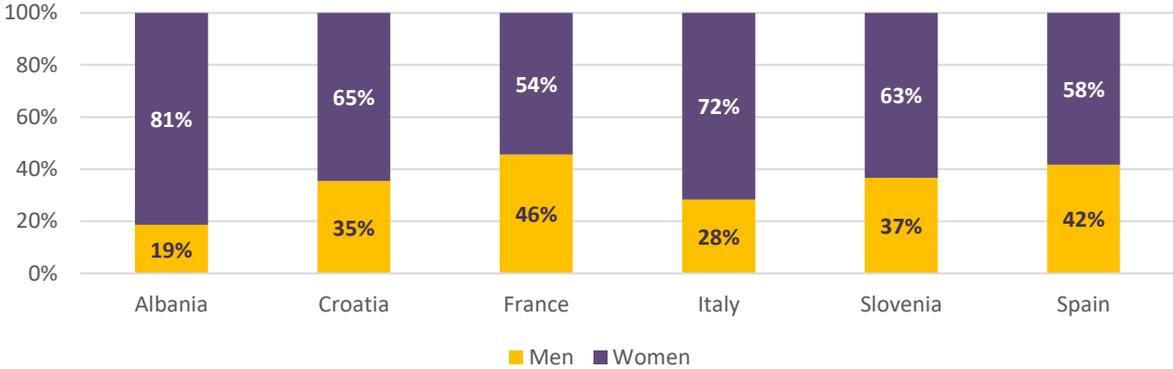


Figure 20. Share of participants per gender in the Community approaches action (%women).

Resources analysis

The resources needed to implement Community approaches varies depending on the location as reported by partners during the activity held in the General Assembly of March 2022. However, some similarities were found, for instance regarding the number of staff. Most of the pilots required only two to three people to perform the most critical steps (Step 3 – event organization, and Step 5 – Implementation), whereas the rest could be handled by one or two staff members.

Similarly, the skills required from people participating in this action were pretty similar for all pilots. In particular, soft skills such as communication and organizational traits are required by all. For technical skills, all pilots – except Barcelona – mentioned knowledge about energy poverty and energy saving solutions as desirable. The approach used in Spain, which focuses on using existing social aids and protocols addressed to vulnerable consumers as well existing market options to relieve households’ energy expenses, requires people with knowledge of energy markets and laws.

As explained before, the actual event lasts two hours in all cases, but the organization and preparation of reference material takes different time efforts depending on the pilot’s approach. For instance, in Albania weeks were required to prepare the material as it would be used continuously for several meetings; in Italy, a few days’ efforts were reported for the same activity as they were going to be used in a set of specific sessions; and in Spain, an effort of 3 hours per week was reported to review common cases presented during the collective assemblies’ sessions held and prepare reference material to address these issues.

The efficiency issues calculated for Slovenia and Spain (Table 19), the only pilots were

energy and cost savings were reported, show that the approach followed in Slovenia was more resource intensive. One energy adviser in Slovenia translated into 61 euros saved, whereas in Spain this quantity was over 161 times that amount. Similarly, in Slovenia, one hour of work resulted in €2.6 saved (which is much lower than €21.1 the average labour cost in this country), while in Spain the same hour would result in €62, which almost triple the average labour cost in that country (€22.9).

**TABLE 19. Efficiency indicators for Community approaches.**

KPI	Slovenia	Spain
Euros invested per HH [€/HH]	0.8	0.0
Labour hours per HH [h/HH]	1.4	0.6
Energy savings* per energy adviser [kWh/adviser]	359	-
Energy savings* per labour hours [kWh/h]	15	-
Energy savings* per euros invested [kWh/€]	29	-
Euros saved per energy adviser [€/adviser]	61	9,875
Euros saved per labour hours [€/h]	2.6	62
Euros saved per euros invested [ $\frac{\text{€}_{\text{saved}}}{\text{€}_{\text{invested}}}$ ]	4.9	4,938

\*Includes heat and electricity.

However, when looking at both pilots' results, it should not be forgotten that in Barcelona collective assemblies already were already an ongoing initiative before the EmpowerMed project, while in Slovenia they were implemented from scratch. Moreover, in Spain, there are already some regulatory mechanisms that protect vulnerable consumers and whose used can be promoted through community approaches, while also igniting action for political movements towards further solutions.

Furthermore, at the time of implementation, vulnerable consumers had different electricity tariffs to choose from in Spain while maintaining the access to the social discount. This means that they could achieve some savings by just choosing a different option<sup>2</sup>. In Slovenia, saving money by changing tariff or company was never feasible as energy prices are largely unified in the country, even though different retailers exist. These differences explain the discrepancies between the results achieved, and should be considered when analysing the economic results.

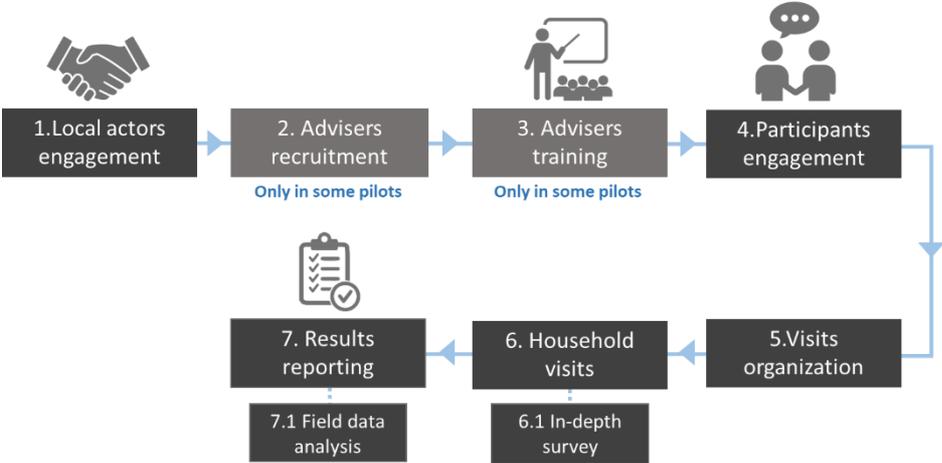
Regarding energy savings, the pilot in Obala is the only one impacting positively in this aspect. Delivering small efficient devices that people can install at home, while raising awareness about energy issues is an easy and quick way to save energy. Similar strategies could be implemented in the other pilots that implement Community approaches with an informational approach, particularly in places where efficient lighting is not yet widespread.

## 3.2 Household Visits

Household visits are implemented in all pilots except Barcelona. From the actions implemented as part of EmpowerMed, Households visits are the most consistent across the

<sup>2</sup> Now, however, a regulatory change has left out this possibility in Spain as only one tariff is available for reference electricity retailers, whose prices are mandated by the government and are the only companies allowed to offer vulnerable customers the social discount.

different locations. According to the experiences reported by partners, Household visits are implemented in seven steps (Figure 21), although two are optional in case the process is supported by external energy advisers (Step 2 – Energy adviser recruitment and Step 3 – Energy adviser training).



**Figure 21. Household visits implementation process**

As with Community approaches, local actors and participants’ engagement are crucial parts of the process. The local actors involved in Household visits are representatives from local government or organizations with broad experience in the area. Their involvement is particularly important for those pilots where EmpowerMed’s pilot manager had little or no history working with the affected households, as Household visits require establishing trusting relationships as the actions are implemented directly at people’s homes. In this case, Step 1 and Step 2 can take several months to conclude as was the case for the Italian and Croatian pilots.

In Croatia and Albania, external energy advisers – not belonging to EmpowerMed or local partners – were recruited to assist in the household visits (Step 2). This required extra time, not only to recruit them but to train them (Step 3). However, this effort seems to pay off as the Zadar pilot was the one reaching the higher number of participant households. In the rest of the pilots, own staff was in charge of conducting the visits. In some cases, there were existing experience implementing similar actions, but in others training was still provided.

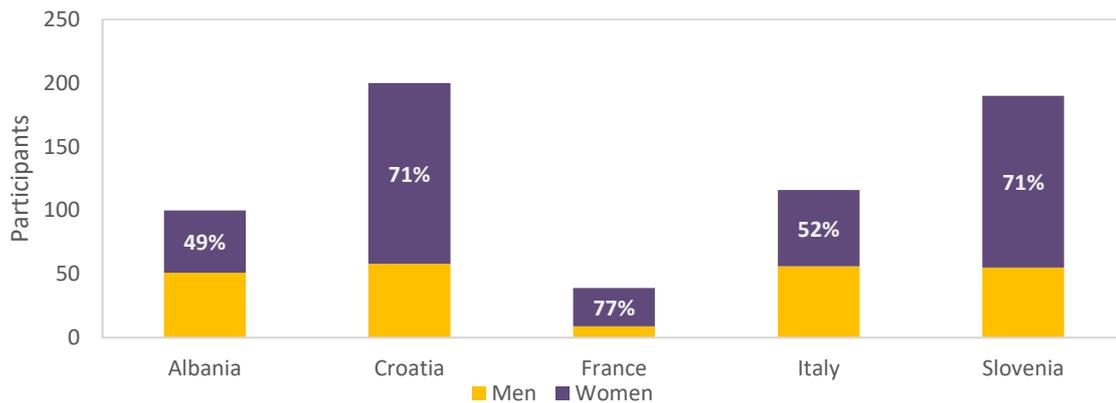
Participants engagement (Step 4) is done similarly to Community approaches, using local partner’s networks as well as traditional communication means (leaflets, posters, etcetera). The visits organization (Step 5) includes different activities depending on the pilot specific strategy, but in general they include organizing commutes, preparing the in-depth survey, reference materials and energy kits.

The Household visits campaign (Step 6) can last several months depending on the number of households involved and the length of the period in which households are recruited and allowed to express interest and sign up to the activity (Step 4). For those pilots that reported the time used for each individual visit, it is known that it takes between 45 minutes to 2 hours depending on the required interaction with the household owner. It must be noted that an in-depth survey is conducted during the visit to grasp more insights

about the household’s socio-economic characteristics and energy usage habits, and gather data to evaluate and report the project’s results (Step 7).

### Results achieved

The number of household participants vary from 39 in France, where the lowest number of households were involved, to 200 in Croatia, with the highest participation rates (Figure 22). For all EmpowerMed’s pilots, women represented 64.5% of participants from Household visits, Albania being the pilot with the lowest share of female participants, and Croatia and Slovenia the locations with the highest (71% in both cases).



**Figure 22. Number of participants per gender in the Household visits action (%women).**

As this activity focused on implementing energy saving actions at affected households, it resulted in energy, cost and emissions savings in all locations where they were used (Table 20). As observed, water savings are reported in Albania, France, Italy and Slovenia. Croatia reports no water savings achieved as part of EmpowerMed’s pilots. Vlore (Albania) pilot is the one reporting the highest water savings, which almost doubles those reported for Obala (Slovenia), and almost triples those accounted in Marseille (France) and Padova (Italy).

**TABLE 20. Overall results for Household visits actions.**

KPI	Albania	Croatia	France	Italy	Slovenia
Participant households	100	200	39	116	190
Energy savings* [kWh/year]	112,426	880,922	18,918	73,143	68,900
% Electricity savings	58%	87%	57%	19%	51%
% Heat savings	42%	13%	43%	81%	49%
Water savings [m <sup>3</sup> /year]	2,227	0	519	3,710	1,261
Primary energy savings [kWh/year]	214,555	1,336,756	36,731	99,889	126,424
Cost savings [€/year]	9,922	94,624	3,022	145,304	11,977
CO2 savings [kgCO <sub>2</sub> /year]	51,135	188,871	2,706	20,754	396

\*Includes heat and electricity.

Relevant differences among the average savings per household reported in the different pilots is observed. As this action is the most consistent across different pilots it is considered relevant to compare the results using savings per household and not for the



entire pilot. The impacts per household are presented in the table below. When looking at the individualized impacts, it is remarkable that Croatia is the pilot with largest energy and cost savings per pilot, followed by Albania. Italy and Slovenia are the pilots with the least energy and cost savings per household, while France is in the middle of both groups.

**TABLE 21. Household visits impact per household**

KPI	Albania	Croatia	France	Italy	Slovenia
Energy savings* [kWh/hh-year]	1,124	4,405	485	631	363
Water savings [m <sup>3</sup> /hh-year]	22	0	13	32	7
Primary energy savings [kWh/hh-year]	2,146	6,684	942	861	665
Cost savings [€/hh-year]	99	473	77	1,253	63
CO2 savings [kgCO <sub>2</sub> /hh-year]	511	944	69	179	2

\*Includes heat and electricity.

It must be noted that energy savings in Croatia corresponds mostly (87%) to electricity savings, whereas in Italy, the second pilot with most cost savings per household, heat savings represent the vast majority of savings achieved (81%). In Albania, France and Slovenia, the share of heat and electricity savings is more balanced, ranging from almost 50%-50% to 40%-60%. These discrepancies can be attributed to differences in the households' original state (insulation), type of fuels used in each country, and the type of equipment available in each home.

### Resources analysis

Based on estimations, the investment required to implement Household visits is highest for Croatia, where an average of €100 per household is required, and lowest in Slovenia, where costs are almost 50% of that of Croatia (Table 22). Albania presented similar costs levels to Slovenia, but it was more time-intensive. Still, Italy is the pilot where more time per household was invested (and the second most expensive pilot), while Croatia required similar hours to Albania. Slovenia is the pilot where least time per household was used.

**TABLE 22. Efficiency indicators for Household visits.**

KPI	Albania	Croatia	France	Italy	Slovenia
Euros invested per HH [€/HH]	44	100	-	64	36.4
Labour hours per HH [h/HH]	8.4	7.7	-	24	2.4
Energy savings* per energy adviser [kWh/adviser]	3,627	88,092	-	407	13,780
Energy savings* per labour hours [kWh/h]	134	571.3	-	2.6	151
Energy savings* per euros invested [kWh/€]	26		-	4.7	10
Euros saved per energy adviser [€/adviser]	320	9,462	-	56	2,395
Euros saved per labour hours [€/h]	12	61.7	-	1.7	26.2
Euros saved per euros invested [€ <sub>saved</sub> /€ <sub>invested</sub> ]	2.25	4.7	-	0.7	0.1

\*Includes heat and electricity.

The amount of savings achieved per staff involved (in this case, external energy advisers) was the highest in Croatia and lowest in Italy, while Albania and Slovenia are at similar levels. In all cases, except Italy, the costs saved per hour of work are superior to the country's mean labour costs, which indicates that the action might be cost effective even if the work is not done by energy advisers or staff whose payment is covered by other means. This is particularly true for Albania and Croatia when the difference among the hourly costs savings and hourly labour rate is significant. In Italy, the cost savings per hour are way below the labour costs in the country, which is partially explained by the low number of households reached in this location.

The number of people involved in the Household visits varies across locations as indicated in Table 4. Slovenia and Croatia required the least number of staff (5 and 10, respectively), while Albania and Italy required the most (35 and 45). It must be noted that in some locations – for instance, Italy – some of the people involved belonged to the municipality or other external organizations, whose purpose was not to implement the action itself but to facilitate its implementation as the pilot manager was not well-known in the area. These people, however, are accounted for in the total human resources needed as it is an indication of the higher efforts needed in this pilot to conduct the visits.

Finally, it is worth noting that the people actually in charge of implementing the measures at participating households are required to have soft skills such as good communicational traits, but also specific technical knowledge about energy-related topics such as energy poverty or energy auditing, and data analysis to do reporting. This knowledge can be already brought by the person or ensured by providing specialised training to the people involved.

### 3.3 DIY workshops

DIY – Low cost measures workshop is the most used workshop type across EmpowerMed's pilots, and one of the only two actions implemented in all locations. DIY PV panels are only implemented in Albania and Croatia, and DIY Smart-meters in France, Italy and Spain. Even within the same workshop type differences among the approaches taken by partners are observed. Thus, a unified implementation process cannot be described for these actions as it was done for Community approaches and Household visits. Still, in most cases, it follows a similar path to that of community approaches, without the recurrent nature. Moreover, the main difference between DIY Workshops and Collective assemblies is that in the first beneficiaries take a more passive role as information receivers but more hands-on experience by getting in touch with specific technologies or energy-saving strategies. In Community approaches, on the contrary, attendees are not only receiving information but sharing their own knowledge with others, building collective learning experiences.

#### Results achieved

As explained in Chapter 2 in which the actions implemented in each pilot were discussed, most of the DIY workshops focused on informing and raising awareness about potential ways to save energy, but no measurable results are available at this point. Only in Slovenia, where efficient light bulbs were distributed directly to attendees, energy savings could be quantified. In the rest, these are expected to happen as a result of behavioural changes or

small investments done as a result of the workshops, but no direct evidence of this is accessible at the moment.

Regarding DIY Smart-meter workshops, direct cost savings are only identified in Barcelona where this activity led to specific recommendations to optimize people’s energy bills and reduce costs by only changing contract conditions. Due to the difficulties accessing smart-meter data, this approach was not possible to follow in France and Italy, where a more didactic approach was followed instead. As happened with DIY Low-cost measures workshops, these actions might have led to energy, cost, and emissions savings but this could not be quantified at this point. Finally, DIY PV panels were only implemented in Croatia as a hands-on workshop were attendees could learn about the technology from a theoretical and practical approach.

The attendance to the different workshops varies across locations (Figure 23). Spain registered the least attendance from all pilots, which is explained by the nature of the activity implemented, which led to cost savings but required deeper commitment from participants than in the more educational workshops implemented elsewhere. From the rest of the pilots, Slovenia and France stand out for their high levels of participation. Women’s participation was the highest in Barcelona, although also relevant in the rest of the pilots, except for Croatia in which this group represented less than a third of participants. The low female involvement in this pilot was already associated in Chapter 2 with the workshop topic (in the STEM field) that tends to have more male representation due to gender stereotypes.

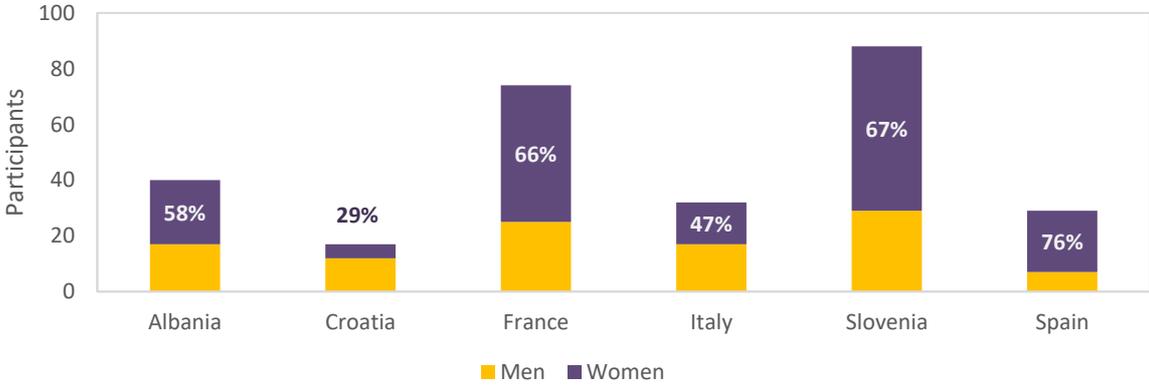


Figure 23. Number of participants per gender in the DIY workshops action (%women).

Resources analysis

In most of the cases, DIY workshops required the same resources as any other workshop: venue, print materials, IT devices (e.g. computer and projector), etcetera. However, particularly for EmpowerMed purposes, some specific items were acquired or developed to be used by some pilots. In particular, the following items stand out: the efficient light bulbs distributed by Slovenia during the DIY workshops, the PV solar panel acquired by Croatia for the DIY Solar panel workshop, and the automatic evaluation tool used in Barcelona to optimize consumers’ electrical bill. Nonetheless, the potential use of these items in other locations will depend on the workshop’s goal and design and it is considered not relevant to discuss them in this project as its utilization will be set on a case-to-case basis. A similar observation is done regarding time and human resources needed.

### 3.4 Support to financial schemes

Only data from Italy, Slovenia and Spain is currently available regarding this action. In Albania, no data is expected as the Support to financial schemes workshops are not planned to be implemented due to the lack of support mechanisms for families under financial vulnerability in this country. In Italy and Slovenia, Support to financial schemes workshops are implemented following a similar structure to the other workshops implemented in each pilot. In Barcelona, this are implemented within the Collective assemblies' context, involving accompanying financially vulnerable people throughout the bureaucratic process to obtained financial aids, which resulted in cost savings not seen in other pilots where the workshops were mostly informative.

#### Results achieved

The number of participants in the three pilots that reported data for this action was 7 in France (Marseille), 14 in Italy (Padova), 16 in Slovenia (Obala), and 60 in Spain (Barcelona). The share of women participants was 86%, 50%, 63%, and 67%, respectively. This means that Barcelona was the pilot with the largest number of participants but Marseille was the region with the largest share of female participation (proportional). Italy was the pilot with the lowest proportion of women participants. As happened with other actions, the setting in which Support to financial schemes was conducted in Italy might have influenced these numbers, as it included participants that are not in situation of financial vulnerability, which was not the case in Slovenia and Spain.

#### Resources analysis

As Barcelona is the only pilot for which efficiency indicators are calculated for this action, no further analysis is presented. More details can be consulted in Section 2.6 where the results for the Spanish pilot are discussed.

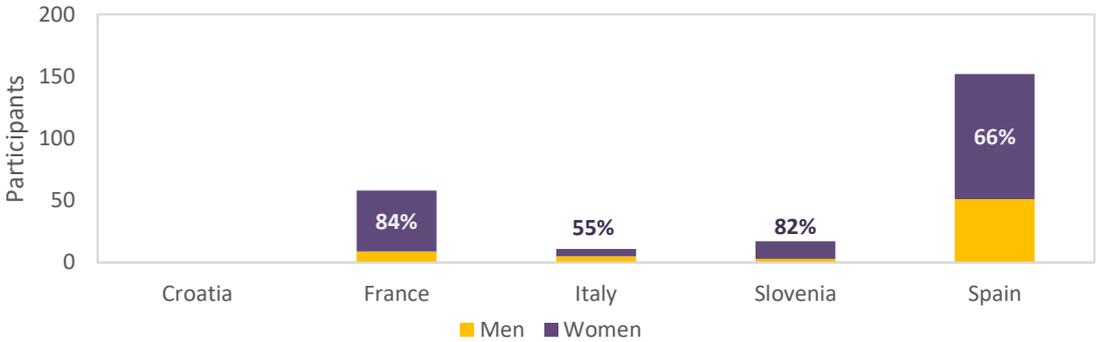
### 3.5 Health Workshops

The approaches followed by the partners in these particular actions were the most differentiated. In Slovenia, these workshops were not addressed to affected people but to actors dealing with people in financially vulnerable contexts (nurses). France and Italy implemented educational health workshops, raising awareness about the link between energy poverty and health to affected people and the general public. Finally, in Barcelona, health support groups were set up following a similar approach to the Collective assemblies setting, although support from a therapist was added due to the issues arising during these conversations. Indoor comfort metrics were also metered in participant households, offering advice to improve ventilation and usage of existing heating and cooling devices. Therefore, no unified process is presented for this action.

#### Results achieved

The impact of the Health workshops conducted in Croatia, France, Italy, Slovenia and Spain is difficult to quantify as no direct energy, cost or emissions savings are obtained from this

action. Thus, only participation levels can be assessed and compared across locations. As observed in Figure 24, the Spanish pilot register the highest attendance of all (152) but France registered the highest share of female participants (84%). However, it is observable that women participation in Health workshops is the strongest among EmpowerMed context, when the overall share of female participants per activity is considered (71%). No data from Croatia is available at this moment.



**Figure 24. Number of participants per gender in the Health workshops (%women).**

In Barcelona pilot site quantitative data also shows a much higher participation of women (66% in health workshops – mutual support). Qualitative data shows that participants to the health workshops have felt a save space where to share their personal health impacts (mental and emotional, not only physical) achieving better mood, amplified support network, resources and resilience strategies. The space has offered sincerity, endurance and confidence among assistants.

**Resources analysis**

As no direct savings are quantified for this action, no further discussion regarding the relation between resources and benefits is presented. Furthermore, the different approaches followed complicate the comparison of the resources usage among pilots.

**4 DISCUSSION**

According to partners’ opinions<sup>3</sup>, Household visits, Health workshops and DIY – Low cost measures fulfilled the initial expectations of all pilots in which these were implemented. Community approaches, DIY – smart meters and Support to Financial Schemes received mixed opinions depending on the pilot. Surprisingly, 70% of participants mentioned that if the project would start over again, they would implement not only the actions fulfilling original expectations (Household visits, DIY- Low cost measures, and Health workshops) but also Community approaches and DIY – Support to financial schemes. On the contrary, DIY – smart meters and DIY – solar panels, as planned for this first iteration, would not be repeated in a new EmpowerMed version.

<sup>3</sup> A survey about partners’ experiences during the implementation of EmpowerMed’s actions across the different pilots was carried out before the project’s General Assembly in Zadar, Croatia during May 2022.

When asked which of the implemented activities are expected to have a greater impact on reducing energy poverty, 50% of partners pointed out Household visits, 40% Community approaches, and 10% DIY – Low cost measures. Health workshops are considered neutral as they were not mentioned as the most or least contributing activity by any partner. On the contrary, the activities that were expected to contribute the least were Community approaches according to 30% of partners, Support to financial schemes (20%), DIY – Low cost measures (20%), DIY Smart meters (20%) and DIY – Solar Panel (10%). The contradictory results obtained for Community approaches coincide with the mixed experiences that pilots had with this particular activity.

Community approaches worked particularly well for Barcelona pilot where they were an already ongoing activity that was strengthened but not originated through EmpowerMed, as happened in the rest of pilots. This is evidenced by the high number of participants reported in this pilot's KPIs, which are significantly higher than for other partners. Moreover, direct actions resulting from the assemblies were already identified and promoted – optimizing bills, accessing social aids, claiming rights as vulnerable consumer – in this pilot, which translated into tangible cost savings for participants.

For the rest of the pilots, the use of Community approaches (Albania, Croatia, France, Italy, Slovenia) was challenging as they had to start organizing the events from scratch. As reported by the partners in the resources mapping activity, most of the efforts for this action went to gather participants. This process was supported by local organizations – as it is done in Barcelona – that contributed to contacting potential beneficiaries. However, in the Croatia, France and Slovenia pilots, communication channels were narrowed, and the participation rate was low. In the case of Italy, the local partner had a wide network, which allowed it to reach hundreds of people and increment the attendance per session to similar levels to Barcelona. However, only two sessions were implemented in this case as there were no conditions to make it an ongoing activity. Part of the barriers was that the Italian partner was unknown in the area before it became active in it through EmpowerMed.

DIY – Low cost measures are one of the actions that fulfilled original expectations, but was classified in the group of actions to contribute the least to reducing energy poverty, which makes sense if the expectations for this activity were modest since the beginning. The main complaint among partners is that this action is mostly informative and does not result in direct energy, cost and emissions savings that could be assured and monitored, although it is possible that the information provided could lead to some behavioural changes or investments that contributed positively to these aspects.

Despite the issues explained above, most partners would implement this action again in a new version of the EmpowerMed project. However, when further details were discussed, some partners mentioned the possibility to integrate them into Community approaches as there are synergies between both actions and it could contribute to make them more successful in terms of participation and impact. Indeed, some pilots already merged some of the activities during this first iteration, obtaining favourable results.

A similar view is held on the rest of DIY workshops, for which partners think would benefit from being integrated with Community approaches. Nonetheless, DIY Smart meters and DIY PV panels workshops would have to be additionally redesigned. In the first case, partners from Barcelona mentioned that the activity, as initially planned, was negatively impacted by regulatory changes taking place during the project duration. Although pilot leaders still see potential to use smart-meter data to help households reduce energy

expenses, the developed tool would have to be redesigned for different applications. Other partners mentioned that they would not repeat this activity as smart-meter data is not as accessible as in the case of Barcelona, which complicates taking advantage of it.

In the case of DIY panels workshop, only the experience of Croatia can be discussed. The approach taken by this pilot consisted in a more practical workshop where people could learn about the technology and available schemes while installing an actual system in a financially vulnerable household. The workshop's reviews are positive, but it is difficult to ensure this action will translate into renewable energy investments, particularly in homes that are in a financially vulnerable context.

Health workshops were also identified as some of EmpowerMed's activities that better fulfilled partners' expectations. In most cases, pilots provided informative sessions to raise awareness about the link between energy poverty and health. Among the different initiatives, the approaches used in Barcelona (Spain) and Obala (Slovenia) stand out. The first one due to the implementation of specialized sessions led by a therapist in which affected people could share their feelings and experienced in a safe space, finding support from other peers dealing with similar issues. In Slovenia, it is interesting that the focus of Health workshops was not affected households but health practitioners, which in turn, might benefit a larger number of people dealing with financial vulnerability by informing professionals about the impact on energy poverty on people's health, which might result in better care for people in this situation.

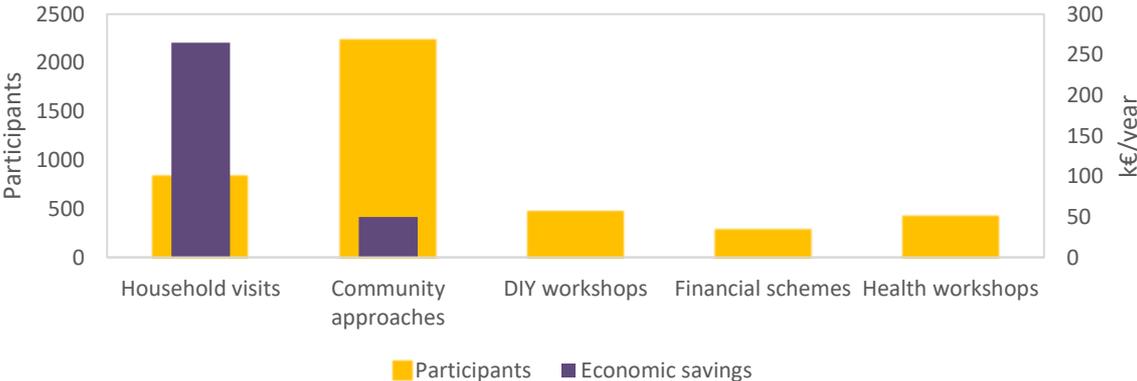
From the actions obtaining unanimous positive reviews (Household visits, Health workshops and DIY – Low cost measures), several partners mentioned that Household visits led to the most tangible, direct and fast impact on energy, costs and emissions savings. The implementation of low-cost devices and communication of energy saving tips resulted in relevant benefits for the participant households as seen in the project KPIs presented in previous sections. Still, when looking at the numbers, it stands out that some pilots were more successful than others in terms of participation and energy, cost and emissions savings achieved. The first aspect is strongly related to the partners' experience in the area. For instance, Croatia's team – visiting 200 households – was already involved in energy poverty actions within Zadar, whereas in France, the partner was a new player, which impacted on the number of households (39) accepting to participate in the initiative. Moreover, Household visits were rated by the partners as one of the activities requiring more resources (time, work, money), which is also evident by the efficiency KPIs obtained for this activity.

Finally, Support for financial schemes was implemented in three out of the six pilots. In Albania this action is no longer considered viable as no financial schemes suitable to the needs of financially vulnerable households were identified during the project. Italy and Slovenia followed an informative approach, similar to DIY and health workshops. In Spain (Barcelona), Support to financial schemes were conducted in parallel to the Collective assemblies, developing specialized sessions about social aids to help household covering energy expenses. Moreover, it included accompanying people in the process to obtain the available discounts over energy bills, which resulted in the economic savings reported in this document. This, however, was possible thanks to the work and tools already implemented as part of the Community approaches.

### 4.1 Energy and cost savings

Energy savings were reached mostly through Household visits, as it was the only action whose main purpose was to implement energy savings measures directly in affected people’s homes. These energy savings reported included both heat and electricity. Moreover, water savings were also pursued through this activity in most of the pilots. The achieved heat, electricity and water savings translated into emissions and cost savings. Most of the economic savings achieved as part of EmpowerMed’s actions are due to collective assemblies in Barcelona, where political action led to protection measures towards vulnerable consumers, which help freeing people from debt. Furthermore, the Spanish regulatory framework contemplates some figures that households in situation of financial vulnerability can use to reduce their energy expenses by applying government-funded discounts over their electrical bills. Unfortunately, similar regulations are not in place in all pilots, which imposes barriers on this particular mechanism that is already challenging to implement as a recurrent approach, due to differences in cultural and social context (for instance, in some countries people are less willing to share their problems in public). However, the Spanish experience shows that the efforts might be worth it in the long run, once the assemblies are ingrained in the community.

Comparing the results obtained by the different actions in terms of economic savings and number of participants (Figure 25) in all of EmpowerMed’s pilots, it is observed that Collective assemblies reached almost three times more affected people than Household visits, the second action with the highest reach among EmpowerMed’s strategy. However, household visits result in the highest overall economic savings. This means that Household visits are the most effective when comparing the cost savings achieved per participants. Specifically, for all of EmpowerMed’s pilots, Household visits resulted in economic savings of 410 €/hh whereas Community approaches led to 25 €/hh. That is, Household visits reported seventeen times higher savings than Community approaches.



**Figure 25. Number of participants (yellow) and economic savings (purple) reported by each activity in all EmpowerMed’s pilots**

However, when contrasting these results against the number of hours dedicated to each activity (average per all pilots), Community approaches (53 €/h) save twice as money per hour invested per household than Household visits (27 €/h). Community approaches are also favoured when considering the number of participants reached per hour of dedicated work, as this action reached in average 1.9 hh/h versus the 0.1 hh/h reached by Household





visits. From future initiatives, these values might indicate that Household visits are the most effective action if cost savings are prioritized, but Community approaches might make more sense if reaching and empower a larger number of households is the ultimate goal.

## 4.2 Stress on women and health

Women's participation was high in most pilots and actions. In general, a trend towards higher women participation was observed in activities addressed to people in situation of financial vulnerability or groups with traditional higher female representation (e.g. nurses). On the contrary, women participation levels were lower where less financially vulnerable groups were addressed (university students, government representatives), or the covered topic was from fields perceived as traditionally manly, such as STEM areas.

In Community approaches and Household visits women participation was above 49% in all pilots where these activities were implemented. Reaching over 70% in the case of the Community approaches implemented in Padova (Italy), and the Household visits in Croatia and Slovenia. It must be noted that both actions targeted solely groups under financially vulnerable contexts. On the contrary, the different workshops implemented (DIY, Support to financial schemes and Health) showed different female participation levels depending on the participant characteristics.

Regarding women empowerment, the collected data shows that even when women are actively looking to take an active role in energy decision-making, for instance by participating at EmpowerMed's activities, their power to make decisions about energy services at home is limited, or at least, lower than for men participants. This is evidenced by the fact that in all cases women in charge of paying the bills or being the contract-holder at home is lower than the share of female participants in the activity. The differences between men and women dynamics were more prevalent in some pilots (e.g. Croatia) than others. It must be noted, that the pilot in Barcelona seems to be an exception to this trend, as a higher percentage of women than men is registered as the contract holder for their energy bills. Furthermore, women are active participants in the Collective assemblies in Barcelona, as they not only attend in higher numbers than men, but they speak up more often.

Health indicators show that EmpowerMed's actions impacted a relevant number of people whose health condition is self-perceived as poor or very poor. As women participation in these activities is high, it is fair to assume that a fair share of these people are females. In general, the number of people suffering from long standing health issues or illnesses is lower than those with poor or very poor health, but still represents an important share of total EmpowerMed's participants.

Importantly, it was observed that in the Italian pilot, a higher share of respondents – in comparison to other locations – chose not to disclose this information. This might be an indication of a cultural context that prevents people from sharing health information publicly, even when anonymity is assured. Such secrecy is a barrier to collect data to study the link between energy poverty and health.

## 4.3 Covid-19 impact

EmpowerMed's actions were planned before the Covid-19 pandemic happened. As many of



the actions depended on human interaction and group activities, the impact of the restrictions imposed on the different pilots to control the disease spread took a toll on the expected impacts. In particular, pilot leaders mentioned that Community approaches were the most affected by the situation, followed by Household visits and Health workshops. The rest of the activities were less impacted as in many cases they were fully transferable to a virtual format.

In Barcelona, where ongoing collective assemblies were already established by the time of the pandemic, moving to a virtual format was challenging but doable. Notably, this new format led to a hybrid approach, and now in-house and remote attendees are connected to the assembly, which permits people from outside Barcelona to join. However, for the rest of the pilots where Community approaches were in its infancy, the inability to hold events with numerous people in a closed venue delayed their implementation and affected attendance rates.

In the case of Household visits, Covid-19 also impacted negatively on the number of participants willing to let people enter their homes to implement energy saving measures, especially as even under normal circumstances, people are reluctant to let strangers in. Moreover, the pandemic effects on society – for instance, soaring unemployment rates – shift the focus from energy supply to the provision of even more fundamental needs such as food or water. This situation dispersed the attention of local partners that were already working with the communities and were pivotal to allow EmpowerMed’s staff to access potential beneficiaries.

The participation in Health workshops was also affected by the sanitary emergency, especially as these were mostly addressed to people in situation of financial vulnerability that were at more risk to suffer complications from Covid-19, or to health practitioners that had full agendas due to the unusual demand from sanitary services. DIY workshops and Support to financial schemes were less affected, but not completely innocuous to the effects of the pandemic as in general terms, people were worried by issues other than energy, and more reluctant to join activities that imply contact with other people.

## 5 LESSONS LEARNED

In addition to the information presented in the previous sections, a guided discussion among EmpowerMed’s partners led to the identifications of a series of events or situations that resulted in unexpected successes or challenges for EmpowerMed’s implementation in the different pilots. The most relevant are presented in this section as they can be interpreted as lessons learned to be considered in future projects looking to mitigate energy poverty through similar approaches.

Regarding Collective assemblies’ implementation, it was observed that starting the program with an informative session helps to situate attendees and break the ice, preparing the group for later discussions. This is particularly recommended during the first sessions as ensuring that Collective assemblies are informative and useful from the start is critical to ensure its long-term success and a significant reach as affected people that has had a good experience in the assemblies tend to bring peers that are facing similar situations to upcoming sessions. Moreover, incorporating Collective assemblies into well-established structures decreases failure risks in comparison to implementing them from a



scratch. For instance, they can be offered in ongoing programs addressed to families affected by other poverty aspects, or through community-led programs that already have an established base of attendees.

The surveys used to collect data on energy poverty are considered a useful tool by all partners. Nonetheless, a few shortcomings were identified during its implementation in the different pilots. For instance, in some cases, completing the survey took almost an entire hour as the questions prompted conversations with affected people that led to longer times. Due to the nature of the topics discussed, it was not always possible to redirect the conversation as the interviewer considered sensible to listen to the people affected by energy poverty. An hour-long interview, however, was tiring for people affected by energy poverty who were not as receptive during the last questions of the survey.

Another issue was that some questions were perceived as too personal for some of the people. Although participants were given the option to not answer if they felt uncomfortable with the information requested, some questions may be rephrased to get the information needed without the personal details, or its inclusion in the survey might be reevaluated considering the user's perceptions and the information's value. Therefore, it is suggested to test the questionnaires with a group of volunteers to get a better grasp of its application in a real setting and adjust before applying it to the entire population.

During household visits, the survey implementation also faced some challenges to ensure women's experiences were accounted for as the interview was usually conducted with all the family present – including men and women – and men tended to respond the vast majority of questions. With this in mind, it is suggested to design questions that are specifically addressed to each gender, and ask each party directly depending on the case. For Household visits, experienced and well-trained operators result in more significant outcomes as they are more equipped to identify problems that contribute to energy poverty and suggest potential solutions. As part of EmpowerMed, Household visits were planned as a one-time event, which meant that families were visited only during one season. This increases the risk of having unidentified problems, whose nature vary depending if the household was visited in summer or winter. In this sense, it is recommended to schedule two visits, covering hot and cold seasons, to ensure all relevant issues are detected.

Accessing households' consumption data from the distributor's website has advantages as it permits to analyse it and provide personalized recommendations without installing any device. However, it also poses some challenges as during the implementation of the DIY-Smart meters' action in Barcelona's pilot, an affected household that registered into the distributor's website started receiving payments notifications to their email, which was unknown before by their energy company. This raises concerns as, even though electricity distribution must be a separated activity from commercialization, there seems to be a risk for energy companies to get access to users' data through this registration process.

Furthermore, using the distributors' website to download the households' consumption data imposes additional challenges to using an automatic analysis tool as that designed for the EmpowerMed project given that data format is changed constantly at the source. During the monitoring campaign, at least four adjustments were done to the original code to incorporate the latest changes done by the distributor's API service. For the project implementation, this translates into requiring a person with programming experience to be available during the entire monitoring campaign to conduct these updates.

DIY workshops were particularly successful among young people, so reaching to networks

and associations targeting this particular demography might be an efficient approach to ensure a wide reach for upcoming initiatives using this type of actions. In some pilots, DIY workshops were better welcomed than Collective assemblies as they do not require the same engagement level, as attendees' participation is more passive than active. In this way, it might be useful to combine both approaches, and use DIY workshops to engage people and build a trusting environment, and later implement the Collective assemblies' dynamic where a more active participation is required.

Rigid financial schemes are not always useful to energy poverty-affected households as their characteristics do not always match their needs. Moreover, some households require an additional series of guarantees – for instance, disconnections ban or guaranteed minimum energy consumption – as a stepping stone to get families out of energy poverty, particularly those that do not currently have a steady income. This might be one of the reasons behind the low interest that affected households showed in receiving support from EmpowerMed to access existing financial schemes available in the Slovenia pilot.

The energy poverty workshops addressed to health practitioners were particularly successful in the Slovenian pilot. In fact, attendees showed a great interest in scale the initiative to a national level as the areas covered by the EmpowerMed project are only a small fraction of the territory. For other audiences, it was observed that having a health practitioner (for instance, a doctor or nurse) together with the energy expert discussing the links between energy poverty and health issues contributes to cementing the message, as people show higher acceptance rates.

The intersection between health and energy poverty raises interest from a wide variety of platforms and collectives defending the rights of groups in financially vulnerable contexts. Therefore, health workshops are a great opportunity to build synergies with external networks for the implementation of other actions such as DIY workshops or Collective assemblies. Finally, it is recommended to dedicate part of the health workshops to discuss the higher risk that people with physical or mental issues have of falling into energy poverty. In most cases, the focus of the workshop was put into the effect that energy poverty has on people's health, but not the other way around.

## 6 CONCLUSIONS

The preliminary results from EmpowerMed's pilots add evidence about some of the hypothesis in which the project was built: energy poverty is a problem among Mediterranean households, and affects women harsher. This is evidenced by the largest share of women that participated in the actions carried out in the different pilots – Albania (Vlore), Croatia (Zadar), France (Marseille), Italy (Padova), Slovenia (Obala) and Spain (Barcelona) – and which were particularly higher when only financially vulnerable people or traditionally female professions were addressed. This is a trend that was observed across all pilots, although the gender imbalance is larger in some countries than others, which might reflect the local gender dynamics.

Five different actions were implemented as part of the EmpowerMed project, in particular, Community approaches, Household visits, DIY workshops (PV panels, Smart meters, Low-cost measures), Support to financial schemes workshops and Health workshops. From these, Community approaches, Support to financial schemes and Low-cost measures (DIY

workshops) were implemented in all pilots. The rest were used in some regions but not in others.

While comparing the results obtained per pilot and per action, it is clear that different actions produce different impacts in terms of energy, cost and emission savings. This was an expected outcome as observed in the correlation matrix shown in Table 3. Community approaches were expected to impact mostly on Economic savings, women participation and empowerment. This action's outcomes corroborated this hypothesis at least in the case of Barcelona (Spain), where significantly higher economic savings were achieved not only when compared to the other actions implemented in this pilot, but to all other actions carried out in EmpowerMed's regions.

In the other pilots following this approach, however, Community approaches' impact on this indicator was lower than expected. The explanation is that the other pilots (Albania, Croatia, France, Italy, Slovenia) spent a significant amount of time building relations with local stakeholders and reaching potential attendees. Moreover, some of the local conditions – lack of policies to protect vulnerable consumers or market conditions without room for contract optimization – make more complicated to translate Collective assemblies into practical action and tangible savings. In many cases, more time might be needed to construct a similar infrastructure to the Barcelona pilot, and mobilize political action to get regulations and policies in place that permit vulnerable consumers accessing financial and administrative schemes that protect their rightful access to basic energy services. This is the main reason while Community approaches received mixed valuations from EmpowerMed's partners. Women's participation was visibly high for this action in all pilots, as the lower share was reported in Marseille (54%), and even in this pilot women represented more than half of participants.

Household visits were expected to have a higher impact on energy and emissions savings, which was corroborated by field data as this action resulted in the highest energy and emissions savings in all pilots where it was implemented (in other words, all except Barcelona). The action was also expected to have higher impact in terms of women participation, which was also observed as the lowest share of women participants was 49% in the Albanian pilot. Despite the positive results obtained by this action in all cases, its potential to be implemented in other regions is not clear when considered the resources invested to carry out this activity. In general, household visits are resource consuming in terms of money, time and effort. However, in countries in which high potential savings are expected, Household visits might still make sense, even if paid workers and not volunteering energy advisers are contracted for its implementation, as regions with high potential savings tend to have low average hourly wages.

DIY workshops were expected to have higher impact in terms of energy, emissions and cost reductions, depending on the specific type implemented. Furthermore, DIY solar panels were expected to lead to higher investments in renewables. Nonetheless, the workshops actually implemented in the pilots followed a more educational approach, which made difficult measuring its impact on the defined indicators. The only exceptions are the workshops carried out in Slovenia where efficient lightbulbs are distributed as easy-to-implement energy saving measure leading to energy and other associated savings; and the DIY Smart-meters in Barcelona, which resulted in economic savings thanks to the bill optimization tips provided to people in situation of financial vulnerability. Nonetheless, the achieved savings are much lower than those achieved through Community approaches and

Households visits.

Support to financial schemes was not expected to have a high impact on any indicator except for investment on renewables. However, in practice, they contributed to economic savings achieved in the case of Barcelona (Spain). For the rest of the pilots where this action was introduced (Italy, Slovenia), the impacts achieved were difficult to track as they consisted on informative sessions. In the case of Albania, this measure is no longer considered due to the lack of suitable existing financial schemes. Despite its low impact, it is noticeable that most of the pilot leaders will implement them again if the project would start over. This might be explained by the need of financing to implement actions with high impact on households in financially vulnerable contexts, such as building refurbishing or renewable energies installation. However, this action only makes sense when existing financial schemes are put in place in the target region.

Even when financial support schemes exist, EmpowerMed's experience show that some other challenges might prevent households dealing with financial vulnerability from accessing them. For instance, complex administrative process or mistrust on financial institutions or public agencies providing this service that discourages affected households to pursue these processes even when support from initiatives such as EmpowerMed is available. Another barrier is that a large portion of households affected by energy poverty do not have a steady income, which leave these households out of financing programs or make them more reluctant to get into debt even if they are eligible to get financing with conditions tailored to financially vulnerable groups.

Finally, Health workshops were not expected to contribute to the main indicators due to their nature. Still, EmpowerMed's experience shows that these might add value from unexpected points of view. For instance, raising awareness among health practitioners that have direct contact with population dealing with financially vulnerable conditions, providing a safe space to discuss the emotional effects of energy poverty among peers (positively impacting on affected people's mental health), or gathering data about thermal comfort that might provide insights to policy-makers about the need to refurbish Mediterranean buildings taking care not only of cold temperatures in the winter, but also hot temperatures during summer, a problem that might be exacerbated due to climate change effects, which poses extra burdens over households in situation of financial vulnerability.

## 6.1 Recommendations to the EU level decision makers

Based on the observed data and the partners' experiences throughout this period, the following recommendations are made for further actions against energy poverty in the Mediterranean or regions/cities with a similar context:

**R1. Household visits achieve significant energy and cost savings, but are investment and labour intensive.** The household visits conducted in five out of the six of EmpowerMed's pilots showed the potential of this action to achieve energy savings, which in turn translate into cost savings and emissions reductions. However, when considering the amount of resources – money, people, time – involved in their implementation, concerns arise about its replication potential. In the case of EmpowerMed the visits were conducted through volunteering work coordinated by the pilot leaders or by EmpowerMed staff itself, whose salary is not considered in the numbers presented in this

document. When this cost is accounted in the calculations, the net economic savings is reduced considerably, in some cases, resulting in higher expenses than savings, for instance, in countries like Italy where labour costs are expensive. Their effectiveness, nonetheless, seems promising for countries in which labour cost is more affordable and the current state of households permits to reach higher energy savings as is the case of Croatia and Albania. Furthermore, the number of hours and people required could be reduced if a network of stakeholders with experience in the target area is involved since the beginning.

**R2. Community approaches take longer to build, but their impact might be high in terms of cost savings.** Pilots in which Community approaches were implemented from a start faced issues to engage potential participants and kick-off collective assemblies. Furthermore, once running, it was difficult to keep recurrent sessions with revisiting participants. These initial difficulties translated into lower energy, cost and emissions savings when compared to Household visits. Nonetheless, in Barcelona, where Community approaches were already known, the achieved cost savings were significantly higher than in other pilots. This indicates that Community approaches might still be worth pursuing, even if they require more time in their initial stages. However, it must be considered that this time might be extended in countries where there is no current system to protect financially vulnerable households against energy poverty, as Community approaches rely on this to achieve tangible savings. In regions where this is the case, Community approaches might still make sense as a tool to eradicate energy poverty, as other important function of this approach is to mobilize political action towards the implementation of regulations and policies protecting families in situation of financial vulnerability. This, however, might take years to materialize depending on the regional context.

**R3. Political action is required to eradicate energy poverty.** In any case, it is observed that without political action to promote regulations and policies addressed to families in financially vulnerable contexts, energy poverty eradication gets even more complicated. For instance, Support to financial schemes has been ruled out of the Albanian pilot as there are no financial schemes currently in place that are suitable to the needs of families under financially vulnerable contexts. Other example is Slovenia, where it is hardly useful to implement actions to optimize the households' electrical bills by changing tariffs or company because all suppliers offer similar prices and tariffs. Although political action might come from different places, Community approaches are expected to have a larger impact in this area than other actions, as they unify people affected and concerned by the same topic.

**R4. Workshops might be more efficient when combined with impactful actions.** Most of the actions implemented during EmpowerMed corresponded to workshops addressing different aspects: Support to financial schemes, Health workshops, and DIY workshops (PV panels, Low-cost measures and Smart-meters). Some of them followed a hands-on approach, but the large majority consisted on sessions to raise awareness about energy poverty, its impacts and potential mitigation actions. Although most of them might indeed result in energy, cost and emission savings, its impact is difficult to quantify without participants' follow up, which might be expensive. Moreover, EmpowerMed's experience show that these workshops are more fruitful when designed as complements for other



actions with more tangible impacts such as Household visits and Community approaches. Furthermore, their joint implementation reduces the time and effort needed to engage participants, which was one of the major difficulties faced by pilot leaders.

**R5. Workshops with added value or innovative features might result in more lasting impact.** Some of the implemented workshops introduced an innovative feature that might justify their implementation as stand-alone activities outside Household visits and Community approaches. This is, for instance, the case of the Health workshops conducted in Slovenia, addressed to health practitioners, who are in contact with people belonging to this group, and having knowledge about the problem might improve the care received by people in this situation. This is particularly important considering the number of people that participated in EmpowerMed, who reported to have fair, poor or very poor health condition, or are suffering from a longstanding illness. Other interesting example are the practical PV solar workshops implemented in the Croatian pilot, in which participants could learn about the technology in the context of energy poverty by installing an actual system in an affected household. Finally, the health workshops in Barcelona also stand out by providing a safe space for people in situation of financial vulnerability to discuss their feelings and experiences around energy poverty and associated problems.

**R6. Consider other indicators beyond energy, cost, and emissions savings.** As exemplified by EmpowerMed, different actions might have different impacts in terms of energy, cost and emissions savings. For instance, Household visits are more effective in terms of energy and emissions savings, while Community approaches – when successfully implemented – lead to higher economic savings. Nonetheless, there are some other actions whose impact goes beyond the typical indicators. A good example is the Health workshops that took place in the Barcelona pilot. Its purpose was not to achieve tangible impacts in terms of avoided energy consumption, and its associated costs and emission. Their purpose was solely to serve as a safe space in which affected people could unload part of the emotional burden caused by energy poverty and its associated issues. The impact of this action is, thus, difficult to quantify with traditional indicators for energy poverty programs, but that does not mean that their impact on affected population is negligible. In this sense, it is necessary to consider other indicators to account for the impact of this kind of actions that deal with intangible benefits such as mental health benefits.

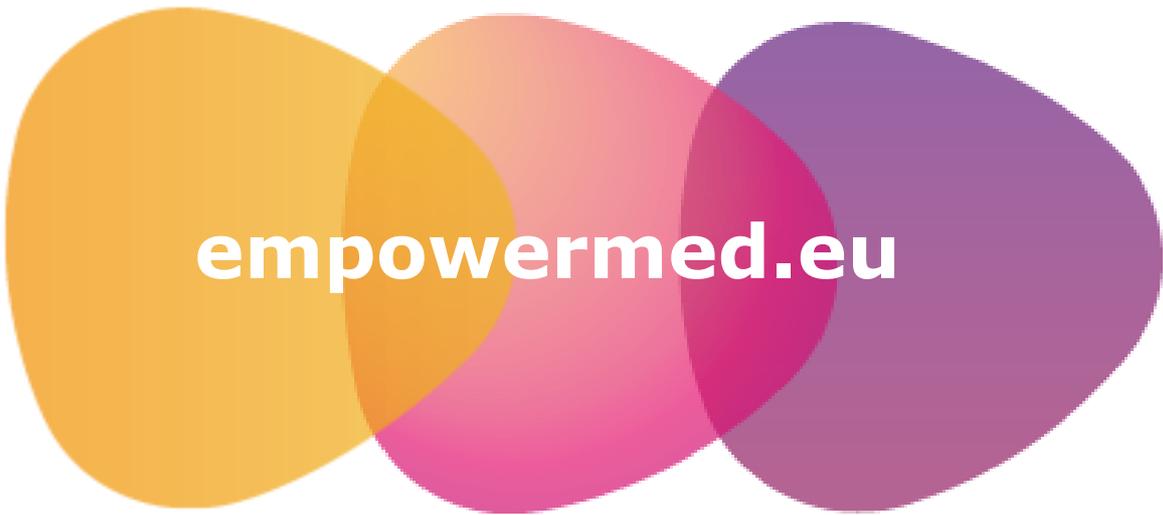
**R7. When dealing with groups in financially vulnerable contexts, women empowerment should be always kept on mind.** Women were active participants in EmpowerMed's pilots. Women tend to be overrepresented in actions addressed solely to groups dealing with financial vulnerabilities, but underrepresented in those in which more privileged demographics were targeted (university students, assistant to cultural festivals). Additionally, further indicators show that women tend to have less decision power than men at home regarding energy supplies, although the gap is wider or narrower depending on the context. Thus, it is important that program addressed to eradicate energy poverty take this gender imbalance into account to ensure women are as positively impacted as men by the implemented actions.



## 7 References

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