Monitoring programme for OSS practical operation

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Table of Contents

List of Acronyms

BMF – Business Model Framework

CEC – Citizen Energy Community

EE – Energy Efficiency

EPC – Energy Performance Contracting

ESCO – Energy Service Company

GA – Grant Agreement

HEUGO - Home Energy UpGrade Office

IC – Implementation Champions

KPIs – Key Performance Indicators

LEC – Local Energy Community

MFB - Multifamily buildings

OSS – One-Stop-Shop

PV – Photovoltaics

RE – Renewable Energies

REC – Renewable Energy Communities

RES – Renewable Energy Sources

SEC – Sustainable Energy Communities

SFB - Single Family Buildings

SME – Small and Medium Enterprise

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More information on the project can be found at https://www.h2020-upstairs.eu/

Executive summary

The document has been prepared to present the common concept of monitoring and the concrete tools used by every pilot partner to collect data on the agreed parameters, including explanations on benchmarks and assumptions used. The document is structured in two main types of chapters:

- Chapters that are common to all pilots presenting the background and objectives, the common methodology for monitoring, and the summarised results as of 30 November 2023 (the end of UP-STAIRS project). These chapters define unified parameters to be monitored and thus allow for characterization of results and drawing conclusions about the OSSs operation. Also a special chapter is included for comparison between the promised KPIs and actually achieved summarized results from pilots' operation.
- Chapters outlining the specific pilot's context that reflect the peculiarities of the situation in each pilot region. These chapters give more detailed information on tools to monitor the agreed parameters, and provide an assumption to calculate the expected/actual results applied by each particular pilot OSS.

1. Background and Objectives

The monitoring programme was developed and implemented to collect information and draw conclusions about the practical implementation of the OSS models for collective action, by setting the qualitative and quantitative parameters to be monitored, target stakeholders to be addressed, specific tools to be used and time-schedule for monitoring. The collected results are used to define the progress of pilot OSS operation and to measure the performance towards the promised KPIs. The main objectives of the monitoring are as follows:

- to collect information about the practical implementation of the five pilot OSS models for collective action carried out as part of the UP-STAIRS project programme;
- to measure UP-STAIRS activities against the promised impact indicators (KPIs);
- to draw conclusions about factors of success or failures during pilot testing of OSS business model frameworks;
- to contribute to the elaboration of guidelines on best practices and barriers during the implementation.

2. Methodology

The methodology for monitoring of UP-STAIRS results consists of the following main elements:

- Parameters to be monitored. These are quantitative (e.g. number of ICs trained, number of people involved/recruited, expected primary energy savings, expected investment) and qualitative (e.g. increase of skills/capabilities/competencies among local authorities' personnel and citizens, or specific factors for success and barriers for implementation and ways to overcome them);
- Target stakeholders to be addressed. Depending on the pilot context these can be ICs, citizens, local businesses, SMEs, local authorities and municipalities, representatives of local energy communities;
- Specific tools to be used. This encompasses the data provided by GCN from the UP-STAIRS platform (number of visitors, number of registrants, data taken from clients upon registration per pilot region), info-sheets/tables for data collection during physical visits of premises of OSS, by phone calls or by e-mail;
- Details on pilot-specific methodology for calculating the results (e.g. national methodology under EED, energy audit reports, previous experience, reference studies on PV energy yield, etc.);
- Time-schedule for monitoring. It has been agreed that each partner will report after the launch of OSS once in a three-month period starting from end of September 2022.

The following assumptions regarding monitoring have been made:

- The figures reported refer both to already implemented and also to advised/recommended/foreseen solutions or measures as it has not been feasible to implement all measures and their results during the OSS monitoring phase (18 months);

- Not all parameters are covered with each reporting cycle, only the parameters with already accomplished results that can be proven by the selected methodology (see Impact Monitoring Table).

The table below shows a monitoring template that was provided to all of the pilots which includes a number of **predefined monitoring parameters** which have been agreed among the partners and outlined in the grant agreement. They monitoring template was populated by the appropriate pilot partners at the end of each reporting cycle:

Table 1: Monitoring template by the OSS in each pilot region

Parameter	**Unit**	**Value**	**Tools to collect data** (eg. online/offline questionnaire, visitor sheet, record in OSS reporting)	**Methodology of proof** of reported figures (eg. National methodology under EED, energy audit reports, previous experience, energy audit reports, reference studies on PV energy yield, etc.)
People outreached	Number			
People involved/recruited	Number			
Energy (to be) saved *(incl. from behavioral changes)*	kWh/annum			
PV energy (to be) produced	kWh/annum			
Building area (to be) refurbished (only for pilots doing EE in buildings)	m^2			
PV energy (to be) installed	kW			
Associated investments	Euro			
Energy communities (to be) established or inspired	Number			

The above methodology was developed and disseminated as part of the IC training sessions held in the different pilot regions. As one of the main goals of UP-STAIRS project is to stimulate the creation of energy communities, additional information was collected about the number of energy communities whose creation was facilitated and supported by the OSS in the five pilot regions.

Division of responsibilities among partners

The main responsibilities of partners in monitoring process are divided as follows:

- Partner SEC as WP3 leader in collaboration with coordinator IERC elaborate the draft of methodology elements and present it to the pilot partners for comments and additions, and after receiving feedback prepare an updated version which is then used by the pilot partners as a template for result collection.
- Pilot partners participate in the elaboration of the template for results collection providing comments and suggestions according to their experience and specific situation;
- Pilot partners collect data according to the agreed template and submit it to SEC according to the pre-agreed schedule;
- SEC summarize the input received by pilot partners in a single document D3.3, and send back the summary for verification and comments by the pilots, and after receiving feedback provide the draft to Coordinator IERC for review and comments. Once all the questions are clarified and comments reflected, the document D3.3 is ready to be delivered.
- Due to the difference in specific local circumstances in the UP-STAIRS pilot regions and the different administrative features of the pilot partners, the pilot partners are responsible for definition of the specific tools and means of verification, and for providing the respective proofs of results.

Collection of qualitative information

In order to develop a deeper understanding of the establishment and work of the five pilot OSSs, three simple questions were prepared and answered by the five

UP-STAIRS pilot partners. Below are shown the questions for collecting qualitative data:

Question 1: What were the key findings/learnings in establishing and operating the OSS?

Question 2: Which target groups is the OSS interacting with successfully, which target groups less so?

Question 3: Which are the most important learnings in relation to the policy framework in your countries and what are your recommendations for improvements?

The answers to the above questions were collated together with other additional feedback in order to support the development of D3.4 “Guidelines for practical implementation of OSS business models for collective action”.

3. Summary of Final Results

The last round summary contains information and data about the results from the five OSSs activities in the pilot regions achieved by 30 November 2023 when UP-STAIRS project officially ended. The results are cumulative and are formed by aggregating the data from previous rounds of monitoring (30 September 2022, 31 December 2022, 31 March 2023, 30 June 2023, 30 November 2023), as follows:

- **People outreached:**

  70,655 people in total in the five pilot regions. These are people that have been informed about the OSS services and potential benefits mainly as a result of various promotional activities undertaken in the pilot regions.

- **People involved/recruited:**

  15,765 people in total in the five pilot regions. These are stakeholders that contacted and interacted with the ICs (physically and/or remotely) and received information about certain aspects of the available OSS services as well as advice on concrete topics they were interested in.

- **Energy savings (expected): 21.8 GWh/year**
- **PV energy (to be) produced: 110 GWh/annum**
- **Building area (to be) refurbished: 390 thousand sq.m.**
- **PV energy (to be) installed: 78.5 MW**
- **Associated expected investment: 134.7 MEuro**
- **Number of energy communities supported – 321**

4. Pilots' context

The pilot context is described according to the above presented methodology for monitoring. More detailed description on each of the pilot's context is given in the next sections.

4.1 City of Cork

The monitoring efforts in City of Cork have been directed towards ICs and the citizens interested in EE improvements and RE introduction in their homes. By the end of UP-STAIRS project (30 November 2023), the UP-STAIRS OSS in Cork has reached the following results:

- **People outreached**: **6905** people have been reached. This number has been counted by means of the electronic people counter installed at the door of the HEUGO.
- **People involved/engaged – 816** in total
- **Energy savings (expected)**: **8,643,735** kWhr/year.

  The figure was derived based on the following assumptions:

  - The area of each house due to the address recorded from each visitor at HEUGO.
  - Number of visitors that give us information recorded on spreadsheet at HEUGO.
  - Energy uplift based on average energy rating (210 kWhr/m^2/year) versus target energy rating (125 kWhr/m^2/year). Therefore, energy reduction required per property would be (210-125=85) 85 kWhr/m^2/year.

The methodology of calculation of the figures is as follows:

- The number of visitors to HEUGO, who give details, are recorded on spreadsheet (accessed only through CCiC server);
- Area of building found by Eircode or address using Google maps;
- Energy savings figures gained using Retrokit software;
- Calculation for energy (to be) saved:

  1. Number of visitors who gave details: 816
  2. Total area of properties to be upgraded: 101,691 m^2

3. Energy uplift figure: 85 kWhr/m^2/year

Therefore 101691x85 = 8,643,735 **kWh/year**

- **PV energy (to be) produced**: **920,400 kWh/year**
- **PV energy (to be) installed**: **1,416 kWp**

The calculations of PV energy expected to be installed and respectively produced are based on the following methodology: there were 354 visitors that expressed interest in installing Solar PV. The size of an average unit installed is 4kW Solar PV (source: SEAI) which result in 354 x 4kW = 1,416kW PV power installed. 4 kW power units will produce on average 2600 kWh/year, therefore 354 x 2600 = 920,400 kWh/year PV electricity generated.

- **Building area refurbished (expected)**: **101,691** m^2 based on the area of each house recorded from each visitor at HEUGO.
- **Associated investment: 3,315,000 Euro** estimate.
- The figure was derived from the following assumptions and figures:
  - 354 visitors expressed interest in Solar PV. Average system costing 8000 € to install.
  - 483 visitors expressed interest in attic insulation. Costing on average 1000 € (figures based on actual costs).

  Thus 354x8000= 2,832,000 Euro foreseen investment in Solar PV
  And 483x1000= 83,000 Euro foreseen investment in EE
  Total: 2,832,000+483,000= 3,315,000 Euro foreseen investment.
- **Number of energy communities supported -297**. The number is derived from the database of citizens who expressed interest in the formation of energy communities recorded within HEUGO.

4.2 Barcelona Metropolitan Area (AMB)

The monitoring efforts in Barcelona Metropolitan Area have been directed towards local municipalities who created their UP-STAIRS OSSs and citizens interested in RE - PV introduction in homes.

By the end of UP-STAIRS project (30 November 2023), AMB has achieved the following results:

- **People outreached: 1550 stakeholders**. The figure has been calculated on the basis of webpage visits and attendance in dissemination activities. As a result, 1100 citizens and 450 SMEs were outreached. AMB consist of many municipalities and the processes of establishing OSSs as well as staffing and training ICs have taken much longer than anticipated. By the end of the project, there are 9 operational OSSs and 90 ICs trained. AMB created an umbrella OSS ("La Teulada") staffed with 3 permanent employees to support the municipalities that already have established their own OSSs and to help the municipalities in the process of establishing OSSs.

The data on the rest of the parameters are as follows:

- **People involved/engaged** – **274**. The main tool for ICs to recruit clients and communicate with them is the web. AMB created a parallel website as a backup and the data is taken from there.
- **Energy savings**: n.a.
- **PV energy (to be) produced**: **93,204,243 kWh/y**. Based on the data for **PV energy installed** (see below) estimations are made according to the ratio kWh/kWp
- **Building area (to be) refurbished**: n.a.
- **PV energy (to be) installed**: **69,040 kWp** The tool for data collection and analysis is based on the data for PV installations on the territory of AMB on the web-site: https://icaen.gencat.cat/ca/energia/autoconsum/Observatori-de-lautoconsum-a-catalunya/evolucio-de-lautoconsum/

[1] The method of proof of results is through extraction of data registered in the Catalan official legalization site for PV.

- **Associated investment**: **103,560,270 Euro**. The associated investments are assessed according to the market prices of PV technology which currently stand at an estimate of 1.5€/Wp per kWp installed.
- **Number of energy communities supported – 2.** Currently there are 2 Energy Communities formed by Town Councils in the municipalities of El Prat de Llobregat and Sant Andreu de la Barca. Town Councils notified AMB Energy Department about these developments.

[1] The site Is used in the following way: one has to select and download the data. It's in Catalan and Spanish, but not in English and one has to select the 36 municipalities one by one. It was done by AMB staff in order to present the data needed for the Up-Stairs project. The raw data can be provided upon request

4.3 Upper Austria

The monitoring efforts in Upper Austria have been directed towards local municipalities, SMEs and citizens interested in PV introduction in homes. The following results have been achieved by the end of UP-STAIRS project (30 November 2023):

- **People outreached: 37,909 people**. The main tools to collect the data are: direct mailings by ESV (10,079), visitors to tradeshow stand (3,900), and newspaper articles (23,930).
- **People involved/recruited: 4,355 people**. The main tools to collect the data are:
    - List of participants in events: 3,234. Mostly municipalities, also private citizens and SMEs.
    - List of advised clients: 1,121 clients receiving specific advice about renewable energy communities and PV, mostly private citizens and municipalities.
- **Energy savings**: n.a.
- **PV energy produced**: **8,140,000 kWh/annum**. The calculation is based on 8,100 kW installed PV capacity (see below) and the assumption that 1 kW = 1,000 kWh/annum produced PV electricity.[2]
- **Building area refurbished**: n.a.
- **PV energy installed**: **8,140 kW**.

  The calculation is based on the following assumptions:

    - Regional PV statistics on average PV installation size in 2021 - 18.8 kW is the average installed capacity of new PV installations in 2021 in Upper Austria;

[2] Sources:
https://www.solarpowerworldonline.com/2017/08/specific-yield-overview/
Bulgaria, Rhodope Mountains Region, installation of PV on hospital roof, with PV yield of 1460 kWh/y per 1 kW PV installed.

- 1/3 of advised clients install PV - 1,121 x 0,33 = 336 PV installations;
- 3% of participants in events installed a PV system - 3,234 x 0.03 = 97 PV installations.

Total of 433 PV systems (336+97) installed multiplied by 18.8 kW (average installed capacity of new PV installations in 2021 in Upper Austria) = 8,140 kW of installed PV systems.

- **Associated investment**: **8,140,000 Euro**.
  The calculation is based on the assumption of 1000 Euro per 1 kW PV installed.[3]
- **Number of energy communities supported – n.a.**

[3] Sources:
Solar PV installation cost worldwide 2021 | Statista
Average Solar Panel Cost Per kWh in 2023 | Solar.com
In Bulgaria, in Rhodope Region hospital, the overall costs of the system stand at almost 1500 Euro/W installed for year 2015.
2022 information from PV installers in Bulgaria give 1000 Euro per kW installed PV.

4.4 Municipality of Asenovgrad

The monitoring efforts in Asenovgrad have been directed towards ICs and the citizens living in multifamily residential buildings. By the end of UP-STAIRS project (30 November 2023), the UP-STAIRS OSS in Asenovgrad has reached the following results:

- **People outreached**: **19,674 people** in total have been reached, by the following means:
  - 900 –disseminated copies of the printed UP-STAIRS brochure in the Municipal Information Centre and given to visitors of the physical office of ASEN OSS;
  - 9820 – publication of an announcement about OSS ASEN in "24 hours" newspaper from 25.08.2022 with a print run of 9820 copies. The number was given by the newspaper in a letter to Asenovgrad Municipality, № 01.09.2022 from 25.08.2022;
  - 1581 –number of visitor of the on-line publication about ASEN OSS put on the site of the Municipality;

    https://www.asenovgrad.bg/bg/saobshteniya/zveno-za-obsluzhvane-na-edno-gishe-asenovgrad-po-proekt-up-stairs
  - 1312 number of visitors of a web publication on the site of the municipality about the launch and main focuses of the national funding programme "Support for Sustainable Energy Refurbishment of Residential Building Stock - 1st stage"

    https://www.asenovgrad.bg/bg/novini/osnovni-aktsenti-ot-publikuvan-proekt-na-nasoki-za-kandidatstvane-po-protsedura-podkrepa-za-ustoychivo-energiyno-obnovyavane-na-zhilishtniya-sgraden-fond-etap-i
  - 4531 - number of visitors of another web publication on the site of the municipality with specific information about the terms and conditions of Stage I of the national funding programme "Support for Sustainable Energy Refurbishment of Residential Building Stock"

https://www.asenovgrad.bg/bg/saobshteniya/nasoki-i-prilozheniya-za-kandidatstvane-po-protsedura-podkrepa-za-ustoychivo-energiyno-obnovyavane-na-zhilishtniya-sgraden-fond-etap-i

- 632 - number of visitors of web publication on the site of the municipality with information prepared by OSS ASEN and delivered in an interview with the Deputy Mayor about the terms and conditions of the funding programme for solar PV installation on rooftops of private residential buildings:

  https://www.asenovgrad.bg/bg/novini/grazhdani-mogat-da-izprashtat-preporaki-po-programata-za-solarnite-paneli

- 898 - number of visitors of web publication on the site of the municipality with information prepared by OSS ASEN about application process for Stage II of the national funding programme "Support for Sustainable Energy Refurbishment of Residential Building Stock" (the Programme)

  https://www.asenovgrad.bg/bg/saobshteniya/nasoki-i-prilozheniya-za-kandidadstvane-po-protsedura-podkrepa-za-ustoychivo-energiyno-obnovyavane-na-zhilishtniya-sgraden-fond-etap-ii

- **People involved/recruited: 7,309 people** involved through representatives of **69** multifamily **buildings** (with **2420 apartments and 7,309 people living in them**). The data is collected by a table with requested information about the multifamily building which is filled by the IC during the meeting with a representative of that building.

  The meetings of ICs with the representatives of residential buildings, interested in energy refurbishment of their buildings, were held at the physical premises of ASEN OSS to consult them about the terms and conditions of the funding programme "Support for Sustainable Energy Refurbishment of Residential Building Stock – 1st and 2nd stages". Furthermore, 56 phone calls and 1 e-mail communication were held with the same purpose. The first deadline for the application for the Programme was 31 May 2023. The second deadline (for 2nd stage) is at the end of January 2024.

The methodology of calculating the number of recruited people is based on a formal decision to use the services of ASEN OSS and do energy refurbishment of the entire building, to be taken at the General Assembly of Owners of any particular multifamily building. According to the Bulgarian legislation, the General Assembly of Owners is the legitimate body to take decisions on behalf of the owners in multifamily residential buildings.

- **Energy savings (expected): 9,608,390 kWh/annum**. The data is taken from the energy audit reports of the buildings consulted by OSS ASEN and willing to apply for funding for any of the stages of the Programme.
- **PV energy (to be) produced**: n.a
- **Building area refurbished (expected**): **227,374 m²** corresponding to the total building area of the 69 multifamily buildings consulted by OSS ASEN.
- **PV energy (to be) installed**: n.a
- **Associated investment**: **13,520,000 Euro.** The data is taken from the energy audit reports of the buildings who were consulted to apply for funding.
- **Number of energy communities supported – 20.** The number is based on the number of buildings whose owners already formed Association of Owners to refurbish their entire building and applied for funding to the Programme at the first stage of the application process (deadline 31 May 2023).

4.5 Rhodoshop OSS

Rhodoshop OSS joined the UP-STAIRS community since 1 June 2023 as the fifth pilot partner. Rhodoshop is a building renovation OSS located in Smolyan, Bulgaria, hosted by the Association of Rhodope Municipalities (ARM) consisting of 11 municipalities. It has been active in public building energy refurbishment, and with the participation in UP-STAIRS project Rhodoshop OSS extended its services to the private residential sector in the Rhodope Region of Bulgaria. The team of Rhodoshop OSS consists of 4 ICs with significant background in building energy renovations and was additionally trained in the various relevant aspects of UP-STAIRS training programme.

The focus of Rhodoshop OSS activities has been on advice to citizens living in both single-family houses and multifamily residential buildings. Due to the late inclusion as a pilot which allowed for quite limited time for actual operation, the monitoring in Rhodoshop OSS has covered only the last ~~five~~ six months of the project. From 1 June until 30 November 2023 Rhodoshop OSS has reached the following results:

- **People outreached: 4,617 people**. Various ways of communication were used such as Media publications, ARM offline documents, Facebook account, Twitter account, UP-STAIRS promotional brochure. Proofs can be presented upon request and/or can be found at:
    - Links to online media;
    - Screenshots;
    - Video;
    - Articles;
    - Press release;
    - ARM Annual Action Plan 2022;
    - ARM Annual Action Plan for 2023;
    - ARM UP-STAIRS Brochure/flyer in PDF;
    - Facebook account https://www.facebook.com/profile.php?id=100093901691341;
    - Twitter account https://twitter.com/Rhodoshop_ARM

- **People involved/recruited 3,011 people**. These are residents of both multifamily buildings (who received advice either in person or through their representatives) and single-family houses. They were recorded by offline questionnaires and email messages.

- **Energy savings (expected)**: 3,521,675 kWh/y. These data are taken either from the audit reports of the advised multifamily buildings applying for funding under the “National programme for energy efficiency in multifamily buildings” in Bulgaria, or in case of lack of audit, based on audit results of similar buildings;

- **PV energy (to be) produced:** n.a.
- **Building area (to be) refurbished**: 60,497 m². Data is obtained ~~are taken~~ from the audit reports / technical passport or from citizens living in ~~of~~ the advised multifamily buildings applying for funding under the “National programme for energy efficiency in multifamily buildings” in Bulgaria;

- **PV energy installed**: n.a.

- **Associated investment**: 6,224,018 **Euro.** Data are taken from the audit reports of the advised multifamily buildings applying for funding under the “National programme for energy efficiency in multifamily buildings” in Bulgaria.
- **Number of energy communities supported – 2.** These are two multifamily buildings which formed energy communities to refurbish the entire building. The establishment was done before 1 June 2023 (formal opening of Rhodoshop OSS) but was a result of Rhodoshop operation which started earlier after the initiation of its accession to UP-STAIRS.

The above results were achieved through advice provided by Rhodoshop OSS to representatives of 64 buildings, of which 19 buildings have been consulted on “Support for sustainable energy renovation of the residential building stock – phase 2” programme and 45 buildings **-** on “Support for energy from Renewable Sources in the households” programme. 57 of the consulted buildings are multifamily buildings while **7** are single family houses.

5. Comparison between GA KPIs and UP-STAIRS Results

The following table shows the results from comparing Impact Indicators (KPIs) foreseen the UP-STAIRS GA and the actual results achieved by the pilot OSSs:

Table 2: KPI Summary

Parameter	Unit	GA Target	UP-STAIRS result	Difference
People outreached	number	30000	70655	40655.0
People involved/engaged	number	10000	15765	5765.0
Expected energy savings	GWh/y	21	21.8	0.8
PV energy (to be) produced	GWh/y	no target	110.0	110.0
Building area (to be) refurbished	m²	320000	389562.0	69562.0
PV energy (to be) installed	MW	no target	78.6	78.6
Associated investments	Meuro	66	134.8	68.8
Energy communities assisted or inspired	number	no target	321	321

It can be seen from the above table that for all foreseen KPIs, the UP-STAIRS pilots have achieved and for most of them have exceeded the promised in the GA. Thus, there are **more than twice as much people outreached and by about 50 % more people involved/engaged** in advice and consultation activities, compared to the **GA targets**. Also the results of **foreseen investments are more than double compared to the promised ones.** The figure about **building area to be refurbished** as a result of UP-STAIRS activities **is by almost 70 thousand square meters higher of** the foreseen in the GA, whereas **the figure about energy savings**, **is equal (even a bit higher) to the foreseen in GA** in spite of the fact that two of the pilots (AMB and Upper Austria) in the course of activities have started to promote and advice on PV energy installation in buildings, which was not initially foreseen but the market conditions in these two pilots proved it necessary. Following this, there are results related to PV energy installation on buildings that have no KPI targets but given their nature to replace conventional energy consumption, they can be deemed to represent energy savings and can therefore be added to the figure of expected energy savings. If the expected PV energy (to be) produced as a result of UP-STAIRS activities, is added

to the expected energy savings, the result is **almost 132 GWh/y energy saved** which is **more than 6 times bigger** than the **foreseen KPI** from the GA**.**

In addition to the GA KPIs, in order to present the results achieved in **contributing to collective actions**, UP-STAIRS monitoring covered also the **number of energy communities** assisted or inspired by pilot OSSs activities, which are **321** in total.