Project duration: 1st September 2020 – 29th February 2024

Grant Agreement number: 892749 (Coordination and Support Action)

WP: 4. Deliverable 4.2: Citizen Hub model agreement including quality control system for the business model elements and monitoring protocols for evaluation of partners' activities

Lead beneficiary: GNE

Submission Date: February 2024

Dissemination Level: Public

Due date: M12

Revision History:

DATE	VERSION	AUTHOR/CONTRIBUTOR	REVISION BY	COMMENTS
17/04/2023	0.1	Renaud Muller (GNE)	Álvaro Salamanca (GNE)	
02/05/2023	0.2	Renaud Muller (GNE)	Álvaro Salamanca (GNE)	
19/05/2023	0.3	Álvaro Salamanca (GNE)	Ana Sanchis Huertas (IVE)	
18/07/2023	0.4	Ana Sanchis Huertas (IVE)	Haico van Nunen (BHG)	
27/07/2023	0.5	Haico van Nunen (BHG)	Oubbol Oung (RTDM)	
25/08/2023	0.6	Oubbol Oung (RTDM) Ariane Lelieveld (RTDM)	Álvaro Salamanca (GNE)	
17/09/2023	0.7	Álvaro Salamanca (GNE)	Valentina Cabal (GNE)	
23/01/2024	Final	Álvaro Salamanca (GNE), Oubbol Oung (RTDM)		

Table of Contents

1   Executive Summary

This document contains the methodologies for the monitoring of their activities and Key Performance Indicators (KPIs) agreed with the two pilots of the Save the Homes project located in Rotterdam and Valencia. It includes:

- The description of the monitoring methodology for the development of relevant KPIs and its data collection strategy.

- The most relevant Business Model KPIs, including the pre-defined ones and those that are already in use. These Business Model KPIs cover the following key aspects of the OSS Business Model proposed for the Save the Home project, adapted to the reality of each pilot:

    o Citizen Hub Sustainability.

    o Pipeline, support and execution of renovation projects.

    o Economic impact.

    o Environmental impact.

    o Social impact.

    o Contractors and partnerships.

- Quality control monitoring as an essential activity at each phase of the customer journey.

It should be highlighted that, when this agreement was reached, both pilots were already providing OSS services, accompanying the citizens throughout the home renovation journey. In this sense, they already had in place some monitoring and control models, including some KPIs.

The methodologies and KPIs contained in this document were agreed upon with the two Save the Homes pilots during two meetings held before the drafting and proposal of this document, as well as in the 6th and 7th Consortium Meetings of the project. During these meetings, it was confirmed that:

1) The two OSS pilots are already using some of the KPIs collected in this document.

2) Each of the pilots contributed to the definition of the necessary KPIs for a comprehensive monitoring of their activities adapted to their situation.

3) Both pilots agreed to try to implement the KPIs not used so far and collected in this document during the months after the two Consortium Meetings.

4) After this period, the Save the Homes project partners will be informed of the final KPIs implemented in each pilot, their final disposition and periodicity of measurement. Therefore, this deliverable is subject to being updated at the end of the project, potentially including an annexe indicating the new KPIs that each pilot has ultimately incorporated into their measurement systems.

5) This report builds on work presented in deliverables D2.4, D3.3, and D3.8 of the project.

6) This deliverable is also intended to serve as a guide for the replication of other Citizen Hubs by establishing a data-driven management strategy.

2   Introduction

The Save the Homes project supports the launch of One-Stop-Shops as Citizens' Hubs to support the decision-making process for integrated building and dwelling renovations. The overall aim of Save the Homes is to contribute to an increase of an annual renovation rate of > 5% by offering attractive OSS services to homeowners, managed and implemented by municipalities as being trustworthy entities for citizens.

This is achieved by the implementation of the OSS Citizen Hub concept, offering renovation offices, both as physical hubs and web-based virtual hubs at the local level based on the concept of medium-sized cities and to maximize replicability, at the national and EU levels.

The integrated housing renovation services of the Save the Homes project were created within the framework of already established OSS networks in the cities of Rotterdam (The Netherlands) and Valencia (Spain), building on already well-established energy targets and networks in the cities, providing a new method and mechanism to enhance existing interactions between relevant organizations and stakeholders.

In addition, the Save the Homes project proposes a monitoring methodology and a quality control system to build a data-driven approach to the management of a Citizen Hub and to evaluate the activities of the partners. For this purpose, this report clearly defines a monitoring methodology focused on the Citizens Hub business model, adapted to each of their local contexts, with well-defined KPIs.

This report builds on the work presented in deliverables D2.4, D3.3, and D3.8:

D2.4 - *Mapped suitable protocols and methods for quality control of the renovation works and for buildings performance monitoring*.

D3.3 - *Citizen Hub business model for the two pilots*.

D3.8 - *Data monitoring plan for the two pilots*.

The already available methods, tools and services suitable for the renovation process, beyond the holistic home renovation personal assistance offered by the Citizen Hub, were mapped in D2.4.

A business model was developed in D3.3 to assess the feasibility of two new Citizen Hubs. Business model, financial projections, and budget estimations were developed.

The data monitoring plan was developed in D3.8. It gives a detailed presentation of the different customer journeys and presents the minimum pipeline KPIs that should be monitored.

With the successful launch of two Citizen Hubs in Rotterdam and Valencia, the hypothesis of the business case now faces the reality of market fit. For the final drafting of this agreement, two meetings were held with the pilots in Valencia and Rotterdam, as well as an exchange of e-mail communications to check the suitability of the agreement:

- At the first meeting held on 17 February 2023, a series of KPIs for monitoring the activities of their offices were presented. At that time, both cities reported their feedback for an adaptation of the KPIs to each Citizen Hub, indicating the idiosyncratic nature of their local communities and the particularities of each of the cities.

- After that meeting, on 1 March 2023 second version of the KPIs was sent to the pilots, including the comments and feedback received during the first meeting.

- During the 6th Consortium Meeting held on March 28th, 2023, the final version of the KPIs was presented to all beneficiaries of the project. Both pilots confirmed their intention to include in their measurements those KPIs they were not yet using.

  The pilots remarked that due to their own nature of public administration and the limited number of resources, in certain cases they will not be able to implement all the proposed KPIs and their methodologies, or the suggested collection periodicity may differ from this agreement. It was established that this document will continue to include the KPIs shown here and their methodologies so that they can be replicated in other OSS at national and European levels.

- At the 7th Consortium Meeting held on September 19th, 2023, it was agreed that this deliverable might be updated at the end of the project. An annexe would be included in which both pilots might indicate the new KPIs they have incorporated into their monitoring and measurement systems, which were not being used before.

The following chapters, in addition to the different quality control systems and proposed monitoring protocols, also include a brief description of those already in use by pilots, as well as a description of some basic concepts to guide the reader.

3   Monitoring methodology

3.1 Strategy for the development of relevant KPIs

This section presents general concepts and objectives to consider when creating Key Performance Indicators (KPIs) for the pilots of Rotterdam and Valencia. Those are matched to the Citizen Hub project's business model and data collection strategy, creating the monitoring methodology.

General concepts:

KPIs could be financial or non-financial measures used to quantify the level of achievement of distinct goals. They reflect the performance of an entity and are reflected in its strategic plan. Being monitoring tools, KPIs need to portray efficiently the evolution of a situation. The design of relevant KPIs follows established guidelines to show the progress in a process.

Since evolution is measured in a given period, it must then have a time-related component. Factors that influence the decided period length are usually related to data availability and general project objectives. When used to monitor operations, KPIs can help managers make data-driven decisions but also validate their effectiveness once implemented.

Quantitative values let measured data show evolution. When qualitative monitoring is needed, managers must transform the qualitative scale into a quantitative one. Review scores rated in per cent or on a 5-star scale are an example of transformation.

The monitoring of KPIs is usually composed of three data points:

- Actual.

- Planned

- Baseline.

The recorded result at the end of the defined period length is called the Actual score. It has to be compared to interpret variation. The Planned and Baseline scores serve that purpose. Baseline performance is set once at the proposal level of a project.

The data point in the business model in D3.2 *Citizen Hub business model for the two pilots* is the baseline of this monitoring strategy. At the start of the project, actual performance is compared to the baseline performance. When the baseline is not met, a mitigation strategy can be defined. If the associated objectives differ from the baseline, the planned score has to be defined and will serve as the new reference point.

Objectives:

In the previous agreement between the Save the Homes project and the Citizen Hubs in Rotterdam and Valencia, it was established that the development of a common methodology for monitoring their processes would be carried out based on the development and control of different KPIs. This monitoring agreement includes:

- The control and the evolution of the economic sustainability of the Citizen Hub -> **Citizen Hub sustainability KPIs.**

D4.2 - **Citizen Hub model agreement including quality control system for the business model elements and monitoring protocols for evaluation of partners' activities**

SAVE THE HOMES

- The analysis of the energy refurbishment projects for buildings and dwellings, considering each of the phases of the customer journey, from the activities taken before a citizen decides to enter the OSS until the decide to carry out the refurbishment to the completion of the works (promotion and dissemination activities) -> **Pipeline, support and execution of project KPIs.**

- The economic, environmental and social impact generated by the Citizen Hub through all its performances -> **Economic Impact, Environmental Impact and Social Impact KPIs.**

- The relation of each OSS with the available workforce for the execution of the rehabilitation works, having control of the existing contractors and freelancers, the partnerships that were reached and the valuation attributed to them -> **Partnerships and Contractors KPIs**.

3.2 Data collection strategy

This section presents the data collection methodology to be implemented in each pilot. A briefing on their functionality and essential design considerations will be followed by an example of relevant metrics they can support.

Accessibility of data represents the time it takes to gather and clean datasets. KPIs that are time-consuming to produce tend to be abandoned throughout the life of the project. When designing KPIs, managers have to look first into existing systems.

The different data collection models are presented below, grouped into two distinct groups:

- **Business models, financial planning, Enterprise Resource Planning (ERP), and Customer Relationship Management tools (CRM)** are effective sources of data. KPIs that can be automated using existing systems should be prioritized.

  Customer relationship management (CRM) software is essential for Citizen Hub activities. The data collected by the software lets managers track in detail the conversion rate between stages of the customer journey. Datapoints can be exported and used as an actual score for KPIs.

- **Operational budget and expense accounts**, as well as **customer dossiers, surveys, exit surveys and renovation proposals**, are also other sources of easily accessible data.

  Citizen Hub managers would likely use any kind of accounting software. Several relevant KPIs can be extracted from this dataset. The operational budget tools used by Citizen hubs have automated reporting tools that will be useful for the monthly reporting activities.

  Another great data collection tool is the use of a survey throughout the customer journey. Carefully designed surveys are useful to understand any qualitative measure managers would like to monitor. In the case of actual construction phase monitoring, a survey is the only way to record an assessment of the works.

A combination of the two groups mentioned above is the recommendation of the Save the Homes project for each of its pilots so that the collection of the data needed to monitor their activities can be as effective and reliable as possible.

It is important to mention that the initial objective of the project guided the selection of KPIs and data collection methods. The business model integrates scope, budget, and timeline expectations that are

translated to a baseline data point. Those data points could be considered as a hypothesis to be tested by the project.

Multiple data points can be found in the proposition. Since the Save the Homes activities were undertaken from 2022 to 2024, baseline data points should only cover this period.

Table 1 – Baseline datapoints

	Valencia			Rotterdam		
Monitored years	2022	2023	2024	2022	2023	2024
Number of retrofits	250	500	500	16	150	525
Total Citizen Hub costs	€407,375	€494,925	€503,000	€52,336	€144,720	€354,720
Total Citizen Hub revenues	€143,000	€343,000	€537,300	€29,040	€66,600	€168,100
Number of web visits	15000					

During the meetings held with each of the pilots it was established that they are successfully using the following methods to collect data:

- Operational budget.

- CRM system (case of Valencia).

- Customer dossiers (case of Rotterdam).

- Surveys.

- Exit surveys.

- Proposals of renovation.

- Surveys for contractors, freelancers and partnerships.

4   Business model KPIs

This chapter shows the considered relevant KPIs to monitor completely and effectively the different aspects of the business model of each of the pilots, serving as a basis for their replication at the national and European levels.

The agreement reached at the 6th Consortium meeting shows the commitment of the Valencia and Rotterdam Citizen Hubs to incorporate, as far as possible, those KPIs that are within the scope of their possibilities and are not yet being measured.

4.1   Citizen Hub's singular characteristics

This first section of the chapter shows the significant differences between the reality faced by the two cities in the energy refurbishment of buildings and dwellings, a fact that generates a significant difference between each of the KPIs selected for each business model.

The scale, scope, and customer journey differ on some points. Further details can be found in Deliverable 3.3 and Deliverable 3.8.

4.1.1 Rotterdam

The Rotterdam initiative is a bottom-up approach operated by Alex Energy, an energy community. The scale of the project is the smaller of the two, aiming for the rehabilitation of 691 dwellings over the project period.

Regarding KPIs relevance, the main difference is related to the entry of new customers in the pipeline. Alex Energy focuses on information events to bring in new clients and does not have a physical office. Walks-in are not relevant to the Rotterdam initiative. The number of dwellings represented in each information meeting deals more accurately with its method. Another point to note is that the Citizen Hub Rotterdam does not have a CRM system.

The renovation projects in Rotterdam are a matter of community initiatives involving single-family dwellings. Usually, there is one representative per community involving more than one home. Community representatives get in touch with the Citizen Hub through these in-person information events mentioned above.

The structure for monitoring mentioned in Chapter 3 starts with existing information. Rotterdam uses a bottom-up approach, which means that small initiatives are clustered, and looked at how to grow. Some of these initiatives are a success, and some of them are not. In most cases, there is no professional organisation behind this initiative before the realisation of the renovation. As a result, CRM systems, surveys or pipelines are not in view. We agreed that the information mentioned above is useful and leads to a better insight into all actions. The task at hand in Rotterdam, concerning quality control is how to implement these KPIs rather than already using the data that is gathered.

4.1.2 Valencia

The Valencia initiative has a much larger scale, with an expected reach of 1,250 dwellings between 2022 and 2024. The top-down approach is made possible by the endorsement of the local government. Since public income is expected, particular attention was given to the revenue aspect of the Citizen Hub. A KPI was selected to measure the profitability of the Citizen Hub.

The scope of work considers both single-family dwellings and multi-family buildings. Multi-family buildings count with one representative (property administrators managing condominiums).

The Citizen Hub in Valencia is a network of physical offices, which in this case do have a CRM. Also, Valencia provides support to its customers after the refurbishment of their homes, which is not the case in Rotterdam.

4.2 Citizen Hub Sustainability

The Citizen Hub Sustainability KPIs serve as an administrative guideline for the manager to quickly understand the financial viability of the project. The following tables present relevant KPIs created in collaboration with the Citizen Hubs managers to assess the Citizen Hubs' sustainability.

Table 2 – Citizen Hub Sustainability KPIs - Rotterdam

Operational KPI - Rotterdam	Monitoring rate	Gathering method
Costs	Monthly	Budget
Operating margins	Monthly	Budget
Number of public loans or subsidies mobilised	Monthly	Budget

The Costs KPI (it applies to both pilots) serves as a simple guideline for managers to understand how their actual expenses vary with their activities. It is measured by the sums of all operational expenses of the Citizen Hub: Salaries, fixed costs, advertisement, etc. The baseline objective for Valencia and Rotterdam is taken from the proposal and is presented in section 3.2. Actual data can be found through the operational budget. For example, managers can use this KPI to monitor potential cost overruns after a new advertisement campaign is launched:

Selected KPI #1 - Costs

$$Costs = \ Operational\ expenses$$

The Operating margins KPI measures the profit ratio of sales before paying taxes and interests. It is calculated by dividing a company's operating income by its sales (revenue). A high ratio indicates more profitable activities.

Data comes exclusively from the operational budget. The revenue considered here is only from private sources. No baseline objectives for profitability have been determined yet.

Selected KPI #2 – Operational Margins

$$Operational\ Margins = \frac{Operating\ Income}{Revenue} = \frac{Revenue - Variable\ costs}{Revenue}$$

The **Number of public loans or subsidies mobilised KPI** refers to the total amount of public loans and subsidies received by the OSS to enable it to operate.

Table 3 – Citizen Hub Sustainability KPIs – Valencia

Operational KPI - Valencia	Monitoring rate	Gathering method
Costs	Monthly	Budget
Revenue to OPEX ratio	Monthly	Budget
Number of public loans or subsidies mobilised	Monthly	Budget

The Revenue to OPEX ratio KPI, also named as Operating Expense Ratio (OER) is the ratio between the total operating expenses and the revenues from operations. The lower this KPI is the more sustainable the business model is. Data inputs for OER KPI are also taken from the operational budget.

Selected KPI #3 – Revenue to OPEX ratio

$$OER = \frac{Operational\ expenses}{Revenues}$$

The Rotterdam HUB is not a fixed place, with people staffing it. Therefore not all KPIs can be measured. Alex Energie is based on volunteers, and there is a targeted amount of money available. This is not related to monthly costs. These three KPIs can be of use when setting up a permanent HUB.

4.3 Pipeline, support, and project execution

These KPIs are useful for understanding the performance of the offices and potential bottlenecks of different phases of the project. Detailed analysis of the customer journey and pipeline implication was discussed in Deliverable 3.8. This section presents the selected relevant KPIs for the two Citizen hubs according to the nature and the singular characteristics of each of them described in section 4.1 of this document.

One of the hypotheses of the Citizen Hub business model is about the effectiveness of communication channels, the first step to consider in the customer journey. While comprehensive reporting of KPIs in the promotion and dissemination phase is not mandatory, it is recommended that these activities will be measured in order to allow managers to know the results of their efforts in attracting real contacts.

D4.2 - **Citizen Hub model agreement including quality control system for the business model elements and monitoring protocols for evaluation of partners' activities**

SAVE THE HOMES

How Rotterdam and Valencia capture different potential contacts is a fact that results in a completely different selection of KPIs for this phase of the customer journey between the two cities.

It is also important to emphasise at this point that, the greater range in the types of housing considered by the Valencia Citizen Hub results from a greater selection of KPIs for this city.

Table 4 – Pipeline, support and execution of the project KPIs - Rotterdam

Operational KPI - Rotterdam	Monitoring rate	Gathering method
Number of events	Monthly	Customer dossiers
Number of attendees at events	Monthly	Customer dossiers
Number of new contacts by events	Monthly	Customer dossiers
Monthly conversion rate by events	Monthly	Customer dossiers
Number of dwellings included in the new contacts	Monthly	Customer dossiers
Number of technical advice meetings	Monthly	Customer dossiers
Monthly technical advice conversion rate	Monthly	Customer dossiers
Number of dwellings included in the technical advice meetings	Monthly	Customer dossiers
Number of financial advice meetings	Monthly	Customer dossiers
Monthly financial advice conversion rate	Monthly	Customer dossiers
Number of dwellings included in the financial advice meetings	Monthly	Customer dossiers
Number of rehabilitation works	Monthly	Customer dossiers
Monthly rehabilitation works conversion rate	Monthly	Customer dossiers
Average time/user by phase of the customer journey	Monthly	Customer dossiers
Type of interventions hired in the construction phase	Monthly	Exit survey
Positive reviews score	Monthly	Exit survey

The **Monthly Conversion Rate KPIs** represent both pilots, depending on the phase of the customer journey:

- The proportional number of potential contacts that went from the promotion and dissemination phase in the customer journey to becoming real contacts that decided to renovate their homes with the Citizen Hub: a high ratio shows that the Citizen Hub communication and customer support are performing adequately. Managers can address changes in low ratios by exploring different ways of communication and support.

- The proportional number of contacts that received technical advice, financial advice or began rehabilitation works on the number of contacts generated. They represent the overall effectiveness of the Citizen Hub Initiative in each phase.

  No baseline objectives were stated for the number of contacts and conversion rates, but managers can use the rehabilitation objectives highlighted in section 3.2 of this document. The actual number of rehabilitations completed has to be taken from exit surveys and updated in the Customer dossiers or CRM. Managers seeing a variation in the ratio can explore the customer journey in more detail to find the bottleneck.

Because Rotterdam is a bottom-up approach, it is mainly orientated on a project level. This means that there is no continuous flow of people asking for advice, but at certain times Alex Energie reaches out to people. This can be via billboards, a community meeting or via their website. This causes spikes in the KPI.

Selected KPI #4

$$Selected\ Advice\ or\ Rehabilitation\ conversion\ rate = \frac{Total\ Selected\ Advice\ or\ Rehabilitation\ works}{Total\ Contacts}$$

Table 5 – Pipeline, support and execution of the project KPIs - Valencia

Operational KPI - Valencia	Monitoring rate	Gathering method
Number of first approaches by calls from potential contacts	Monthly	CRM
Number of first approaches by walk-ins of potential contacts	Monthly	CRM
Number of first approaches by emails from potential contacts	Monthly	CRM
Number of web visits by single-users	Monthly	CRM
Total number of first approaches of potential contacts	Monthly	CRM
Number of new contacts by calls	Monthly	CRM
Monthly conversion rate by calls	Monthly	CRM
Number of new contacts by walk ins	Monthly	CRM
Monthly conversion rate by walks ins	Monthly	CRM
Number of new contacts by emails	Monthly	CRM
Monthly conversion rate by emails	Monthly	CRM
Number of new contacts by web visits	Monthly	CRM
Monthly conversion rate by web visits	Monthly	CRM
Total number of new contacts of single-family dwellings	Monthly	CRM
Total number of new contacts of multi-family buildings	Monthly	CRM
Total number of new contacts	Monthly	CRM
Monthly conversion rate by total contacts	Monthly	CRM
Number of dwellings included in the new single-family contacts	Monthly	CRM
Number of dwellings included in the new multi-family building contacts	Monthly	CRM
Number of multi-family buildings included in new multi-family building contacts	Monthly	CRM
Total number of dwellings included in the total number of new contacts	Monthly	CRM
Number of workshops/sessions	Monthly	CRM
Monthly workshops/sessions conversion rate	Monthly	CRM
Number of dwellings included in workshops/sessions (single-family)	Monthly	CRM
Number of dwellings included in workshops/sessions (multi-family buildings)	Monthly	CRM
Number of multi-family buildings included in workshops/sessions	Monthly	CRM
Total number of dwellings included in workshops/sessions	Monthly	CRM
Number of technical advice meetings	Monthly	CRM
Monthly technical advice conversion rate	Monthly	CRM
Number of dwellings included in technical advice meetings (single-family)	Monthly	CRM
Number of dwellings included in technical advice meetings (multi-family buildings)	Monthly	CRM
Number of multi-family buildings included in technical advice meetings	Monthly	CRM
Total number of dwellings included in the technical advice meetings	Monthly	CRM
Number of financial advice meetings	Monthly	CRM
Monthly financial advice conversion rate	Monthly	CRM
Number of dwellings included in financial advice meetings (single-family)	Monthly	CRM
Number of dwellings included in financial advice meetings (multi-family buildings)	Monthly	CRM
Number of multi-family buildings included in the financial advice meetings	Monthly	CRM
Total number of dwellings included in the financial advice meetings	Monthly	CRM
Number of dwellings included in rehabilitation works	Monthly	CRM
Monthly rehabilitation works conversion rate	Monthly	CRM
Number of dwellings included in the rehabilitation works (single-family)	Monthly	CRM
Number of dwellings included in the rehabilitation works (multi-family buildings)	Monthly	CRM
Number of multi-family buildings included in the rehabilitation works	Monthly	CRM
Average time/user by phase of the customer journey	Monthly	CRM
Type of interventions hired in the construction phase	Monthly	Exit survey
Positive reviews score	Monthly	Exit survey

4.4 Economic, Environmental, and Social Impact

Economic, Environmental, and Social KPIs are presented in the same way for both pilots. This set of KPIs shows the real success that describes the fulfilment of the final objectives of an OSS for the energy retrofitting of dwellings.

The following KPIs have been selected by Citizen Hubs managers:

Table 6 – Economic impact - Rotterdam & Valencia

Operational KPI	Monitoring rate	Gathering method
Investment triggered	Monthly	Proposal and Exit survey
Jobs created	Monthly	Proposal and Exit survey
Amount of public loans or subsidies mobilised	Monthly	Proposal and Exit survey

Research shows[1] that for each million triggered investments in the rehabilitation sector, 18 local jobs are created in Spain. From Valencia's business model, 1250 dwellings totalling approximately 17.35M euros are planned.

The **Investment triggered** and the **Amount of public loans or subsidies mobilised KPIs** refers to the total amount of investments in any form (including private loans), public loans and subsidies mobilised by the citizens advised by the OSS.

Table 7 – Environmental impact - Rotterdam & Valencia

Operational KPI	Monitoring rate	Gathering method
Monthly gwh/y saved	Monthly	Proposal and Exit survey
Monthly tCO2eq/y saved	Monthly	Proposal and Exit survey

Table 8 – Social impact - Rotterdam & Valencia

Operational KPI	Monitoring rate	Gathering method
Health and air quality benefits reviews	Monthly	Exit survey
Satisfaction survey at the end of each phase	Monthly	Exit survey

The first project is finished. Based on these dwellings a baseline can be established for future renovations.

---

[1]https://www.renovate-europe.eu/2020/06/10/building-renovation-a-kick-starter-for-the-eu-economy/#:~:text=For%20every%20%E2%82%AC1%20million,economic%20activity%20across%20the%20EU

4.5 Contractors

The Citizen Hub approach builds on strong ties with the local construction ecosystem. The business model's success relies on the participation of several actors in the value chain. Consultation with Citizen Hub Managers has produced the following list of monitoring elements.

Table 9 – Contractors - Rotterdam

Operational KPI - Contractors Rotterdam	Monitoring rate	Gathering method
Value of works done by contractor	Monthly	Survey
Average number of contractors required by type of interventions	Monthly	Survey
Contractor availability by type of interventions	Monthly	Survey

The first project is finished. Based on these dwellings a baseline can be established for future renovations.

One of the challenges stated by managers of the Citizen Hub of Rotterdam is the level of availability from local contractors, they do not work based on partnerships as Valencia, but based on freelancers. As an example, the work in the first buildings was done by self-employed labourers instead of one contractor.

The Contractor availability by type of interventions KPI in the case of Rotterdam has been designed to address this challenge. By using data from the exit survey, managers of Citizen Hub can measure the type and the volume of rehabilitation works waiting for contractors. Rehabilitation works can be split between type, number, and contractor's name based on available data. This KPI must tend toward 0 for all types of work which would indicate a reduced waiting list for the procurement of contractors for rehabilitation works. Managers can address the availability challenge by putting more effort into finding a suitable contractor with specific expertise. The number of pending rehabilitations is an excellent argument to bring in new contractors.

Table 10 – Partnerships - Valencia

Operational KPI – Partnerships Valencia	Monitoring rate	Gathering method
Number of new partnerships	Monthly	CRM
Number of works done by recommended partner	Monthly	Survey + CRM
Value of works done by recommended partner	Monthly	Survey + CRM
Review score for each partner	Monthly	Survey + CRM
Contractor availability	Monthly	Survey + CRM

The partners review score gives a clear picture of the appreciation of services by clients. Partners include contractors, financial institutions, technical expertise providers, and regulatory entities emitting permits. Citizen Hub of Valencia could gather data through the exit survey following the completion of the works. The lists of partners should be maintained in the project CRM.

Selected KPI #5 – Partners' score

$$Partners\ KPI\ =\ Review\ score\ by\ partners$$

- What is your satisfaction score for each service provided by the Citizen Hub?
- What is your satisfaction score for each contractor used for your rehabilitation works?

4.6 KPIs currently measured by each of the pilots

4.6.1 Rotterdam

The pilot has been led by the energy cooperative Alex Energy. When needed Alex Energy has been advised by partners of the consortium of Save the Homes like Bouwhulpgroep, Huygens, GNE and the city of Rotterdam.

The first pilot street (named 'the architect street') for collective renovation has been run successfully from start to end by a project team of Alex Energie. Alex Energie has managed the renovation process by proposing a customised approach wherein the wishes of initially 16 homeowners were central. For the collective renovation, they have organised a building collective consisting of work coordinators and freelancers craftsmen. Out of the 16, 8 of the homeowners have wished to join a collective renovation process. Looking at the scale of the first pilot street, Alex Energie did not need yet a Customer Relation Manager system. For the follow-up of the first pilot street and with the aim of identifying potentials for upscaling renovation, Alex Energie has started activities to sound new needs in various neighbourhoods in the area of Prins-Alexander. Some KPIs are based on these activities, which has led to a collective purchase of solar panels as a popular action which may lead to a follow-up.

When considering the KPIs measured by each of the pilots, Alex Energie should be the organisation providing the information. Here below, are the types of KPIs provided by Alex Energie. In addition, Rotterdam as a local authority can provide information based on the loans taken in Rotterdam at a neighbourhood level. Furthermore, documents related to KPIs for setting up and running for 3 years a one-stop-shop named the Duurzamheidswinkel can be found on the website of project TRIPLE-A Interreg2seas: HOME (triple-a-interreg.eu).

After consulting with Alex Energie, the following KPIs have been identified as the 5 minimum measurable KPIs.

KPI #1 Number of meetings carried out. These can be divided into 2 categories:

- Start meetings taking place in the neighbourhoods with the aim of creating involvement, and commitment of participants.

- Meetings to provide information and/or knowledge (on for example how to use thermoscans, energy coaching etc).

KPI #2 Number of measures implemented counted per type of measures:

- PV-panels.

- Insolation measures (floor, roof, façade, glazing).

- Heat pumps.

KPI #3: Developed types of services:

Initially with various approaches, that, for example, lead to upscaling, such as a task force that can execute an intensive approach, as well as the thermal scan and the associated training for 13 residents, and furthermore, the deployment of local energy coaches. Making homes gas-free-ready, etc.

KPI #4: Developed collaborations with organisations relevant to the realisation of a Citizen Hub.

In the case of Alex Energie: Buurkracht, Energiebank, Energie van Rotterdam (EvR), HOOM, task force. Working groups with residents participating in the implementation.

KPI #5 Number of memberships to the energy cooperative. Herein, a difference can be made between:

- Number of passive members.

- Number of active members in the various working groups and their parts.

In addition, the city of Rotterdam can also provide **data related to the use of the Rotterdam Energietransitiefonds and national loans**. The KPIs related to financing renovation for homeowners (from local authorities, and owners of financing instruments) are listed below:

- Number of loans attributed.

- Amount of investments through loans.

- % of preferred types of measures proposed in the loans.

- Geographical distribution in the city, per neighbourhood.

Financing KPIs are available through dashboards in the Rotterdam pilot's digital platform, where the following measures can be obtained:

- Municipal loans 'Rotterdam Energietransitiefonds'.

- National subsidies and loans.

- Rotterdam Energietransitiefonds.

Below is an example (see chart) of the dashboards accessed to obtain the previously indicated financial information. It's worth noting that all this information, as illustrated in the example, allows for categorizing the number of requested measures for each loan in each area.

Specifically, the graph displays, among the legend colours, the distribution of requested measures registered for obtaining an Energietransitie loan. The figures are given since the availability of the loans: Central heating, Roof insulation, Electrical installation, Gas installations, Facade insulation,

Glass insulation, High-efficiency boiler, Mechanical ventilation, Sewerage, Chimneys Ventilation ducts, Ventilation, Floor insulation, Heat pump, Water installations, WTW (Heat Recovery System), Solar Boiler, Solar Panels.
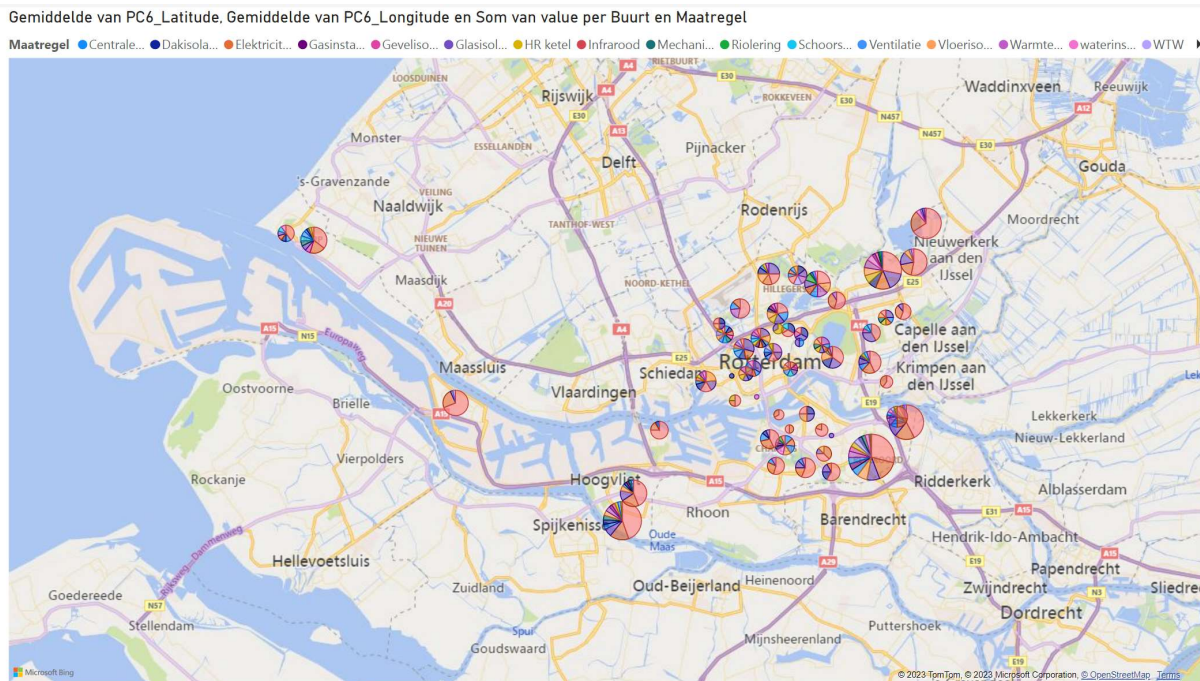

Figure 1 - Number of measures requested in all the proposals for a loan

4.6.2 Valencia

The pilot has started to monitor some of these KPIs with the difficulty of territorial and administrative fragmentation of the developed initiatives:

- Valencia Energy Office already has a quite complete and useful **CRM** implemented as a spreadsheet with internal calculations, but XALOC offices do not have harmonized follow-up mechanisms for the moment.

- **Budget** is managed at the office/municipality level, and can include, or not, the XALOC agreement grant.

- Exit **surveys** are still under development.

- **Renovation proposals** data come from the pre-diagnosis online tool (renoveu.five.es), through the stored statistics and Google Analytics.

In an attempt to unify these data sources, a form addressed to the different actors in the data collection chain is being implemented, so to centralize data and monitor the global performance of initiatives related to the Save the Homes project activities.

D4.2 - **Citizen Hub model agreement including quality control system for the business model elements and monitoring protocols for evaluation of partners' activities**

SAVE THE HOMES

Figure 2 - Monitoring form and dashboard for Valencia pilot (fake data)

This form therefore considers that different data needed for monitoring the selected KPIs lay under different profiles acting in different areas of the Citizen Hub deployment and functioning.

The KPIs that this form allows to be collected and later on visualised are described below. The methods, calculations and visualizations proposed for the monitoring dashboard present fake numbers. The real figures will be reported on D1.3 'Report on performance indicators', D1.4 'Final publishable report and executive summary of total project results' and D4.8 'Evaluation of the Citizen Hub holistic renovation services and the customer journeys', by the end of the project, with the corresponding interpretation, lessons learnt and conclusions.

L – Location data

Needed for analysis distribution of renovated or assisted in any buildings, in terms of inclusion, closeness or connexion with Citizen Hubs locations or between them, it includes:

Table 11 – Location data for Valencia pilot

KPI ID	KPI name	Answer by	Answer each...	Answer format
L01	municipality	office staff	new customer	select
L02	building address	office staff	customer	coordinates or address

- L01 considers the municipal area where the building is located and addresses the inclusion of assisted buildings inside the territory under a Citizen Hub scope and is related to the location of the Valencia Region Citizen Hubs network. It is visualized as a choropleth map representing density (number of assisted buildings inside a municipality, in a blue ramp if they have a Citizen Hub, or a grey ramp if they don't).

- L02 considers the specific address of the assisted building and addresses the closeness of assisted buildings between themselves. It represents the copycat effect. It is visualized as a unique symbol points map.

These data are collected from:

- CRM each new customer contacts the Citizen Hub.

- Reno proposals, for each building are assessed, every 6 months.

They are reported through the questionnaire, by the office staff profile, or data is imported by IT from the reno proposals web tool.
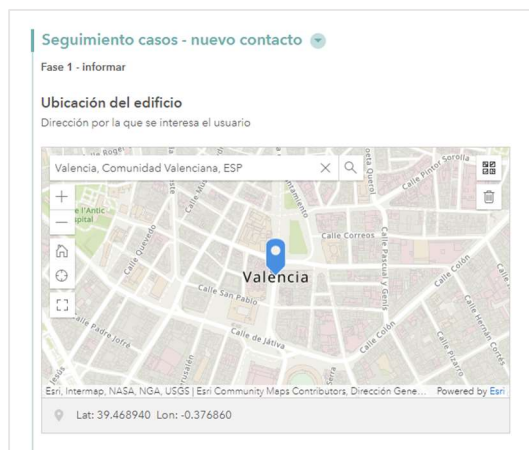

Figure 3 - Location data in the KPIs form

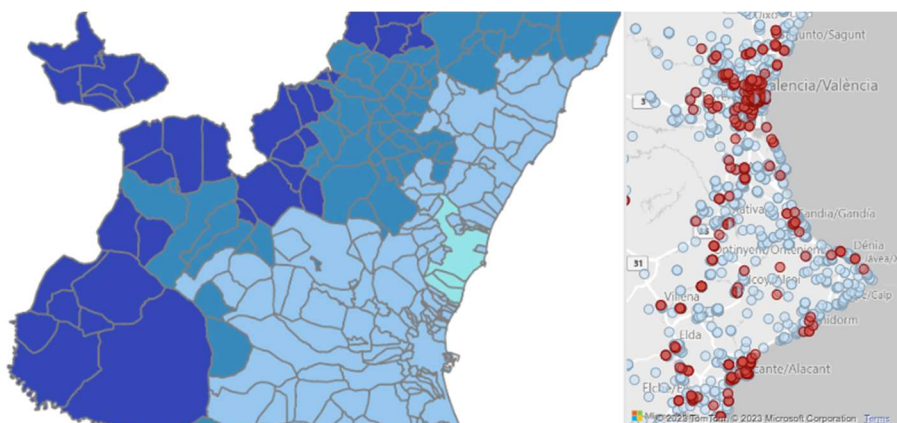So, potentially, we will visualize them as these two maps:

Figure 4 - Activity by OSS (L01) and Buildings assisted (L02)

L01 is to be visualized as a choropleth map representing density (number of assisted buildings inside a municipality, in a blue ramp if they have a Citizen Hub, or a grey ramp if they don't), and L02 is visualized as a unique symbol points map.

S – Sustainability KPIs

Needed for understanding the financial viability of the Citizen Hubs, include for Valencia Region the following data:

Table 12 – Sustainability KPIs for Valencia pilot

KPI ID	KPI name	Answer by	Answer each...	Answer format
S01	OPEX	budget resp	12M	€
S02	revenue	budget resp	12M	€
S10	OPEX/revenue	AUTO	12M	%
S20	subsidies	budget resp	12M	€
S21	OPEX/subsidies	AUTO	12M	%
S22	subsidies origin	budget resp	12M	select

- S01 addresses the operational costs of each Citizen Hub.

- S02 addresses the revenues obtained through the delivery of the different services by the citizen Hub. For the moment all services are for free, so this KPI is 0 by default.

- S10 addresses the operating expense ratio (OER), the ratio between the total operating expenses and the revenues from operations and so is related to both S01 and S02. Being S02 = 0 by default, this KPI as it is defined loses all its relevance and is alternatively substituted by S20 and S21.

- S20 addresses the funding received by the Citizen Hub from the Public Sector.

- S22 addresses the origin of those grants and can be local, regional, or other level subsidy.

- S21 addresses the operating expense ratio (OER), but regarding subsidies, this is, the ratio between the total operating expenses and the revenues from subsidies and so is related to both S01 and S21.

These data are collected from the budget of each Citizen Hub and its related grant agreements, from which public funding is obtained.

It is reported through the questionnaire, by the budget responsible profile each 12 months
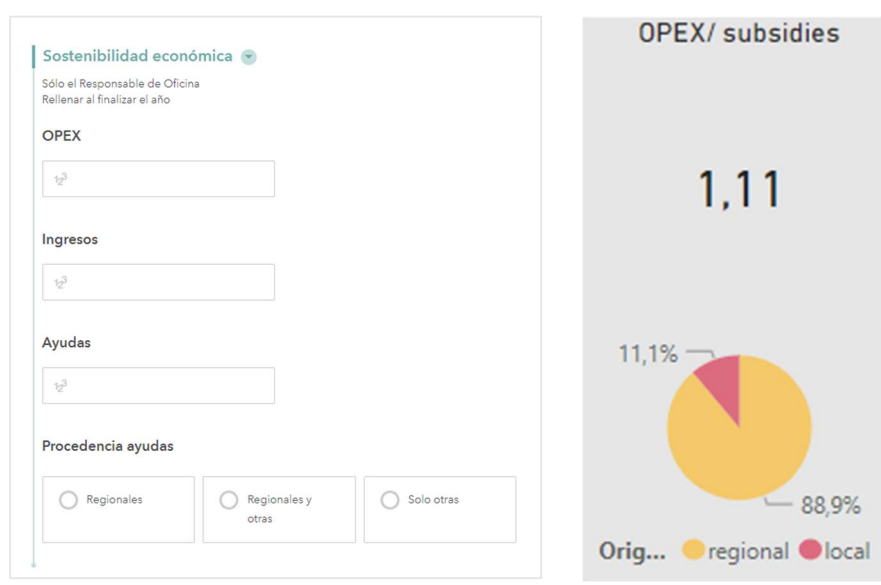

Figure 5 - Sustainability data in the KPIs form and related visualization (S20 & S21)

The main KPI here to be visualized in the dashboard is the subsidies OER (S21), as a figure, and the received funding pie chart, representing the different sources of the funding (S20).

P – Pipeline KPIs

Needed for understanding the performance of the offices and potential bottleneck of different phases of the project, they include:

Table 13 – Pipeline KPIs for Valencia pilot

KPI ID	KPI name	Answer by	Answer each...	Answer format
P01	first contact	office staff	new customer	select
P02	time contact (min)	office staff	new customer	int
P03	n dwellings =1	office staff	new customer	1/0
P10	personal meeting	office staff	customer	1/0
P11	time meeting (min)	office staff	customer	int
P12	n dwellings >1	office staff	customer	int
P19	conversion 01	AUTO	6M	%
P20	project type	office staff	customer	select
P21	professional from registry	office staff	customer	1/0
P22	satisfaction professional	office staff	customer	select
P23	subsidies applied	office staff	customer	1/0
P23-IT	subsidies applied	IT	6M	int
P24	time follow-up (min)	office staff	customer + 3M	int
P29	conversion 12	AUTO	6M	%
P30	reno works	office staff	customer + 6M	1/0
P31	subsidies got	office staff	customer + 6M	1/0
P31-IT	subsidies got	IT	6M	int
P32	professional form registry	office staff	customer + 6M	1/0
P33	satisfaction professional	office staff	customer + 6M	select
P33	time check (min)	office staff	customer + 6M	int
P39	conversion 23	AUTO	6M	%
P40	satisfaction	office staff	customer + 9M	1/0
P41	success story	office staff	customer + 9M	1/0
P42	time success story (min)	office staff	customer + 9M	int
P43	satisfaction result	office staff	customer + 9M	select
P44	time satisfaction (min)	office staff	customer + 9M	int
P49	conversion 34	AUTO	6M	%
P50	conversion 4satisfied	AUTO	6M	%

- P01 addresses the first contacts, each new customer who gets to the Citizen Hub, and registers also the channel through which the contact occurred.

- P02 addresses the duration of that first contact, in minutes, and is related therefore to P01, and registered at the same time in the CRM.

- P03 registers if a consultation regards a single-family home or terrace house, this is, buildings where the number of dwellings is 1.

- P12 registers if a consultation regards a multi-family home or apartment block, this is, buildings where the number of dwellings is more than 1 and specifies how many dwellings hold the building.

- P10 registers each personal meeting performed, by a new or recurrent customer.

- P11 addresses the duration of personal meetings, in minutes, and is related therefore to P10, and registered at the same time in the CRM.

- **P19 addresses the conversion rate from stage 0 (dissemination activities) to stage 1 (first contacts), in a number of dwellings, so it is related to P03, P12 and O06.**

- P20 addresses the definition of the project, which can be a deep or partial renovation, and marks the start of stage 1.

- P21 addresses the ratio of professionals contacted from the registry.

- P22 addresses the satisfaction level with the contracted professional.

- P23 addresses the application for renovation subsidies.

- P24 addresses the duration of the follow-up call, in minutes.

- **P29 addresses the conversion rate from stage 1 (first contacts) to stage 2 (project definition), in number of dwellings, so it is related to P03, P12, P20 and P23.**

- P30 addresses the start of renovation works, and therefore the start of stage 2.

- P31 addresses the obtaining of subsidies.

- P32 addresses the ratio of contractors contacted from the registry.

- P33 addresses the satisfaction level with the contacted contractor.

- P33 addresses the time spent on the check for renovation starting call (in minutes).

- **P39 addresses the conversion rate from stage 2 (project definition) to stage 3 (renovation started), in number of dwellings, so it is related to P20, P23, P30 and P31.**

- P40 addresses the finishing of renovation works through the offer to answer an exit survey and marks the start of stage 4.

- P41 addresses the finishing of renovation works through the offer to share the results and become part of the success stories collection.

- P42 addresses the time spent on the success story creation call (in minutes).

- P43 addresses the satisfaction level with the result of renovation works.

- P44 addresses the time spent on the exit survey call (in minutes).

- **P49 addresses the conversion rate from stage 3 (renovation started) to stage 4 (renovation finished), in number of dwellings, so it is related to P30, P31, P40 and P41.**

- P50 addresses the conversion rate from stage 4 (renovation finished) to satisfied customers with the result, in number of dwellings, so it is related to P40 and P43.

The data needed to build these KPIs is collected from:

- CRM, each new customer contacts the Citizen Hub, attends a personal meeting or answers a follow-up call (3 months later) or check call (another 3 months later).

- Reno proposals applying for grants, for each building are assessed, every 6 months.

- Exit surveys answered (3 months after check call).

It is reported through the KPIs form, by the office staff profile, or data is imported by IT from the grants' application tool.

Figure 6 - Pipeline data in the KPIs form

So, to be visualized as cards with absolute numbers and percentages and gauges with ranges and objectives:

Figure 7 - Conversion rate from stage 1 to stage 2 representation (P29) and satisfaction level

Also, visualization of stages conversion rates and time spent by citizen Hub on each user per each stage on these parallel histograms helps understand the effort needed by the Citizen Hub to push or follow the renovation works as it advances in the customer journey.
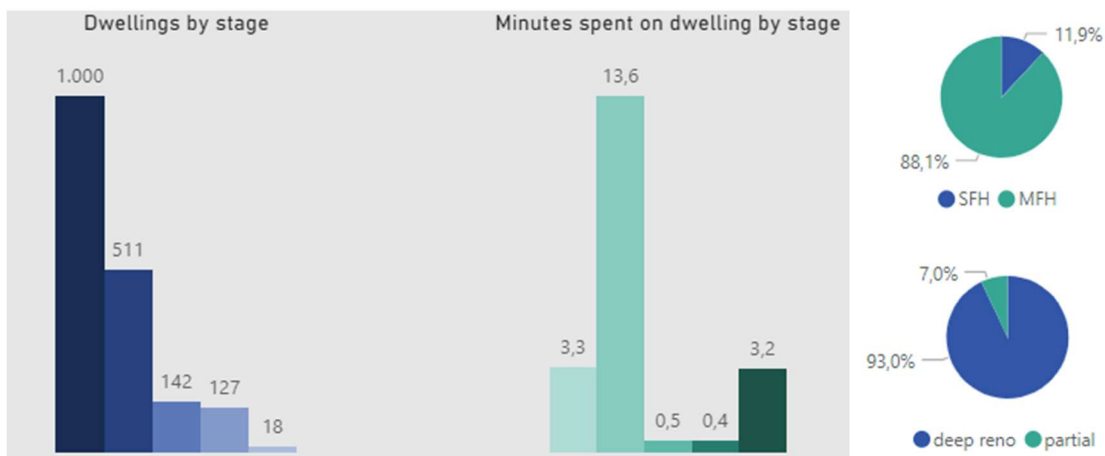
Figure 8 - Users by stage, time and type of dwelling and renovation

Finally, pie charts illustrate the proportions and describe the kind of buildings performing renovations, and the type of renovations.

I – Impact KPIs

Economic, Environmental, and Social KPIs are needed to understand the real impact of the citizen Hub within its environment and help calculate the fulfilment of the final objectives of an OSS. These KPIs include:

Table 14 – Impact KPIs for Valencia pilot

KPI ID	KPI name	Answer by	Answer each...	Answer format
I01	project cost	office staff	customer + 3M	€
I02	subsidies applied	office staff	customer + 3M	€
I10	works cost	office staff	customer + 6M	€
I11	subsidies got	office staff	customer + 6M	€
I12	jobs created	AUTO	6M	int
I20	nrPE savings	office staff	customer + 3M	kWh/m2y
I21	CO2 reduction	office staff	customer + 3M	tCO2eq/m2y
I30	nrPE savings	office staff	customer + 6M	kWh/m2y
I31	CO2 reduction	office staff	customer + 6M	tCO2eq/m2y
I40	testimonies	office staff	customer + 9M	text
I41	IEQ monitoring	office staff	customer + 9M	file
I42	HWB questionnaire	office staff	customer + 9M	file
I50	satifaction process	office staff	customer + 9M	select

- I01 addresses the projected renovation investments triggered by the renovation projects assisted by the Citizen Hub, and is related to P20.

- I02 addresses the potential subsidies to get by the renovation projects assisted by the Citizen Hub, and is related to P23.

- I10 addresses the renovation investments triggered by the renovation works assisted by the Citizen Hub, and is related to P31.

- I11 addresses the subsidies got by the renovation works assisted by the Citizen Hub, and is related to P31.

- I12 addresses the jobs created by the renovation works assisted by the Citizen Hub, based on the assumption that for each million triggered investments in the rehabilitation sector, 18 local jobs are created in Spain, and is related to I10.

- I20 addresses the projected nrPE savings triggered by the renovation projects assisted by the Citizen Hub, and is related to P20.

- I21 addresses the potential CO2 reduction achieved through the renovation projects assisted by the Citizen Hub, and is related to P20.

- I30 addresses the nrPE savings triggered by the renovation works assisted by the Citizen Hub, and is related to P31.

- I31 addresses the CO2 reduction achieved through the renovation works assisted by the Citizen Hub, and is related to P31.

- I40 addresses specific testimonies and/or experiences to highlight and is related to P40.

D4.2 - **Citizen Hub model agreement including quality control system for the business model elements and monitoring protocols for evaluation of partners' activities**

SAVE THE HOMES

- I41 addresses the IEQ monitoring representation, and is related to P40.

- I42 addresses the self-perceived HWB representations, and is related to P40.

- I50 addresses the satisfaction level with the Citizen Hub service.

The data needed to build these KPIs is collected from:

- CRM each customer answering a follow-up call (3 months after personal meeting) or check call (other 3 months later).

- Reno proposals applying for grants, for each building are assessed, every 6 months.

- Exit surveys answered (3 months after check call).

And reported through the questionnaire, mainly by the office staff profile.
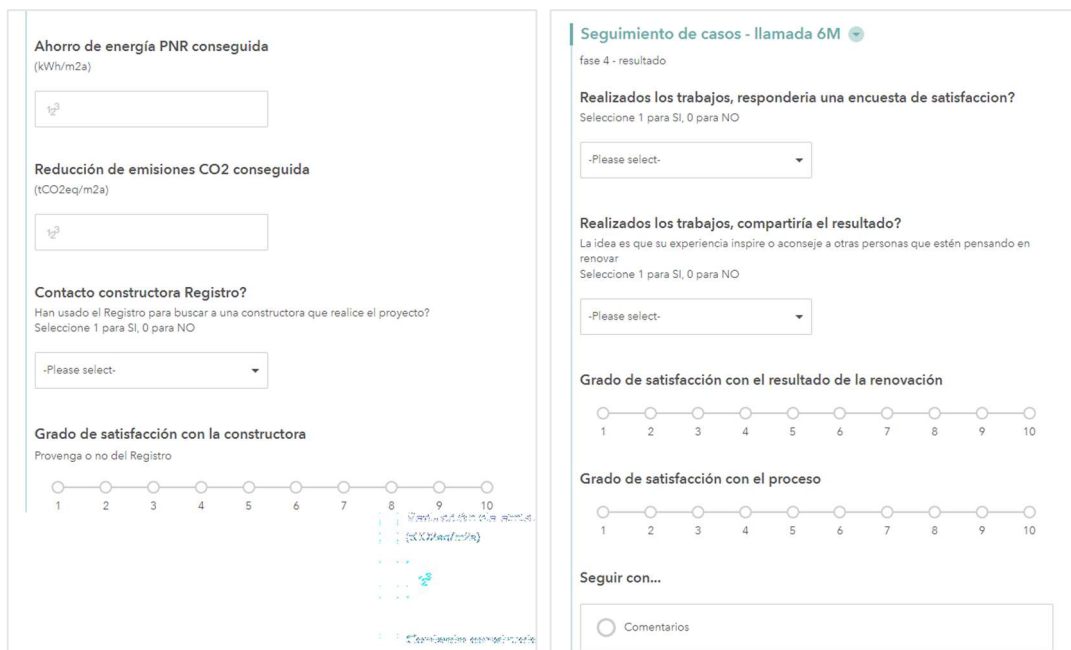
Figure 9 - Impact data in the KPIs form

Therefore, impacts can be visualized as cards and gauges, in order to follow up on the Citizen Hub or OSS program goals achievement:
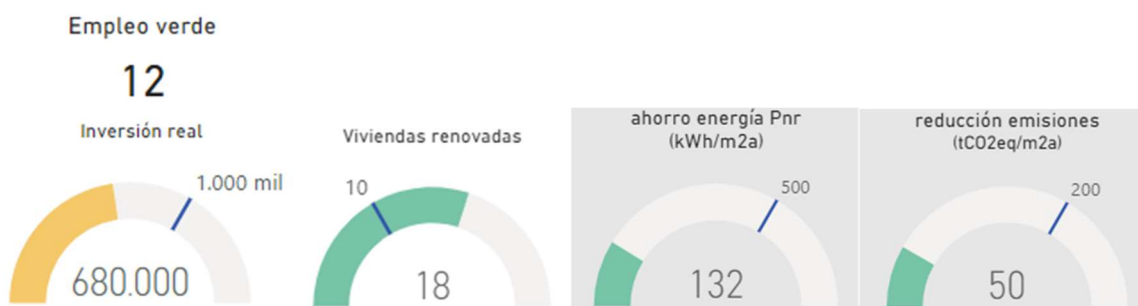
Figure 10 - Impact KPIs visualization

It is very important also to visualize renovation subsidies by renovation projects assisted by the citizen Hub, as pie charts for ratios and gauges, to follow-up objectives achievement.
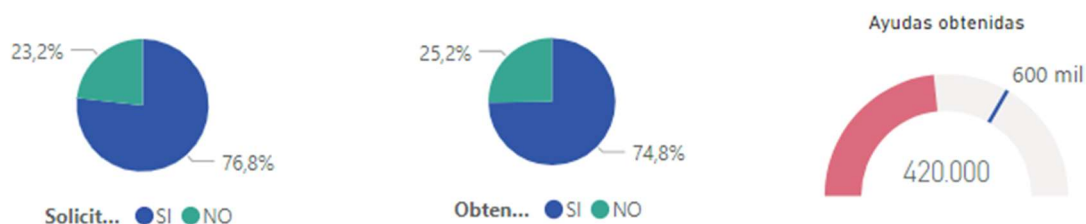
Figure 11 - Subsidies related KPIs

R – Contractors KPIs

Needed for assessing the needed ties with the local construction ecosystem, and include:

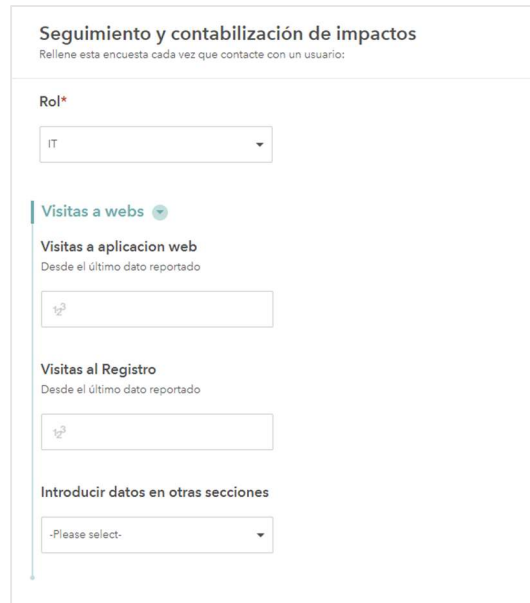**Table 15 – Contractors KPIs for Valencia pilot**

KPI ID	KPI name	Answer by	Answer each...	Answer format
R01	contacts registry	IT	6M	int
R02	professional form registry	AUTO	6M	%
R03	works cost	AUTO	6M	€
R10	satisfaction	AUTO	6M	double

- R01 addresses the activity on the Registries' websites.

- R02 addresses the ratio of renovation works performed by professionals and/or contractors from the official registry and relates the number of renovation works (P20, P30, P40) and the contracts signed with entities in the registry (P21, P32).

- R03 addresses the investments triggered by renovation works which went to entities from the registry and therefore relates costs (I01, I10) and the contracts signed with entities in the registry (P21, P32).

- R10 addresses the level of satisfaction with the professionals and contractors contacted from the registry and is related to P22 and P33.

These data are collected from:

- Reno proposals from diagnosis tools and/or grants applications, each 6 months.

- Exit surveys answered at personal meetings of follow-up calls (3 or 6 months later) – already considered for P-KPIs.

Since some of these data are already collected for P-KPIs, the data needed to complete this section is provided through the questionnaire or imported by the IT profile.

Figure 22 - Contractors' data in the KPIs form

It is then visualized mostly as pie charts, for the ratios of contracts and investments coming from the registry, or as gauges to represent the level of satisfaction with those contracts.
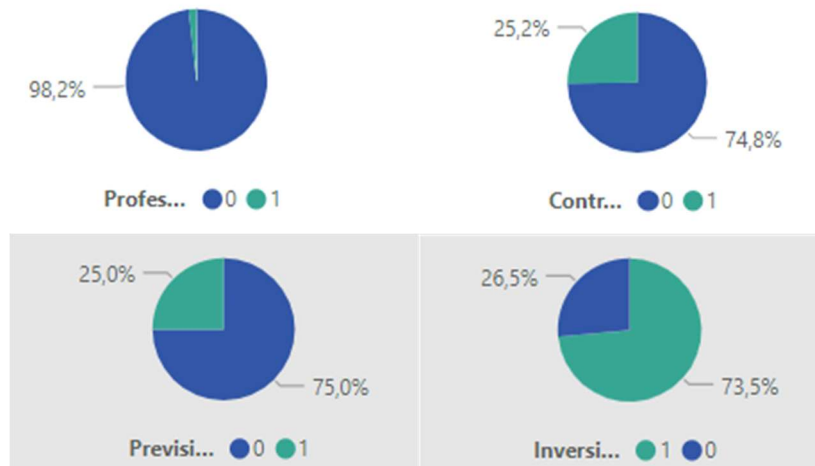

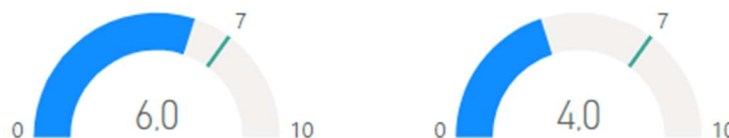*Figure 33 - Validated professionals (R02) and investments triggered by entities from the registry (R03)*

Figure 44 - Satisfaction levels (R10)

Also, interesting how entities from registry capitalize the subsidies, in terms of subsidies got by design and subsidies finally got, showed as pie charts, as a derivation of R03, considering subsidies (I02 and I11) instead of costs (I01 and I10).
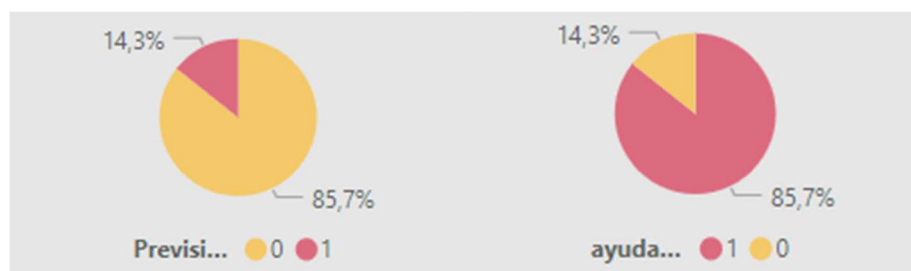
Figure 55 - Ratios of calculated subsidies and renovation works using entities from the registry

O – Objectives

Finally, there is the need to monitor if results advance into the achievement of some objectives. In the case of the project, there are some objectives to achieve according to a GA, but in real life, and after the project completion, Citizen Hub programs will also set periodic objectives. Those, are used together and thus related with the other sections' KPIs, mostly on the gauges' representations in pipeline and impact KPIs, and include:

Table 16 – Objectives for Valencia pilot

O01	dwellings	program resp	12M	int
O02	investments	program resp	12M	€
O03	subsidies	program resp	12M	€
O04	nrPE savings	program resp	12M	kWh/m2y
O05	CO2 reduction	program resp	12M	tCO2eq/m2y
O06	dissemination audience	program resp	12M	int
O07	dissemination type	program resp	12M	select

- O01 sets the number of dwellings to be renovated in the territorial and time scope of the Citizen Hub program and is related to the P-KPIs P03, P12 and P40.

- O02 sets the investments to be triggered by those renovations and is related to the economic I-KPI I10.

- O03 sets the subsidies to be capitalized by those renovations and is related to the economic I-KPI I11.

- O04 sets the nrPE savings to be achieved through O01 renovations and is related to the environmental I-KPI I30.

- O05 sets the CO2 reduction to be achieved through O01 renovations and is related to the environmental I-KPI I31.

- O06 describes the target audience of dissemination actions and is related to P-KPIs.

- O07 describes the dissemination action type or channel, among several options (newsletter; social media; mass media...) and is related to P-KPIs.

These data are not collected but set by the programme responsible profile, who has to report them through the KPIs form:

Figure 66 - Objectives' data in the KPIs form

Most of them are included in the representation of other KPIs as objective values to visualize the Citizen Hub performance in terms of impact:
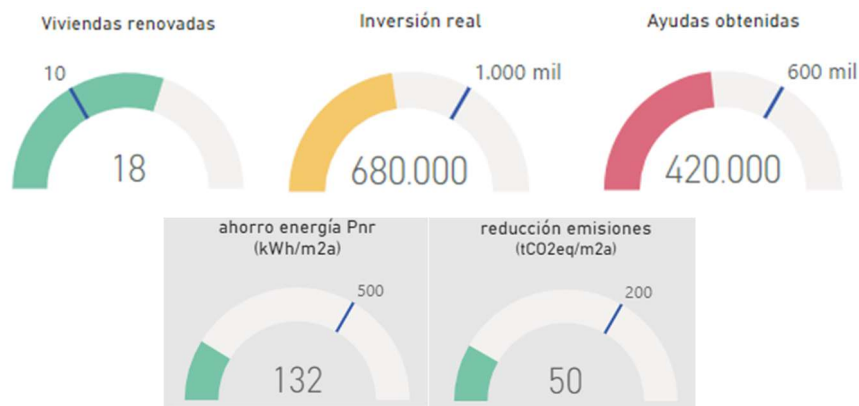

Figure 77 - Monitoring objectives achievement

Others are used as baselines to evaluate the Citizen hub activities efficiency in terms of pipeline, to assess dissemination actions and communication channels, so cards and pie charts are chosen:
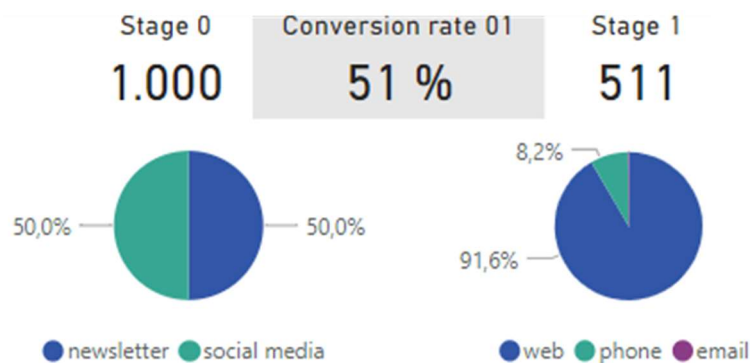

Figure 88 - Channels distribution in stage 0 and stage 1

5 Quality control monitoring

Quality control is essential at each phase of the customer journey. Building on the solution mapping performed in Deliverable 2.4, Citizen Hub managers can choose from multiple evaluation methods depending on their different realities. Appreciation metrics should be gathered after a participant completes every stage.

After the completion of construction works, the exit survey will help Citizen Hub managers assess the quality of their service. The exit survey also serves Citizen Hub managers in the rating of contractors. Their effectiveness and client relations should be monitored.

An energy audit should be performed after the works and the report shared with the Citizen Hub. Timeline and project scope aspects should also be included in the ex-ante assessment. The most useful metric for the Citizen Hub manager is the final cost of each kWh saved. These metrics could help the rollout of future Citizen Hubs development by reducing perceived construction risks.

Table 17 – Rotterdam quality controls protocol (from D2.4)

EU (applicable results)	In-house (partners resources)	local (initiatives)
TripleA-reno	Sensi Sensors	Energy consumption
		Feedback of execution

Sensi sensors were the proposed measuring tool. To get the best results out of this sensor, measures need to be taken before the renovation and after the renovation. That way a baseline was set, and afterwards the improvement could be measured.

In the onboarding phase, we no longer use the Sensi's. The advantage of the Sensi's was that you could create awareness among people about the need to improve their energy consumption. Sending them a Sensi was an opening to inform them of their situation. The changing world circumstances, and especially the war in Ukraine, led to an acceleration in growing awareness for energy efficiency. Not from a sustainability point of view, but the rising prices made people much more aware of their energy consumption. Energy suppliers pointed people more towards their energy consumption apps to show people what they were using (see also WP3). So the level of awareness we created with the Sensi's was reached in another way. The Sensi's were no longer needed to raise awareness. The added value was measuring comfort, but for just that piece of information, people were not willing to participate and the costs for exploiting the sensors were too high.

Table 18 – Valencia quality controls protocols (from D2.4)

EU (applicable results)	In-house (partners resources)	local (initiatives)
SSO	Energy consumption test	Through VCE's users advisory services
TripleA-reno	Self-assessment tool for tourist homes	
DRIVE 0		

- In the case of the Valencia pilot, EU results, in-house resources and local initiatives mapped in D2.4 will be used to ensure/ measure quality **on each stage**: in terms of planned-achieved (design stage) and before-after comparisons (realization stage), a Triple A-reno similar combined labelling for energy, IEQ and wellbeing and monitoring protocol is used to assess pre and post renovation

results (in-use stage), not only for the monitored homes, but also for recommendation to similar dwellings coming to the citizen hub for advice (evaluation stage), and as success stories for onboarding stage.

- For ensuring/monitoring the quality of the **service delivered** through the Citizen Hubs, the T4.6 satisfaction questionnaire will be used, in combination with the already-in-use VCE CRM forms.

- Finally, for the **Citizen Hub concept** quality control, the economic efficiency of the kWh saved by the citizen Hub activities will be used, based on the KPIs data collected for the business model monitoring, considering a combination of S01 OPEX, I10 works costs, and I30 nrPE savings.

$$Economic\ efficiency = \frac{[OPEX\ (S01) + investments\ triggered(I10)]}{nrPE\ savings\ (I30)}$$

6   Conclusions

The Save the Homes project pilots started their journey in the renovation of buildings and homes by establishing quality control systems for their activities and monitoring protocols appropriate to their idiosyncrasies, nature and capacities.

The setting up of these systems and protocols is an exercise that evolves over time, and the presentation of this agreement initiates a phase that allows for their improvement based on the lessons learned and the fundamentals shown here.

The new proposal of presented KPIs does not imply that the pilots are obliged to adopt all of them, although this proposal shows an exhaustive and complete measurement system, the cities of Rotterdam and Valencia will try to adapt the indicators that are not collecting yet as far as possible, being able to differ in the periodicity of their monitoring, in the collection method and in the exact formula for obtaining their outputs.

For replication at the national and European levels:

- A data-driven approach to business model monitoring consists of making decisions and validating hypotheses based on quantitative facts.

- The data collection strategy has to be implemented at the start of the project.

- Underlying KPIs have to be discussed with key partners

- Managers need to use the performance goals set in the business model as a baseline.

- The more relevant KPIs address challenges or suspected bottlenecks.

- Best practice shows that selecting fewer KPIs with a higher update rate is the most efficient monitoring method.

- The frequent reassessment of short-term planned objectives is the best way to validate if decisions from managers are having a positive impact.

- There is a need to measure KPIs not only continuously but also on a project level.