Save the Homes

Project duration: 1st September 2020 – 31st August 2023

Grant Agreement number: 892749 (Coordination and Support Action)

WP: 4 **Deliverable**: D4.5.- Action plan, risk assessment and quality assurance of the renovation activities

Lead beneficiary: BHG

Submission Date: Januar 2024

Dissemination Level: Public

Due date: M12

Revision History:

DATE	VERSION	AUTHOR/CONTRIBUTOR	REVISION BY	COMMENTS
09/06/2021	0.1	Haico van Nunen / BHG		
15/02/2022	0.9	Merle Savelsberg / BHG; Lucía Ramírez / IVE		
22/12/2022	0.91	Merle Savelsberg / BHG		
04/10/2023	0.99	Haico van Nunen / BHG; Álvaro Salamanca / GNE; Ana Sanchis, Lucía Ramírez /IVE; O Oung,/RDM		
04/01/2024	1.0	Haico van Nunen / BHG		Based on comments version 0.99

Table of Content

1 Executive Summary

Introduction

This deliverable has been written and rewritten during the Save the Homes project, and was almost finished for submission by the end of 2022. This deliverable started early in the project, second quarter of 2021, and was worked on until the end of 2022. In the meanwhile we encountered more and more risks and changes in the plan. The planned submittance of the deliverable in the winter of 2022 (with a planned update at the end of the project) was postponed, wanting to add the elaborated journey and do it all at once. This also contributes to an extensive deliverable, with a lot of references to other deliverables' continuously was a way to document findings.

It started as a descriptions and development of the HUB. Based on the boundaries of what a HUB should offer and how it should look like. During the project circumstances changed. But also the market turned out to be not as ready for a single place to act as a One Stop Shop. Therefore the aim of the project changed to create circumstances under which a platform (digital or physical) could function. That is why we decided not to submit at the due date, but directly adapt it towards the end of the project.

In this deliverable, focus goes out to the Action plan, risk assessment and quality assurance of the renovation activities. Actual renovations are scarce, but the overall process has been documented in all its width. This report is the first step of the demonstration case (T4.4) and elaborates on what all stakeholders see as the function of a HUB. During the start-up of the demonstration project in Rotterdam, we encountered different point of views with different partners. In the Valencia cases this was also the situation. That is why we took the effort to describe the position of all partners. We did that in 1-1 interviews, and we used the technical Workshop on June 3rd 2021 (session 2) to extend these opinions. During consortium meeting 4 (San Cugat) we presented the outcome of this opinion. Based on the input of alle partners an overview of possible risks, barriers and qualities is mapped. This deliverable aims at a description of the **Action plan, risk assessment and quality assurance of the renovation activities.**

The **WP4** objective is about the citizen Hub demonstration. The project goes beyond designing the best fit HUB, it also aims at actually implement the HUB and make a blueprint for future HUB's. That is why next to Rotterdam and Valencia there are also follower cities in the entity of Sant Sugat municipality and the city of Ljubljana and umbrella organisations like UIPI and ICLEI.

Content

Because there are different approaches towards definitions on renovation, the role of the government and how a HUB should look like, chapter 2 of goes into detail on roles. Here the paper written by Milin and Bullier is used as a guideline. Especially the role of the government is discussed, on the current level and based on future developments, for example an open government. The input from different workshops and consortium meetings were used. To back this all up, several interviews were conducted. This resulted in a definition for the functionality of a HUB:

> A HUB is trustworthy place, where citizens can get information, in a digital or physical way, to get acquainted with (sustainable) renovation, the measures, the finance and the impact it has on living. Besides information, it functions as a gateway towards contractors, suppliers and intermediates, so that individual homeowners can actual make the step towards execution.

The next step was how to bring this approach of a One Stop Shop to the market. In Work Package 2 supply and demand already have been mapped, but what instruments are needed to set up a functioning HUB? In chapter 4 and Annex 3, all aspects of an integral renovation are looked upon. Based on one figure of Integral Renovation (figure 13) existing channels are gathered for both pilot city's and newly needed channels are mentioned by all consortium members. This sets the boundaries for a One Stop Shop or HUB in general, regardless the place or country.

In chapter 5 and 6 we make the step towards the pilot cities. For both, Valencia and Rotterdam the way it is organised is describes, the risks and roles are mentioned (based on the results of chapter 2) and finally risk on quality, control and scale-up labour and execution are described. Chapter 6 goes into detail how each of the pilot cities goes to market and what is used to do so. This chapter is ended with different kinds of upscaling.

Because this deliverable concentrates on risk and how to avoid them, the Save the Homes customer journey is described. This customer journey which consists of twenty steps, acts as a guideline through the whole process. Each of these steps is elaborated on, giving an insight on the actions that are needed (also gathered in Annex 4), the roles, the risks and opportunities that arise.

Chapter 8 gives conclusions on the whole process of setting up the OSS in both pilot cities, Valencia and Rotterdam. These conclusions are:

Valencia:

1) Energy renovation is not the priority for homeowners or occupants. Therefore, **including conservation, aesthetic or accessibility renovation works in the grant schemes is capital** to attract citizens to energy renovations
2) Presenting a small set of conclusions with their cost and potential benefits, in a **early stage** of the journey is needed
3) The role of the **staff** in the Hubs is of key importance (**human interaction)**, they gain the **trust** of citizens. Promoting **peer-to-peer exchanges and collective activities** among homeowners that want to renovate has proven to be very impactful.
4) Driving citizens to **certified professionals** is a good idea, but some work is still needed when renovation works are not big enough for interesting 'big' companies. **Smaller** companies or local craftsmen registries would help.
5) **Monitoring campaigns** are hard to plan and perform, but really appeal citizens and reassure owners.
6) **Decision-making processes in multi-family buildings** are still slow, complex and uncertain. Even when highly attractive public subsidies exist, getting consensus in medium and big buildings is difficult.
7) The **free-based service** is costly for the HUB, which depends on the public budget for each year, and makes service delivery **uneven in the different municipalities, depending on their capacity to capitalize other source of financing**,

Rotterdam:

1) The organisation that is in place to help citizens as well as contractors **does not exist** as an entity. And no one is willing to take the risk for it to fulfil that role.
2) No one is willing to **put up money upfront**, to form an entity that will enable a OSS. That explains why people think it is a good idea, but **nobody wants to participate** and take a risk.
3) There are **several risks** (overall economy and availability of materials) involved in setting up a successful HUB that can be found on different locations.

4) It is important as a HUB to offer stable and reliable solutions for renovations that ensure a certain level of **quality**, in agreement with what the homeowners had in mind. Therefore, the start of the HUB must **be good at once**.

5) Because of the lack of labour we were not able to guarantee renovations. Rather than just promote renovation with citizens, we tried to look for **solutions on more people** for the execution of work, but this lies without the scope of the consortium.

6) The energy community needs to look at it as **a continuous stream of renovations** and not just a project of 10 homes. But that needs guarantees that the energy community cannot provide.

7) When the first idea of Save the Homes was pitched to municipalities it was about **lack of money** and **lack of labour**. In Rotterdam, with the **ETF loan**, the problem of people not being able to pay for a renovation did become much smaller. The problem about **labour** still has not been solved and is even getting bigger.

2 Roles in the customer journey

Deliverable D3.1 (Save the homes home renovation customer journey methodology and elaboration for the two pilots) describes the steps necessary for a customer journey. Based on the results of WP2, as well as the supply side as the demand side, the necessary steps to come from a rough idea towards, offer, execution and monitoring of the whole process is a complete journey. The members of the consortium are well aware of this complete journey, however, the average citizen does not. So, we have to help him/her to go across this journey, and in the meanwhile make it not look like a journey or an effort. To make it difficult al lot of parties that are involved in this journey are also not aware of the complete journey. There learning and extra schooling is needed to make them understand the whole scope of sustainable renovation.

2.1 Defining steps

The customer journey of a citizen knows several steps. In WP 3.1 and Milestone 3 this is already discussed. That part of the customer journey starts with onboarding, and goes via design, elaboration and construction into the use phase. For the first part of the journey, from a marketing perspective, there are more steps to be taken. Citizens do not come out of the blue towards the onboarding phase. Something has to **trigger** them towards that point, they have to be aware of the need to do something about sustainable renovation and know where to go. This functionality could be provided by a HUB. That means that a very important step in the total approach, even before the customer journey of Save the Homes can start, is about awareness. This can be explained by the steps based on the hierarchy-of-effects theory[1], a strategy companies use if they expect consumers to need a longer decision-making process, such is the case with renovation.
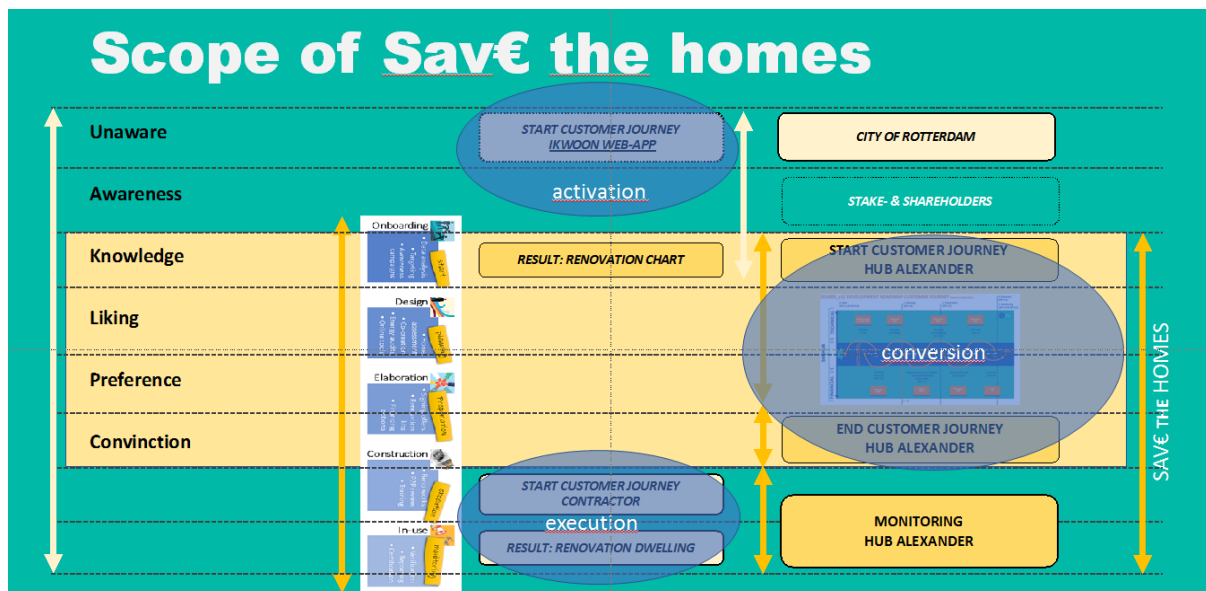
Figure 1.- Scope of Save the Homes

Hierarchy-of-effects theory (HOET)

This theory discerns several steps people have to go through before they come into action, in the case of product marketing, buy the product. People get in this phase on different levels. The Save the Homes proposal stars with onboarding, but **more steps are needed**. Figure 1 shows the phases of the HOET, together with the steps of the proposal. There are three distinct activities in the overall project, activation, conversion and execution. Based on the HOET we can discern:

- *Unawareness*: the citizen does not know that he/she has a renovation task
- *Awareness*: the citizen knows he/she has to do something and perhaps has a vague idea what kind of solution is needed.
- *Knowledge*: the citizen has more information about the topic but has not yet chosen for a specific way to go. This is typically the start of the HUB as described in the customer journey.
- *Liking*: of all the available solutions and choices the citizen can make, one or two prevail. It is most likely that they will choose from these options.
- *Preference*: the citizen makes a choice for a certain solution and makes all in compliance with the wishes and demands.
- *Conviction*: is about sealing the deal and coming to actual action.

The HOET shows that more needs to be done to get people on aware before they can go to the onboarding phase. During the (online-data) consortium (03-06-2021) meeting we asked all consortium members to look at their role, in respect to the HOET classes.

We have done this exercise with the partners of our consortium. They were asked to put their organisation in the spot they thought their role lies. In the figure below the necessary marketing step of the hierarchy of effect strategy are mentioned on the horizontal axis, and each consortium partner was asked to put the bars into place like a Gant chart.
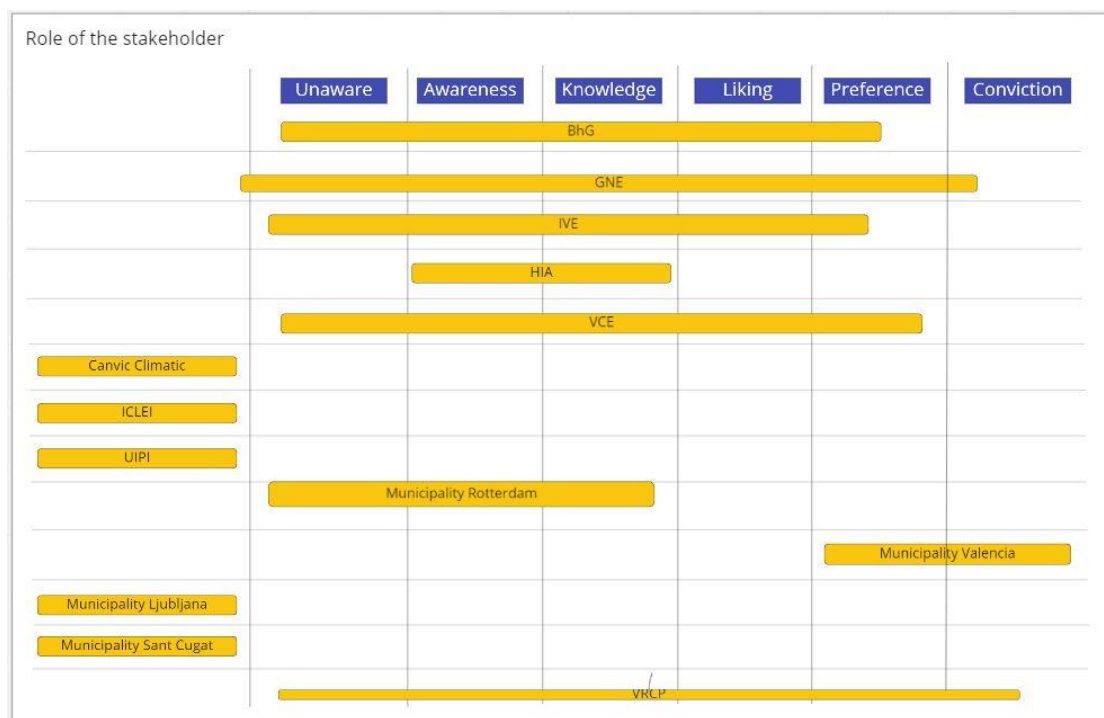
Figure 2: Roles of the consortium partners in the process

Findings with figure 2:

HIA puts their role with the starting point in Awareness. That is according to the customer journey and the starting point of onboarding as mentioned in the proposal.

Other parties like IVE, VCE and BHG cover the whole trajectory, but stop at preference.

GNE goes even beyond that point and think they can add their services throughout the whole process. Especially for the financial aspects this is, in fact, the case. VRCP also covers the whole process.

The largest difference lies between the two municipalities. Whereas Rotterdam gives focus to creating awareness, the municipality of Valencia is more involved in the last steps. VCE explains that in practice VCE is (on behalf of the municipality of Valencia) the party that brings people from unaware towards making a choice. When people have made a choice the municipality is mainly involved in permits and regulations and so on. This is an important difference also in comparison to the choice for models of One Stop Shop, introduced by Milin (see 2.4).

2.2   Role of the government

The government has a focus on energy efficiency and reaching the climate agreement. The way these goals will be reached is diffuse. For example, in the Valencia Region the energy office is used to **inform** their people and provide them with information. The energy office is staffed by the municipality. In Rotterdam, the municipality does not have an energy office but has had several initiatives to **reach out to** citizens. For example, a pop-up shop, an actual store with solutions but also energy coaches and energy handymen that come to people at home. These are all small-scaled initiatives and not spread over the complete city, but all contribute to the overall goal of a sustainable 2050. For the municipality it is about looking what will work, and what not. In deliverable D4.10 an extensive list is made of **tools and initiatives** that have been used during the Save the Homes trajectory.

Another point that emerged during the definition of the functionality of the HUB is to what extent does the influence of the municipality go? The first question that arises is whether the municipality has a role in the HUB at all? Then the next question arises what functionality the HUB has (this will be discussed in chapter 3.3), but also, the question arises how far in the process does the HUB operate? For example, in the phases of preference and conviction and even further (in the customer journey we are then talking about execution and in-use) there are market parties in place. Is that part of the customer journey still under control by the HUB? And most of all who staffs the HUB?

For Rotterdam, this poses as a problem, because a local government cannot give an advantage towards one party without organising a proper tender. Therefore direct involvement of the municipality should be restricted to the level of knowledge (step onboarding and part of design), and the role is that of advice. Support leans already more towards actual solutions (and gain for a citizen) so this is not the desired path for the municipality.

Valencia has a list of several contractors. The energy office gives people the list, but does not advise one or the other, so people are making the choice themselves. In that case, it is difficult to determine who to put on the list, and to determine on how you keep control of the level of quality that is on the list. Especially because the list of possible contractors is maintained by the government, so all contractors should be allowed. Ideally you would provide a list with certified or labelled contactors, to ensure quality. Now citizens have to make their own consideration whether a contractor will deliver as promised.

To address the position and role of the government, we asked partners to use the process scale (unaware-conviction) to describe this role of the government.
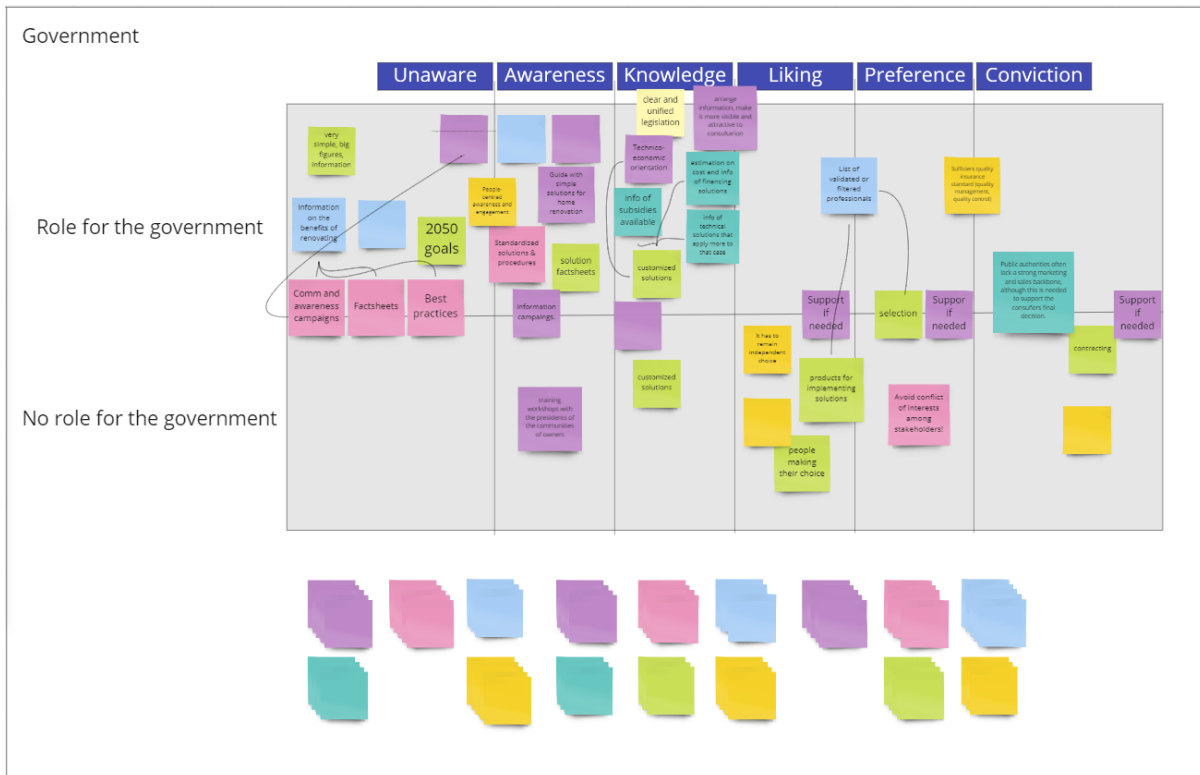
Figure 3: role of the government

Findings with figure 3:

The municipality has a role in the start-up of the HUB.

The tipping point in the process lies between knowledge and liking. To say it in another way, the municipality see it as a task to inform people. But the process of turning interest (activation) into action is not a role for the government.

The problem for the HUB is that it is a place where demand and supply come together. And it seems that the demand side is a side where the government is expected to take a role, at least by citizens. But at the supply side the role of the government is not present. So in order to create a functional HUB the roles need to be clear. And if the government is not taking a role on the market side, who will?

In the unaware phase there is a need for attention for sustainability and what the role of the citizens is. It is about the 2050 goals and very simple information based on big figures. Towards awareness, there is a need for more detailed information. For example, standardised solutions and factsheets about these solutions. At the start of this project public awareness was at a rather low level. During the project the worldwide context changed, with a war in Ukraine and energy prices and raw materials increasing. That gave a boost to the awareness of energy efficiency with citizens. But not directly turning into knowledge.

In the knowledge phase it is not as much about the technical possibilities, but about the financial and even legal difficulties. As described, most consortium partners see the governmental influence go back, and the influence of the market increase. However, this step is about making independent choices, but the contractors need validation of a continuous market. The influence of quality control and insurance arises, which in origin is a task for the government.

In the conviction path it is mentioned that the government lacks a sale back bone, but that such place is needed to convince people to go further. The demand asks for an organisational place. In another study by Klimaatverbond en BouwhulpGroep an alternative for this organisation is formed.[2]

Overall, a conclusion often heard in the interviews, is that because the government is somehow involved in de HUB, it displays a certain form of independency, that is needed. Because that commitment of the government it must be good, but on the other hand the focus of the government lies at the first half.

2.3 Investment
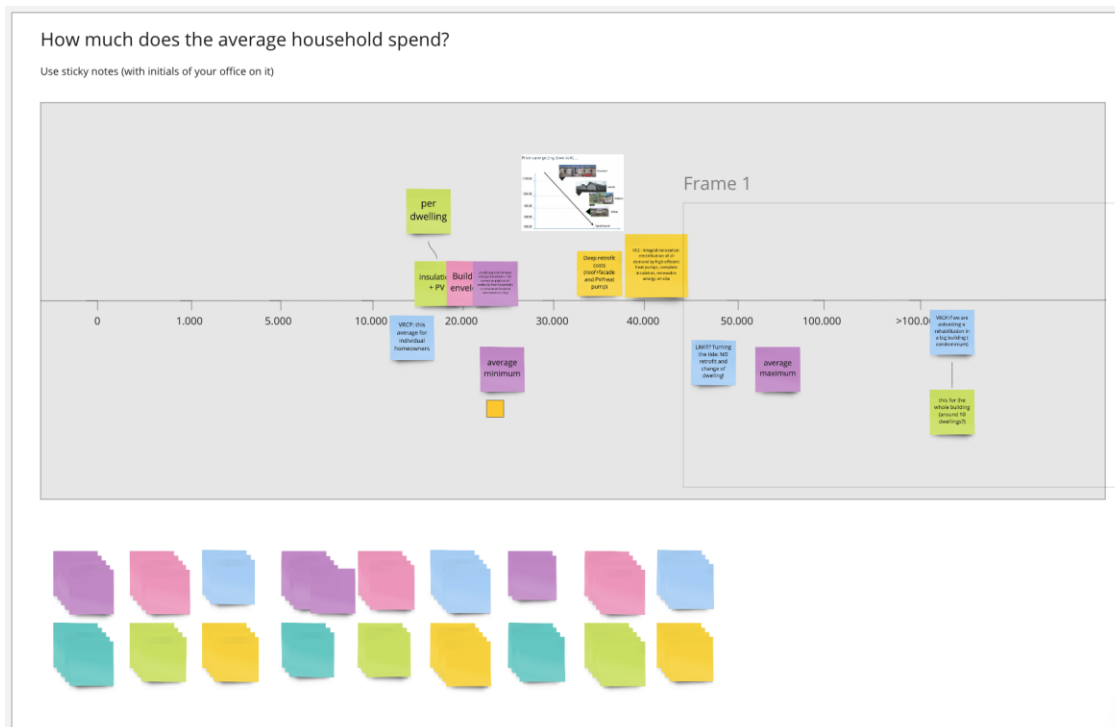
Figure 4: Investment needed for solutions

Home improvement and sustainability have high costs. But we see different prices. Discussions sometimes have new glazing as a **reference**, and sometimes people mean a complete deep renovation. Therefore, we asked each partner to fill in an estimate of the amount needed for a deep renovation that fits the 2050 ambition of the EU. The outcome varies between about 15.000 euro and about 75.000 euro. Even higher numbers were mentioned when renovating a whole building (complex). When the measures are restricted to insulation and PV panels, it should be possible for about 20.000 euro. A difference can be seen between the Netherlands and Spain, but this can be brought back to differences based on the climate conditions. In both cases, the amount needed for the investment is **more than 25.000 euro.** That is an amount that most people do not have, so in both countries (new) financial financing schemes are needed to make the desired options accessible for

---

[2]Whitepaper 'From climate agreement to kitchen table' https://klimaatverbond.nl/actueel/whitepaper-van-klimaatakkoord-naar-keukentafel/ which indicates solutions to develop an entity or organisation (energy service organisation) that fulfils the role similar to a HUB (in Dutch).

people. A graph was added by one of the consortium partners about the diminishing cost of deep retrofits in the Netherlands. This does not go as fast as expected, and the needed upscaling has not yet emerged. There are several theories about diminishing renovation costs, when a large enough number of houses is reached, but until now this has not been the case. It occurs more often that the cost reduction that is reached goes into other mandatory measures for the building. During the StH project building costs increased with almost 20%. So even if there were cost reductions, these would disappear based on the rising costs[3].

It is good to keep in mind that the Spanish market in most cases have to deal with **condominiums**, so finance is not only on a personal level, but also how to finance the improvement of a whole building. The same typology (Vereniging van Eigenaren / society of property owners) occurs in the Netherlands, but only for less than 20% of the building stock. In cities, like Rotterdam, the percentage will be higher.

2.4   One Stop Shops (OSS)

The basic principle of Save the Homes is to provide aid to people that want to renovate their home. Save the Homes is not unique with that, there are more initiatives that aim at developing integrated service offers for the energy renovation of private housing. In a summer study Christophe Milin and Adrien Bullier, both member of European Climate, Infrastructure and Environment Executive Agency European Commission, wrote a paper[4] on **Integrated Home Renovation Services**. First they describe 10 steps of the customer journey that a citizen has to go through to do a renovation, from gathering information till execution and follow up.

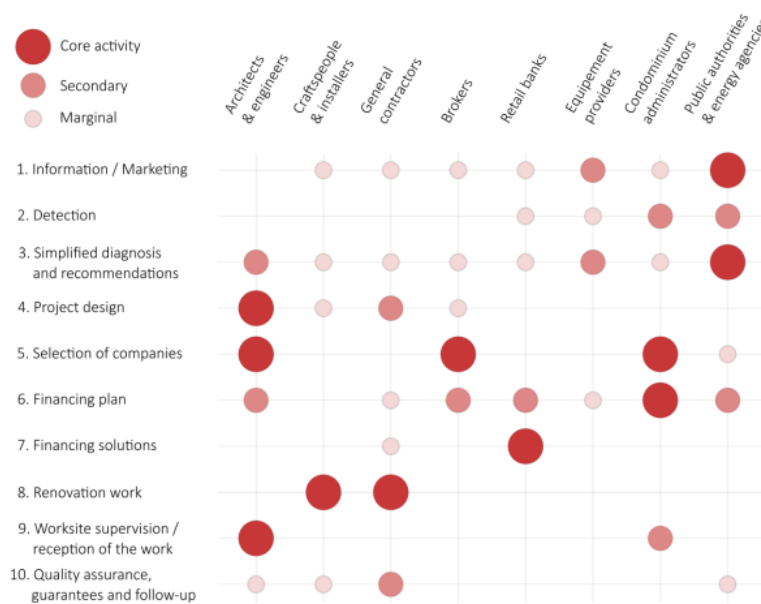Figure 1: Current market offer along the customer journey for home energy renovation

Figure 5: Current market parties that fulfil a (part) of the renovation job, divided in 10 steps.

---

[3] CBS, price index total building costs were in January 2020 156,9, and in November 2023 188,1. This means an increase of 19,9%.
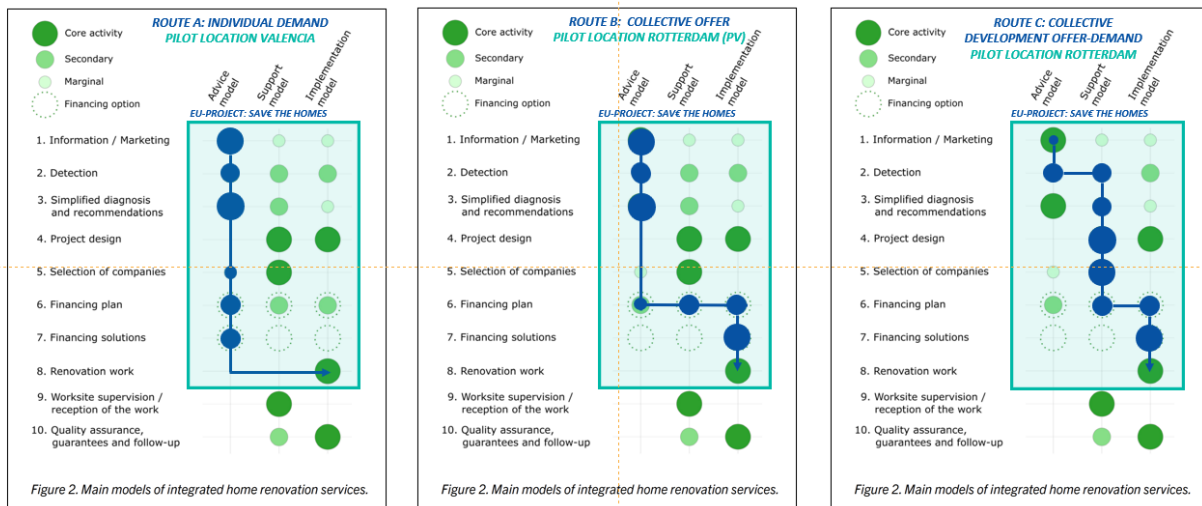[4] Milin C., Bullier A. Towards large-scale roll out of "integrated home renovation services" in Europe.

Based on the 10 steps, and tipping points they see, they bring IHRS back to three **main models**, the advice model, the support model and the implementation model. Each of the models having its own strategic purpose. The Advice model focusses on giving general information and staying away from the actual project or home. The Support model goes further and touches the (individual) project. This also means that some contracts and agreements are needed. The last model, Implementation, takes responsibility, for example by carrying out the work.

In their conclusions they make clear that it is difficult for one entity to perform **all the functionalities**, although Save the Homes in the early stages was aiming for an overall solution. Next to that they discuss the **level of renovation**, where support and implementation tend towards integrated energy renovation solutions, and advice for just sole measures. This calls for a **choice in strategy** which model suits best to the plans and ambition of the municipality. But at the same time it depends on the needed **investment**, as well as for the municipality (organisation) as for the citizens that need to invest in their home. And to be a trustworthy entity, public authorities need to gain and hold the homeowners'' trust. The most important conclusion is that there is not just one solution. The **context** of the local situation depicts what will work and what won't work.

With this paper in mind, we look at the Save the Homes project and see the different approaches of Rotterdam and Valencia. In Green the effect in each step is shown. The circles in blue show three different routes, that can be used, for example a top-down approach like Valencia (left), a bottom up approach with collective purchase, like Rotterdam (middle), and a bottom up approach with an integral approach like Rotterdam (right). In all three cases Save the homes aims at aspect 1-8, where renovation and execution are not part of this IHRS concept. Each of these three routes shifts at a certain moment from an advice model, to a support model or a Implementation model. However these shifts ask for other disciplines within the IRHS, and as Milin and Bullier already mentioned, this cannot be operated by one entity.

Bron:Towards large-scale roll out of "integrated home renovation services" in Europe by Christophe Milin, Belgium and Adrien Bullier, European Climate, infrastructure and Environment Executive Agency, European Commission, 2021 (https://www.eceee.org/library/conference_proceedings/eceee_Summer_Studies/2021/7-policies-for-a-green-recovery-in-the-buildings-sector/towards-large-scale-roll-out-of-integrated-home-renovation-services-in-europe/)

Figure 6 IHRS model by Milin and Bullier, made explicit for Valencia and Rotterdam in Save the Homes

2.5   Functionalities of the Save the Homes HUB

in paragraph 2.4 the HUB and OSS in general are described, but all based on knowledge in 2021. That was after the Save the Homes plan was submitted. For the consortium partners it was still a journey to find out what the functionality of a Save the Home Hub should bring. This was part of our research.

The role of the HUB is to bring **demand and supply together**, in order to stimulate the sustainable renovation. A one stop shop (OSS), that allows citizens to search for the best solution in place. Since the start of the project, the HUB always has been seen as a place where ' all activities' come together. But each partner has its own perspective how the HUB should function. This is partly because the HUB consists of elements that are already in place. For example, in Valencia the energy office has physical places where people can ask questions about their home, and bills. And Rotterdam has experience with setting up a pop-up store to attract people in busy places to tell them about (the possibilities of) their home. Also from other partners like GNE and BHG there is knowledge of more digital ways to reach out to people.

Therefore partners were asked to fill in the functionalities that the HUB should have and if that would be a physical functionality or a digital functionality.
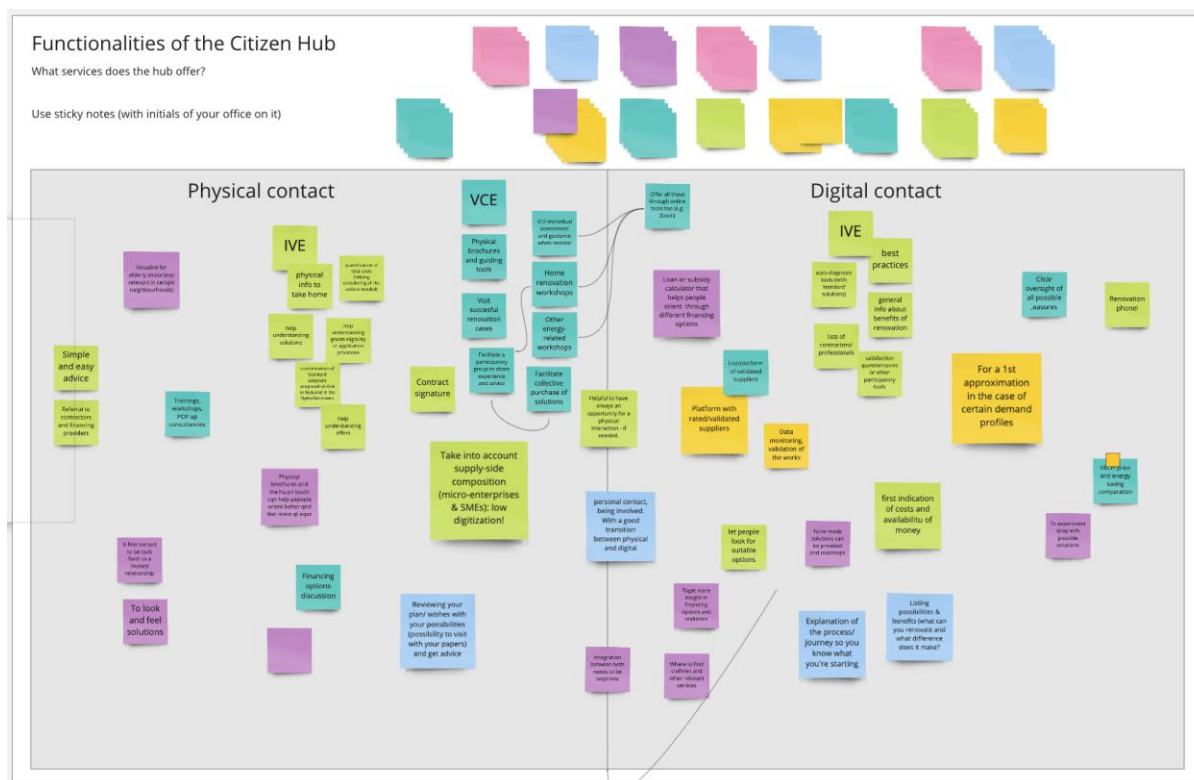
Figure 7: sort of contact needed for the HUB (figure 8 and 9 are larger images of figure 7)

Findings with figure 7:

There are roughly as many reasons for a digital HUB as for a physical HUB. The main advantage of physical places is the visibility towards the city, the personal attention that can be given and the professionality that an actual office has. On the other hand, digital information and digital access allows for a larger reach, with lesser people. Also new means can be used to inform people, like instruction video's, library of examples or reviews by other citizens, just like holiday websites.

The physical part of the HUB should focus on establishing trust and giving actual (specific) information (see also chapter 3: interviews). That can be reached via a talk with an advisor, but also by being able

to see, feel and touch solutions. There are also partners where the first contact preferably is a physical contact, so people feel welcome and understood. In the Rotterdam case, that is why Alex Energie is a local initiative that has a low threshold when it comes to reaching out. There the focus lies at information. However, there are also partners that see the best added value of a **physical** HUB by reviewing plans and/or offers and making draft plans better. Then the HUB is a place for advice, but also a place to be used further on in the customer journey. This implies that people can come to the HUB on several occasions. It also is in line with the three different approaches in the paper by Milin, as discussed in 2.4(advice/support/implementation). It is a first time to get real information and a general overview of what the possibilities are. After that, when they are better informed and are in the steps of 'liking' or even 'preference' they can come back to discuss the offer or get an approval that it is a just solution. In Spain this repetitive use is not yet the case. On a profession level, the physical HUB also provides a place for training of (staff) members who live in the neighbourhood, so they can spread information in these neighbourhoods where the renovations take place. The office Energeia is offering this service as well.

The **digital** part of the HUB can provide information. This can be the same information as people can get in the physical shop, but this information can be made accessible through digital channels. The digital HUB can be the first point of contact for people that want to renovate, so that they can look around for solutions. They can find solutions that are fit for their own homes and a connection can be made with suppliers. Online can also be a place where previous successful renovation projects can be shown, in order to inspire people to do the same renovations in their homes. The digital HUB can be supported by tools that show information on loans, subsidies or tools that show fitted solutions for a home. This can also be an existing tool of a link towards it. The app **Ikwoon** (www.ikwoon.io) is an example of a digital HUB (see introduction video at https://ikwoon-app.falkor.alcor.cloud/) . A combination of the physical and digital HUB could be is the 'Renovation Phone' in analogy of the ' Tax Phone' in the Netherlands, where people can call an expert with the tax authorities, when filling in your tax form. In this case it could be a number that people can call to get a video chat when they get stuck.

Figure 8 Ikwoon is a form of a digital HUB, that allows people as a first discovery of renovation solutions that fit with their home and wishes.

For more information, read deliverable 3.7 as that deliverable goes in-dept into the functionalities of the HUB.
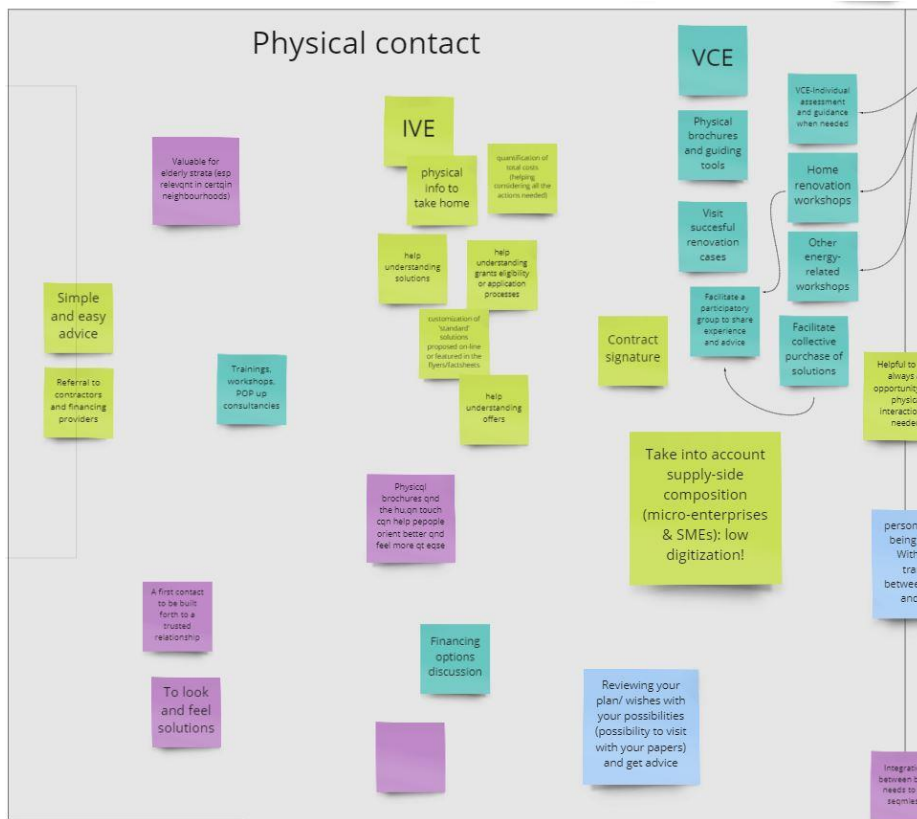
Figure 9: physical contact
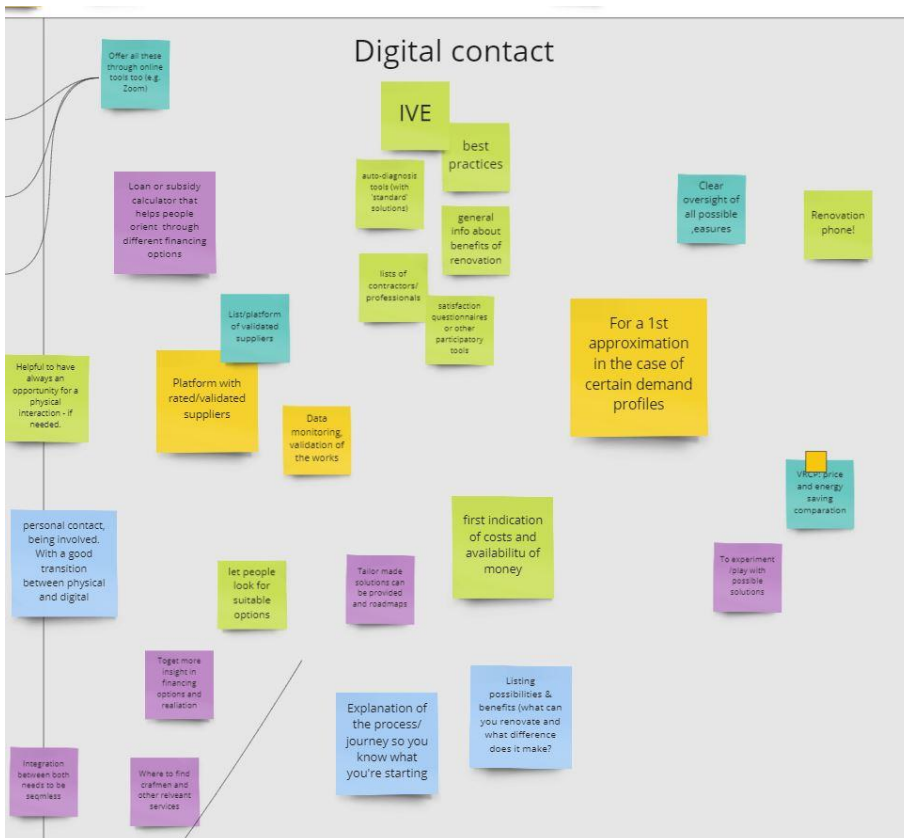
Figure 10: digital contact

2.6 Measures of the citizen HUB

Renovation is about making changes to your home. Some of these measures are instigated by maintenance, others by the wish for more space, a larger kitchen, or the need for a new window. But these measures cover a wide spread of detail, ranging from a **product**, via a **component** and ending with the **whole building** or condominium. When people are talking about renovating, they usually start with the whole building, but when it comes to be precise and doing actual measures they stop at the level of a component or even a product. For example, people are talking about upgrading their building, or getting a specific label, but when they are looking for measures they focus at the facade. In the end they will buy new window frames or just insulated glass. The goals for 2050 are rather high, and therefore measures that will be taken need to be as best as possible in compliance with these goals. That means that it is not just about replacement of glass, but the whole façade; insulation, windows, doors, and ventilation system. In D2.5 (Renovation packages) the approach of Component Renovation is explained. Part of the job of the HUB is to inform people of the necessity of high level measures.
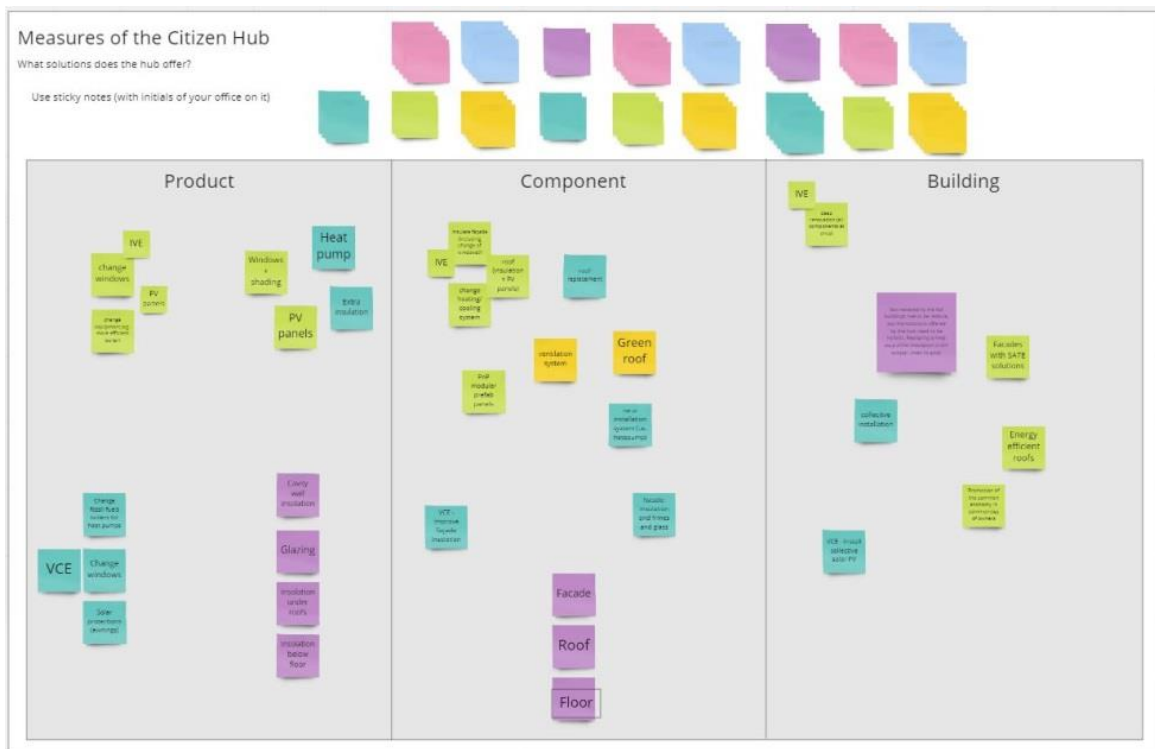
Figure 11: types of measures

Findings with figure 11:

The execution level of the measures depend on the focus of the customer/citizen, but also on the available budget. The functionality of the HUB differs when all solutions are product based or when all solutions are building based. When asking partners to fill in the kind of solutions they had in mind for the HUB, several were mentioned:

- *Heat pump*
- *Changing windows*
- *Shade / awnings*

- *Insulation (roof /façade / floor)*
- *Cavity wall insulation*
- *Installation (boiler)*
- *PV panels*

As can be seen, the solutions are based on a product level, and fit the workflow of maintenance. The work can be done by a small contractor or installation firm. When we look at the component level other measures emerge. A component can be described as a set of product measures that, when put together, fulfil a function. Then the measures are:

- *Complete façade insulation (including windows)*
- *Roof insulation with PV panels*
- *Heating system*
- *Complete roof replacement*
- *PnP modular prefab façade*
- *Ventilation system*
- *Green roof*
- *Floor*

In the end a complete building can be renovated. In that case we usually speak in terms of ambitions for the complete building. For example:

- *Deep renovation*
- *Net-zero renovation*
- *Holistic renovation approach of the complete building*
- *Collective installations*
- *Collective solar*
- *Energy efficient roofs*
- *SATE insulation of facades*

This gives an overview of the level at which the solutions will be offered. In the HUB all three levels can be made available.

The complete overview of building solutions paints a picture of how a building can look like. But unfortunately, the costs of such an intervention are often rather high. This means that these solutions are only possible with the right financing solution with a monthly rate that is do-able for people. The quality added is quality for a long time: 40 or even 50 years. The financial construction has a **shorter span**. Depending on the financial product (i.e. loan or mortgage) the duration is 10 or 15 years, sometimes up to 30. So this makes it difficult to bring complete building solutions into a market for upscaling, because the monthly term would be too high. Financing an intervention that will last 40 years, but only being able to pay for it in 15 years will cause **high monthly rates**. Component based renovation (see deliverable 3.7) tries to incorporate the best of both worlds. High ambitions (by replacing a complete component rather than one product) with a life span that can be overseen (and thus financing within 25 years is possible). However, these components are not always available, and if they are available, it is usually for new built houses rather than renovation. Therefore, the mapping of the supply side (see deliverable 2.5) is of importance.

2.7 Measures and additional parts

We also asked each partner to select four solutions that they thought that could be provided in the HUB, as an indicator/benchmark for what the **supply side should offer**. For each of these solutions we asked what the added value of the HUB should be, based on a three star level. The four items we asked were:

- How much information do you need?
- Do you need technical advice?
- Do you need financial advice?
- How important is execution / aftercare.

It was the presumption that there will be a difference between solutions, based on the level of the solution (product-component-building) but also between solutions. The exercise was done in a workshop (03-06-2021), with results shown in the figure below.
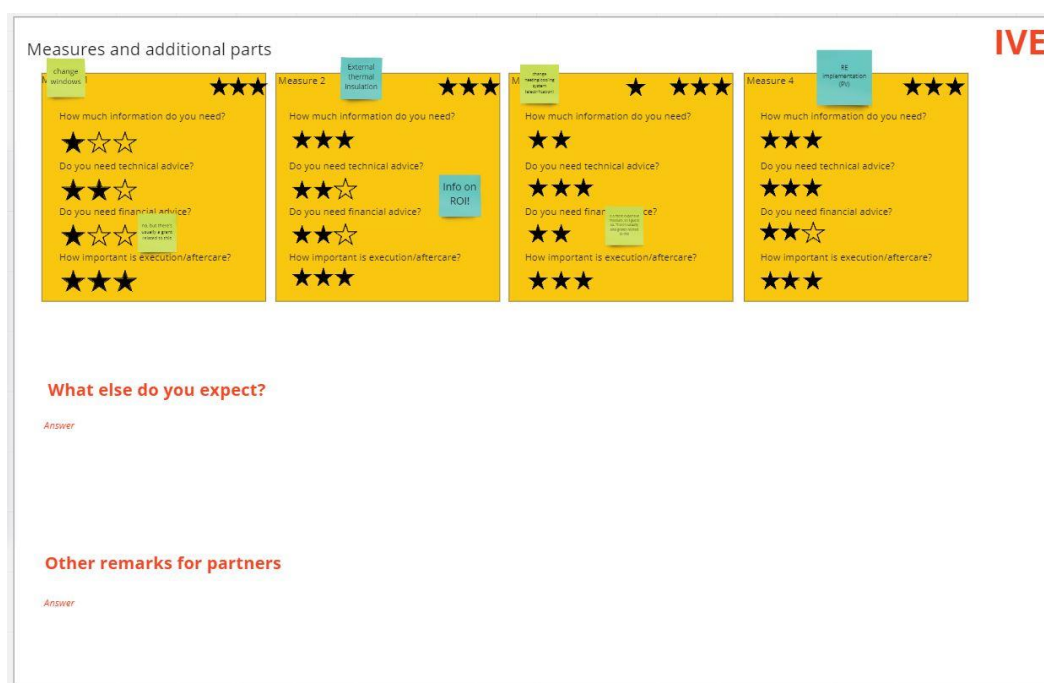
Figure 12: measures explained by IVE, see annex 2 for all results

Findings with figure 12 (and also elaborated in annex 2):

The outcome of this figure varies a lot because different solutions are chosen. As well on a product level as an on component level. The category that scores highest is the execution and after care. This gets often a three star ranking. Also technical advice scores high. The amount of advice fluctuates, but that is because of the differences in measures. The demand for financial advice is present, but more on a two star level.

3   Interviews

Save the Homes creates innovative 'integrated home renovation services' (IHRS). The intention is to do so by creating a 'HUB' where people can find information about sustainable renovation. But what does a HUB exactly do, and what does it offer?

According to Objective 1 of the proposal (to make home renovation easier, faster and more affordable for homeowners by designing an economically sustainable citizen-oriented OSS model, 'Citizen Hub', to be deployed by municipalities), the 'Citizen Hub' can be an One-Stop-Shop (OSS) model endorsed by a municipality, a trustworthy entity ensuring that the process is independent, transparent and of high quality for their citizens, and it is specifically focused on enhancing the homeowners' experience throughout the complete home renovation journey. But how does the HUB provide these steps? To get this information on the table BHG conducted interviews with several consortium partners in the Valencia region. Questions regarding the Rotterdam region were answered in the steering group of the pilot in Rotterdam.

In annex 1 the summary of the interviews is mentioned.

Partner	Date of interview
IVE	April 21st 2021
GNE	April 23rd 2021
Canvic Climatic	May 10th 2021
VCE	May 3rd 2021
ICLEI	May 6th 2021

Questions that were asked during the interviews:

1. What is, according to you, the role of the HUB? (primary function)?
2. What form goes with this role (physical – digital – hybrid) and to what extent?
3. We try to bring a lot of functionality into the HUB. But what is the most important added value of the HUB?
4. Who owns the HUB, and what role does your organisation have in the HUB? (i.e. who pays for the HUB)
5. What kind of solutions (range of solutions) does the HUB offer? Are these solutions already available?
6. What parties are missing at the moment to get the HUB up and running. Do you have suggestions who to contact?
7. Are there any functionalities that is not spoken of at the moment, but you think are necessary to create a successful HUB?
8. When the StH-project ends, what is the first step to take, to continue the HUB?

3.1 Overall outcome

The technical workshop discussed in chapter 2 (June 2021) lets people see what the opinion of all consortium partners are. The interviews in chapter 3 have an added value to this workshop, because we could get into detail on specific topics. When looking at the overall outcome of the interviews we can see the following vision:

Source of information

- The role of the Citizen Hub is to give reliable **information**

Trust

- **Trust** is the key element

Connection

- The Citizen Hub should **connect** between owners, organisations and contractors

Platform

- The Citizen Hub should be a **combination** between the digital platform and a physical place to meet

Futureproof

- The Citizen Hub should offer standard solutions with (later on) the possibility for personal customization per house/dwelling typology (**development**)

Participation

- Contractors and suppliers need to be "**seduced**" in order to participate in the Citizen Hub

Based on the outcome in this deliverable we came to a definition:

Definition of a HUB

A HUB is trustworthy place, where citizens can get information, in a digital or physical way, to get acquainted with (sustainable) renovation, the measures, the finance and the impact it has on living. Besides information, it functions as a gateway towards contractors, suppliers and intermediates, so that individual homeowners can actual make the step towards execution.

This definition gives direction on what a One Stop Shop should deliver. It does not depict one solution, but acts as a platform on which several solutions and ways to reach those solutions are accessible. That allows for new solutions or ways to reach out to people in the future.

Save the Homes

4 Workshop on renovation activities

On June 3th 2021 the second technical workshop was organised. On the agenda were the demand and supply side the customer journey and the start of the citizen HUB. During WS2 we discussed the role of the HUB with the use of a MIRO-board. The preliminary results of the interview were used as starting ground for the grouped development session.

4.1 Motivation

The demo case In Rotterdam shows us that setting up a HUB is not just about putting energy measures together and advertising them to the citizens. The talk in the Rotterdam case focuses on the **roles of each party** and who is responsible for what. The municipality is in the lead but does not always want that role, or is fitted to fulfil that role. It is in line with the shift towards a **'participating society'**. However, it is too soon to expect players in the market to assume that role on their own. There is some need for an extra push. This situation asks for a lot of finetuning before the outlines of a HUB can be defined.

In the Valencia demo case the Energy Office already functions kind of as a HUB. There it is less about roles, but more about how you can **optimize** what is already in place. In light of deliverable 4.5 (risks) we dedicated this workshop to the process of the HUB and the connections between tasks.

To speed up the process of demonstrating, we would like to start using *existing* channels, so the decision making is not necessary (or on a project level instead of a strategic level) which costs less time. Also when looking to the upscaling as described in 6.3 we pick the best channels and use them. However, if we want to use existing channels, we need to know what these channels are, both in Valencia and Rotterdam. Therefore the **roles**, **quality** and **risks** are shown in chapter 7.

4.2 Approach

In this workshop we used a model that indicates all the necessary phases of a renovation and asked all consortium partners to fill in existing activities and new (wanted) activities.

The base of the figure consists of four quadrants, that make up an **entire renovation**. In the workshop each quadrant was handled separately, by adding post-its. Green for existing and pink for new channels. Afterwards, these post-it's were rearranged and labels were added that summarises the input of that particular part of the quadrant. It shows what is needed in each section.

With this outcome and the recommendations in Annex 3, figure 43, we can complete the risk assessment of for Valencia and Rotterdam. It shows what can be added. For the follower cities (and the cities to come) it can function as a guide
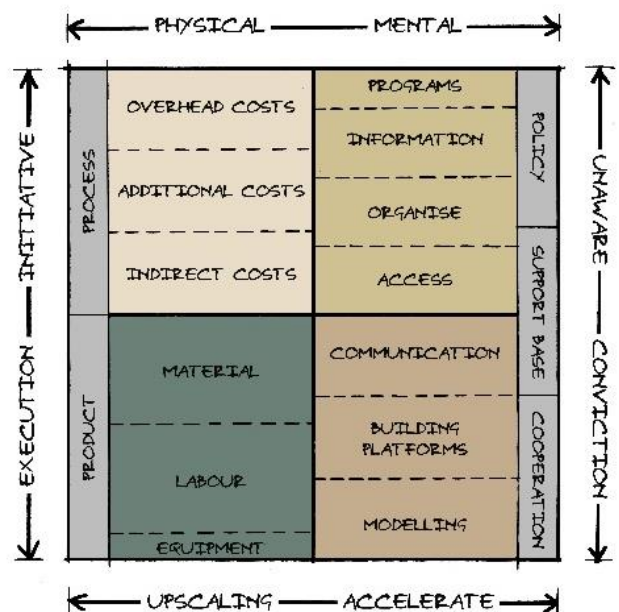
Figure 13 necessary phases of an Integral Renovation

in setting up a local HUB. Figure 14 shows the existing channels and new channels that are needed to bring renovation solutions to the market.

Existing Channels	New channels
Budget for staff	Payment for advice
Contractor involvement	Revenue model
Digital tools	Communication with citizens
Solution guide	Local SME
Calculation model	Trusted labor
menu	Simulation app
Project aggregation	Rating labor (list)
Policy	Quality control
Framework like XALOC	Grants /subsidy
Concepts	Adapting regulations
Building passport	Single portal communications
Less administration	Ambassadors
Training	Government message
Time for follow up	Message from a platform
Alex Energie	Independent platform
Existing channels	Database of success
Reusing models	
P2p models	

Figure 14 An overview of changes and currently available tools/instrument

Annex 3 shows the complete outcome of this workshop, and how to put it to use.

5   Action plan

This deliverable, as part of task 4.4 of the Save the Homes proposal is concerned with the actual execution of the pilots. However actual execution only started late, and in a different way than anticipated in the beginning. So the two aspects are

1) **Action plan:** The objective for the pilot renovation action plan is to describe all the pilot stops activities and its time spans, definition of the specific milestones, potential risks and contingency plans.
2) **Execution:** the way this is executed is described in accordance with relevant key stakeholders that are involved to oversee the pilot activities in an efficient way.

In chapter 5, the actions are described. In chapter 6 the execution will be described. Finally in chapter 7 all individual steps are elaborated on, step by step. To get a quick overview of all these steps, Annex 4 can be used.

The action plan is to be based on the requirements that were defined for the HUB during the technical workshop, during the Miro board session. To recap from chapter 3, the HUB needs to cover the following aspects:

- It has to give reliable information
- Trust is the key element
- It should connect between owners, organisations and contractors
- It should be a combination between the digital platform and a physical place to meet
- It should offer standard solutions with (later on) the possibility for personal customization per house/dwelling typology (development)
- Contractors and suppliers need to be "seduced" in order to participate in the Citizen Hub.

According to the interviewees the main role of the Hub is the provision of information, where trust is a key element. It is important that this is incorporated into the HUB, in order to get a fully functional and reliable organization to scale-up the renovation of homes. If the information given is not reliable, then there will be no replication after one renovation project and the organization will have no more work. This is also in correspondence with trust. If there is trust that the solutions and financial plan is stable and good, then the homeowner feels good. Hence he will comment positively about the work. Furthermore, as mentioned it should be reliable, where the offer needs to be validated and it should function as a place of connection for owners, organizations and contractors (open to all stakeholders). The question is whether the HUB should provide this **all at once**?

It could be a combination between the digital platform and physical place to meet. It should offer standard solutions with (later on) possibility for personal customization per house/dwelling typology. But customization may not stand in the way of reproduction of the HUB services. It has a lot to do with unburdening the homeowner. When homeowners start renovating their homes, they need to figure it out all by themselves. Finding a solution that will fit their needs, finding the financial solutions so that they can pay for the renovation and finding the right contractors that ensure the quality of the work done is reliable. If a HUB can **unburden** the homeowner in regards to these searches it has an added value. Therefore the one stop shops are often referred to as Integrated Home Renovation Services (IHRS).

The Save the Homes project has two pilot locations, Valencia and Rotterdam. Both are large cities in their country (Valencia 790.000 inhabitants, Rotterdam 320.000 inhabitants), and both municipalities are looking for ways to improve the adaptation of sustainable measures in the built environment. But the eco system in which these measures need to be taken differ from each other. Therefore both pilots are described on their own, first Valencia. (5.1) and then Rotterdam (5.2). it is good to know that both Cities are part of the **EU Mission on 100 climate-neutral and smart cities**, just like Ljubljana, one of the follower cities, so these cities are already the frontrunners in Europe.

5.1 Valencia

5.1.1 Levels of decision-making

Decision making has to be done on different levels:

- For the region, taking into account specifics in the whole Valencia province.
- For the city, taking into account the differences between each of the neighbourhoods (dimensions, characteristics and needs of the residents).
- For the different stakeholders involved:
    - o (District) Offices.
    - o Homeowners.
    - o Professionals.
    - o Financial institutions.

Regardless of the levels at which decisions are taken, it is necessary to consider the context, not only at the national level as a result of European directives, but also taking into account regional and municipal specificities.

National level

The COVID-19 pandemic created a crisis that aggravated the pre-existing structural problems in housing. On April 30, April 2021, the Spanish Government presented the **Recovery, Transformation and Resilience Plan**[5] to the EU, whose objectives included the need to reform housing guarantees. This plan gives a central role to housing policies through renovation actions, and dedicates its Component 2 to this matter under the title "Housing Renovation and Urban Regeneration Plan".

One of the objectives of Component 2 is to activate a renovation sector in Spain that will make it possible to decarbonize and improve the quality and comfort of the existing building stock. The objective is to produce a substantial increase in the rate of renovation of the building stock with models that, due to their technical and financial viability, can be sustained in the medium and long term. In this way, the objectives of the **National Integrated Energy and Climate Plan**
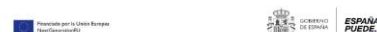
Figure 15: Spanish Recovery, Transformation and Resilience Plan – Component 2 (June 2021)

---

[5] https://planderecuperacion.gob.es/

(PNIEC[6], 2021-2030), within the framework of the **Long-term Strategy for Energy Rehabilitation in the Building Sector in Spain** (ERESEE[7], 2020), would be achieved.

All things considered, the development of this plan on a regional scale in the Valencia region requires the involvement of the different levels of government, both autonomous and local.

European level

As can be seen above, the objectives of Component 2 of the Spanish Recovery, Transformation and Resilience Plan are in line with the **European Renovation Wave** (2020).

Through this strategy, the European Commission aims, beyond improving the energy efficiency of buildings, to at least double the rate of retrofitting over the next ten years and ensure that retrofitting leads to greater energy and resource efficiency.

*Figure 16: Renovation Wave.
The European Green Deal (2020)*

Some of the lines of action set out by this strategy are:

- Tighter regulations, standards and information on building energy performance to establish better incentives for retrofitting, including a gradual phase-in of mandatory minimum energy efficiency standards for existing buildings.
- Ensuring accessible and well-targeted financing.
- Increasing capacity to prepare and implement retrofit projects, from technical assistance to national and local authorities to training and skills upgrading for workers.

The European Commission recognizes that local and regional authorities are an indispensable level of government for the implementation of this strategy and the need to address the obstacles and constraints in moving from the EU to the national, regional and local levels, building on bottom-up initiatives, promoting synergies between the different levels of government and reforming the relationship between citizens[8].

Regional level

In the above context, at the end of 2021 the Decree 199/2021[9] of December 10 was published, creating the network of local housing, renovation and urban regeneration offices of the Valencia region (**XALOC network**[10]). This network was conceived as an instrument of cooperation and inter-administrative collaboration between the regional

Figure 17: XALOC network – Local housing, renovation and urban regeneration offices of the Valencia region (2021)

---

[6] https://www.miteco.gob.es/images/es/pnieccompleto_tcm30-508410.pdf

[7] https://www.mitma.gob.es/recursos_mfom/paginabasica/recursos/es_ltrs_2020.pdf

[8] https://cor.europa.eu/es/news/Pages/the-renovation-wave-interview-enrico-rossi.aspx

[9] https://dogv.gva.es/va/resultat-dogv?signatura=2021/12753&L=1

[10] https://calab.es/red-xaloc

administration and the local entities in the field of housing, renovation and urban regeneration.

This decree was committed to a model of proximity in customer service and established six strategic lines of action, being one-stop shops, collaboration in the processing and management of grants to citizens and urban renovation and regeneration three of them:

- The first line of action consists of the creation of one-stop housing offices, whose objective is to enable citizens to go to a single office to receive advice, information and assistance in housing matters.
- The second line of action contemplates collaboration in the processing of housing, urban regeneration and renovation grants by local entities through the XALOC network, contributing to the streamlining of the established procedures.
- The third line of action is aimed at supporting specific activities in the field of renovation and urban regeneration.

Municipal level

Within the framework of the aforementioned Recovery, Transformation and Resilience Plan 2021-2026, the Valencia regional government published a program of economic aid for the retrofitting of neighborhoods for municipalities in the region. One of the objectives is to finance the joint execution of retrofitting works in buildings of predominantly residential use and housing, including single-family homes.

Among the eligible actions of this plan, in addition to the refurbishment of predominantly residential use and housing, including single-family houses (obtaining a reduction in non-renewable primary energy consumption / global energy demand for heating and cooling of 25-30-35%, depending on the climatic zone in which the building is located), the provision of retrofitting services for offices is contemplated, conditioned to the execution of retrofitting works.

Figure 18: Valencia regional program to support retrofitting actions at the neighbourhood level

In the specific case of the city of Valencia, February 2023 the Local Government Board was pending approval of an agreement for the retrofitting of several housing groups in the city, with the involvement of the Housing service to accompany the processing and management of financial aid, and VCE to advise on construction projects. It was also announced the launching of the neighborhood office to inform citizens about the actions to be developed, regarding the reduction of energy demand and consumption, among others.

5.1.2 Risks and roles of the partners for the HUB

The following table shows the main risks and roles related to the commitment and coordination between all involved region partners:

Valencia HUB partners	ROLES	RISKS
Valencia Institute of Building - IVE	- Coordinating the exploitation within Valencia region. - Defining the different stops in the Citizen Hub. - Transferring main results to policy makers in the Valencia region with the aim of improving housing policies and strategies. - Replicating the Citizen Hub model at regional level supported by the Regional Government. - Developing renovation packages adapted to the characteristics of the region's residential buildings.	- Lack of awareness on the demand and supply sides. - Lack of credible pipeline of projects. - Business model sustainability and replicability.
València Energy Office VCE	- Base for the pilot of the Citizen Hub in the city of Valencia. - Carrying out engagement campaigns addressed to the homeowners in the city. - Supporting the two follower cities in the replication phase	- Lack of municipal resources. - Citizens are dissatisfied with the works. - **City failing to facilitate faster and smoother renovation process.**
Association of Property Administrators València & Castellón	- Enabling direct contact with homeowners. - Acting as a link among the demand and the supply side in the Valencia region. - Carrying out engagement campaigns to recruit homeowners to renovate their homes. - Implementing optimal technical renovation packages and best financial models for the managed buildings. - Accessing a large part of the home owners	- Lack of enough skilled support personnel (administrators have different profiles). - Acceptance as trustworthy advice

Figure 19: Risks and roles of the partners for the Valencia HUB

A strong **commitment and coordination** is needed from IVE on behalf of Valencia region, València Energy Office on behalf of València city local authorities and the Association of Property Administrators of València-Castellón as essential agents in the renovation process in the case of multi-family buildings. In addition, it is necessary to take into account the possible risks of all local actors involved (neighbourhood associations, large companies and SMEs, self-employed workers, project developers, product and service providers, etc.) to mitigate potential risks and achieve a balanced, effective and efficient service. But with IVE as a back up with knowledge the Valencian project has a solid partner.

5.1.3 Risks on quality control, scale-up, labour and execution

As anticipated in the project proposal, the scalability and replicability of the project results relies on the accurate characterizarion of the **different ecosystems**, based on reliable and relatable parameters defining the main influencing features of the different ecosystems they describe, these risks will reoccur in the following chapters:

Save the Homes

Description of risk	Proposed risk-mitigation measure
Lack of awareness on the citizen side: Citizens are not sufficiently involved, there is a lack of applications and interest.	Targeted marketing campaigns and informal local onboarding activities increased; Dissemination actions at a community level to address the issue.
Lack of credible pipeline of projects: Citizens are applying for renovation, but few applications become actual projects.	The customer journey mapped in detail to identify all touch points and understand where the biggest attrition happens for citizens, thus improving the process.
Citizens are dissatisfied with the works: Complaints and dissatisfaction part of the home renovation process. After projects are completed file complaints and are not happy with their renovations.	Citizen feedback taken seriously and lay a role of the mediator (if needed), ensuring the process is resolved to the client's satisfaction. Procedures to be amended if a systemic issue is identified during the complaint review.
Lack of skilled support personnel: Person in charge of the OSS misguides customers or is incapable of offering the applicable options to a customer situation.	Staff training package designed for this issue. Through EU member organizations capacity building.
Lack of municipal resources: Cities administering the pilots lack people, funding, space, and time to properly run the Citizen Hubs due to competing priorities and political changes.	Using neighbourhood associations offices and energy services professionals (i.e., once/twice a week) to compensate. Organizing events with support of the supply side (technical suppliers, financers). Addressing the issue at the political level.
City failing to facilitate faster and smoother renovation process via work permits, authorizations, and other policies.	In this case, each work/project needs to ask for an individual permit. Professionals are prepared for that already and the business model and customer journey will be adjusted accordingly.
Lack of affordable bank financing: inability to put in place referral agreements with local banks to ensure quick access to financing.	The Citizen Hub relying on existing local financial opportunities' (grants, subsidies) and informing citizen of the existence of other options. At the request of the city, other financial instruments put in place to provide access to up-front and long-term financing.
Business model sustainability: Business model does not work after the project finalization (do not generate income enough to continue functioning).	Business model reviewed and friction points identified. Recommendations made to cities and other parties for how to improve it. The Consortium using agile methodology to assess the progress every quarter.
Replicability: Impossible comparability between EU regions. Ecosystems' data gathered in such a way that other EU regions cannot relate to them, thus cannot learn from the others experience (due to data availability sources or time-period out of the guidelines, protocols established by the project).	If external circumstances force that data gathering cannot pursue the established protocol, filtering and homogenization processes will be applied on them to enable comparability, and this circumstance will be warned when consulting the data. Lists of similar regions will be provided. .

Figure 20: Critical risks for implementation anticipated in the project proposal (table 3.2b)

5.2 Rotterdam

5.2.1 Levels of decision-making

Decision making has to be done on a different levels:

- For the city
- For the district (programs)
- For the (energy) office
- For the owner
- For the user
- For the entrepreneur

Here, we need to respect both international and national policies and climate visions. In the case of Rotterdam they are COP2015, Country (Klimaatakkoord NL), City (Rotterdams klimaatakkoord), Region (Warmtevisie), Neigborhood (PAW), Area (Wijkuitvoeringsplan), Apprentices agreement (Leerwerkakkoord), Energy funds (ETF) & Social Return Of Investment. Within the project, the focus of WP4 is for both cities to get in touch with people. For the case of Rotterdam that is trying to start **locally via Alex Energie**. Using existing knowledge, experience and demonstration projects to start a small 'renovation wave' in a part of the city. Replication then consitsts of repeating this prcoess in another part of the city.

COP2015

The 2015 United Nations Climate Change Conference, COP21, was held in Paris. The participating 196 countries agreed to the final global pact, the Paris Agreement, to reduce emissions as part of a method to reduce greenhouse has. The countries agreed to reduce their carbon footprint as soon as possible and to do their best to keep global warming "to well below 2 degrees C" and prefarably 1.5°C. It was mentioned that this "ambitious and balanced" plan was a "historic turning point" in the goal of reducing global warming. However, others debated that most of the sections are only promises and aims and not commitments by countries themselves. [11]

Country - Klimaatakkoord Netherlands

Klimaatakkoord[12] (climate agreement) is part of the Dutch climate policy. It is an agreement between a lot of companies and organisations in the Netherlands to reduce carbon emissions. This is done in order to reduce the global warming as agreed in the COP2015. The Klimaatakkord was derived by splitting the task into '**tables'** that each contirbute to a sector: built environment, industry, transport, agriculture, energy and miscelaneous.

The most important goal of the Klimaatakkoord is to reduce CO_2 emissions by 49% in 2030 compared to 1990. By 2050, greenhouse gas emissions must be reduced by 85-95%. This is necessary to ensure that global warming does not exceed 1.5°C. With this temperature increase, the consequences of

Figure 21 Climate Agreement

---

[11] *Source: https://en.wikipedia.org/wiki/2015_United_Nations_Climate_Change_Conference#Outcome*

[12]

climate change should still be manageable. This should be affordable for everyone. That is why the steps to reduce CO_2 emissions are feasible and affordable for everyone and the government spares housholds wallets as much as possible. The government also ensures a fair distribution between citizens and companies. In addition, the Netherlands takes its time: measures are taken step by step. More than 100 parties (governments, the business community and social organisations) worked in 2019 on a package of measures that will have its CO_2 emissions. The government is also taking a number of measures to ensure that the statement and the bill are distributed fairly. This means for example, that the tax on the energy bill of households with an average consumption was reduced by 100 euros in 2020. In subsequent years, the increase in energy tax will be limited. There will also be a CO_2 tax for the industry, allthough this is still a hot topic. As everyone has to deal with the Climate Agreement, the government will take 30 years to make the changes feasible for everyone. In the coming years, the governement will unburden people with a neighbourhood-oriented approach. The government also encourages people to invest more in sustainable driving and insulation of their homes at a time that suits them.[13]

City - Rotterdams Klimaatakkoord[14]

In 2019, more than a 100 Rotterdam companies, institutions and governments jointly drafted the 'Rotterdam climate Agreement'. The aim of this agreement is to connect parties to work together on the Rotterdam Climate Objectives:

- Achieve a **trend break** in CO_2 emission within four years
- From an annual increase to a sharp **decrease** (the downward trend has already started)
- A **49,6%** decrease in CO_2 emissions in 2030 compared to 1990.

The Rotterdam Climate Agreement consists of five climate tables that jointly concluded 49 climate deals in 2019 (but now already more than 50 deals exist) with concrete measuers that contribute to those climate objectives. In addition, the agreement also contributes to the other sustainability objectivs of Rotterdam and they are working on the economic and social development of Rotterdam.[15]
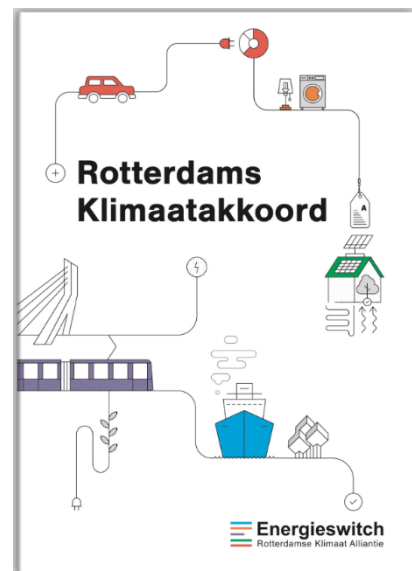

Figure 22: Rotterdam Climate Agreement

Region – Warmtevisie Aardgasvrij

In this vision it is described how Rotterdam intends to stop using **natural gas** for heating, cooking and showering. This is done on the basis of four parts: why, what, when and how. The Heat Transition Vision looks at *what* is going on in the neighbourhoods and what the best solution is. Based on that, it is decided when and where Rotterdam gets started. The Heat Transition Vision is related to other plans for sustainability. It is one of the building blocks for the Rotterdam Energy System Vision[16], which is published in 2021. This adaptive strategy provides insight into the long-term development of the

---

[13]*Source: https://www.rijksoverheid.nl/onderwerpen/klimaatverandering/klimaatakkoord/wat-is-het-klimaatakkoord#:~:text=Het%20belangrijkste%20doel%20van%20het,oplopen%20dan%201%2C5%20%E2%84%83.*

[14] https://rotterdamsklimaatakkoord.nl/

[15]*Source: https://rotterdamsklimaatakkoord.nl/klimaataanpak/het-akkoord*

[16]chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://duurzaam010.nl/app/uploads/2021/06/Rotterdamse-Transitievisie-Warmte-1.pdf

Rotterdam energy system and indicates what is needed – infrastructure and (sustainable) sources – to make our energy system sustainable.

If Rotterdam switches to sustainable energy, that is quite something. It will be quite a job with a major impact on the city. Because, at the moment we still use plenty of natural gas, especially for heating and cooking. As a municipality, Rotterdam has conducted extensive research into the possiblities. This resulted in the Rotterdam Heat Transition Vision. It is an advice to the college of mayors and aldermen from 2022 onwards.[17]

Neighbourhood – PAW[18]

In the intergovernmental Program "Programma voor Aardgasvrije Wijken (PAW)", the ministry of Interior and Kingdom Relations, the minstry of Economic Affairs and Climate Policy, the Interprovincial Consultative Body, the Union of Water Boards and the Association of Dutch Municipalities work together to provide the municipalities and involved parties with the best **possible support**. Support in the natural gas-free task. Together, they learn how the neighbourhood-oriented approach can be set up and scaled up. On the basis of pracitcal experience, bottlenecks are identified, put on the agenda and where possible solved. They do this through a Knowledge and Learing Program (KLP) and large-scale testing grounds – 66 of which have already started. The KLP and the pilot project provide a flywheel, so that municipalities, together with the parties involved, are able to start with the neighbourhood-oriented approach on an increasingly large scale.[19]

The task of getting areas and cities off of natural gas is an **extra politcal goal** in the Netherlands. Where other countries, like Germany, are switching towards gas, the Dutch policy is to get rid of all natural gas connections. This is a huge task, as more than 80% of the homes has a gas connection[20]. This direction of policy has two bases. First of all the Netherlands has a hue gas-reserve in the province of Groningen. However gas extraction causes movement in the earth, resulting in earthquakes and settings of the earth and damages to buildings. This discussion has been going on for decades, but now the decission is made that **gas extraction** will be deminished. The second reason is that the Dutch government wants to be **less dependent** of foreign countries that export gas. This means that there is an extra driver for the energy transitions, but energy efficiency and no natural gas are not automatically the same, and often put in separate governemental programs. It allows for extra measures, as for example PAW offers millions of subsidies to get complete areas off the natural gas, but CO_2 redcution is not necissarily incorporated.

Figure 23: infographic of PAW (natural gas free areas)

---

[17]*Source: https://duurzaam010.nl/thema/hoe-en-wanneer-aardgasvrij/*
[18] https://aardgasvrijewijken.nl/
[19] *Source: https://www.aardgasvrijewijken.nl/overpaw/default.aspx*
[20] Source: https://www.natuurenmilieu.nl/wp-content/uploads/2018/12/NM-rapport-Verkenning-Energienetten-2018.pdf

Leerwerkakkoord – Apprentices Agreement

In the apprenctices agreement, government, education and the business community from the labour market region of Rotterdam – Rijnmond join forces. They do this for a future-proof labor market in the region, where there is room for everyone. That is sorely needed. In the near future new professions and jobs will be created as a result of technological developments, such as the energy transition. At the same time, jobs will also disappear.

Another challenge is that there are still many people on the sidelines. Think of people with an occupational disability or who have been unemployed for a longer period of time. By making concrete agreements, the partners involved invest and innovate in recruitment, training and guidance towards (new) work. This can also be aimed at keeping one's own job. These apprentices agreements have been made for the labour market of the region Rijnmond; the sector building and technology; the energy transition; facility management; the harbor; the small- and medium sized enterprises; transport, logistics, passenger transport and inland shipping; and health care.[21]

Energy Transition Funds (ETF) & Social Return of Investment (SROI)

The ETF are energy transition loans for homeowners and landlords[22]. The Energy Transition Loans are intended for energy-saving *and* home-improving measures. Inhabitants of Rotterdam with their own house (ground-bound, apartment or houseboat) can continue to live in their home more comfortably and with more pleasure. Owners who rent out their home(s) – a maximum of three – can also make use of the loan. All homes are located on Rotterdam territory. To be eligible for the loan, you must carry out at least one **energy-saving measure and one home improvement measure**, so in conclusion at least two measures. There is an exception for solar panels. The measures must be carried out by recognized contractors and/or installers. This means that they are affiliated with a trade association and/or have a quality mark. You request quotes from these recognized contractors and/or installers and send them along with your application. The municipality is not a bank. That is why the municipality is working together with the Stimulation Fund for Public Housing in Dutch Municipalities (SVn) for the Energy Transition Loans. If the municipality has approved your application, you go to SVn to take out the loan.

---

[21] *Source: https://www.leerwerkakkoord.nl/*
[22] https://duurzaam010.nl/subsidie_thema/energietransitiefonds/

5.2.2 Risks and roles of the partners for the HUB

The Rotterdam pilot consists of several partners. The three main partners are **Alex Energie**, a local energy collective, the municipality of **Rotterdam** an the **BouwhulpGroep**. Each of these partners has its own task. Each of these partners will be elaborated on.

Risks and role of BouwhulpGroep

BouwhulpGroep is a specialist in making neighbourhoods and districts more sustainable together with residents. Since 1978 the office has been working in public housing, architecture and industrialization in the existing city. For more than 30 years the office has also worked as an (house) advisor for governments and for over 30% of the Dutch housing associations. More than half a million homes of the Dutch housing stock have been examined as part of the daily practice of developers, architects and consultants, with a focus on step-by-step renovation of existing homes for all types of ownership.

The risk with BouwhulpGroep being a partner in this HUB, is that they can generate work through the HUB. In a regular renovation project, BouwhulpGroep is able to fulfil **all** individual tasks, but on a paid basis. Their scope is to make the steps more efficient. BouwhulpGroep does not deliver in terms of materials and companies that will execute the work, but the office can **step in as the supporting role** of architect-advisor. There should be a clear distinction between the roles as architect-advisor (if it is applicable) and the role as part of the start-up HUB Alexander. In the future, HUB Alexander can fill in this task **themselves**, continue with BHG or look for other entities. The risk that lies open is that gaps that lie open will be filled, but after the project there will be no one to do this filling.

An ideal customer journey does all ten steps of the customer journey (see figure 24). However, for the HUB Alexander in Rotterdam, this is not the case. They focus on **step 2 till 7**. The journey stops at the request and implementation phase. This is the leaflet that generates the information of the homes in the Prins Alexander region. But if the next step is not taken, then the project will be stuck in the theoretical phase and a practical application will fail to be implemented. This dilemma is that for citizens the project ends at step 10, but for the consortium the part that can be controlled stops at step 7.
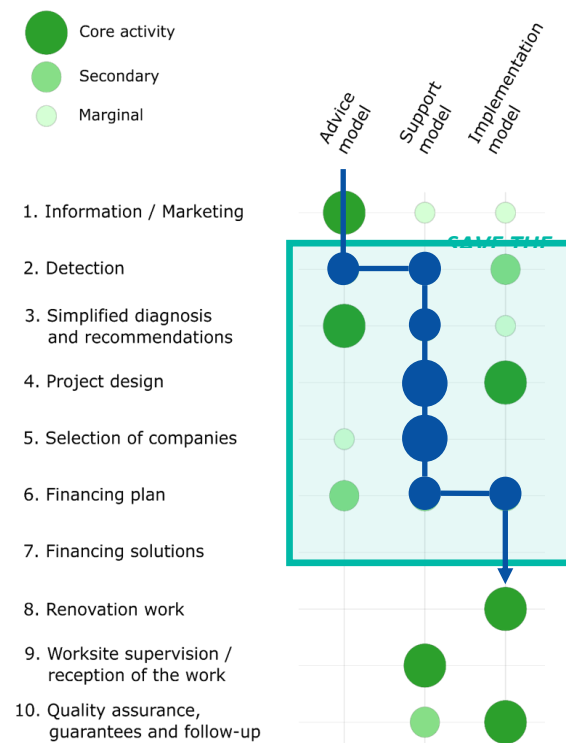

Figure 24: steps of the customer Journey according to Millin/Bullier

Risks and role of municipality Rotterdam

Rotterdam is the second largest city in the Netherlands. As per January 1, 2023, Rotterdam has 663,900 inhabitants, and more than 321,000 buildings. Prins Alexander is the largest of the city's fifteen districts with a population of 96,490 and 46,211 dwellings. To make a comparison, this is as large as the 30th largest city in the Netherlands (Leeuwarden). The municipality has quite a lot of initiatives in the city in regard to the energy retrofitting of homes. But municipalities need to remain

an **independent** entity without any preconceived notations about parties and policies of the market. Municipalities need to ensure a **levelled playing field** in their intervention while making sure the city commitments to reach the climate agreements are achieved. Promises made in one neighbourhood are a precedent for other neighbourhoods. That is also the case in Save the Homes.

The municipality has to follow legal procedures and political commitment and responsibilities. And within this playing field of obligations and responsibilities they have to support all (kind of) wishes. But with limited budget and capacity it is a difficult task and it has to draw clear frame of work when possible. It relates to the **different roles a government** must take at any given moment. Several municipalities are working towards the principles of an 'open government'[23] model. In this approach the government wants to be as transparent as possible to create a healthy relationship between authority and citizens.

Public
performance

2. Performing Government
-Performance control
-Market thinking government as company, citizen as customer
-Effectiveness and efficiency are central, a good cause must be measurable

3. Networking Government
- government in the lead seeks collaboration with other parties (umbrella organisation)
-horizontal cooperation, goals jointly determined
-negotiation or compromise, agreements laid down in agreements or covenants

Government

Market and community

1. Legitmate Government
political debate determines public interests, for example:

-implementation of legislation and regulations
-monitor rights and obligations
- procedural care is central
-good governance
-government steer hierarchical

4. Responsive participating Government
- bottom-up initiative
- network management
- government participation (can also be done without government), offer space and support to community initiatives. With organized and unorganized parties
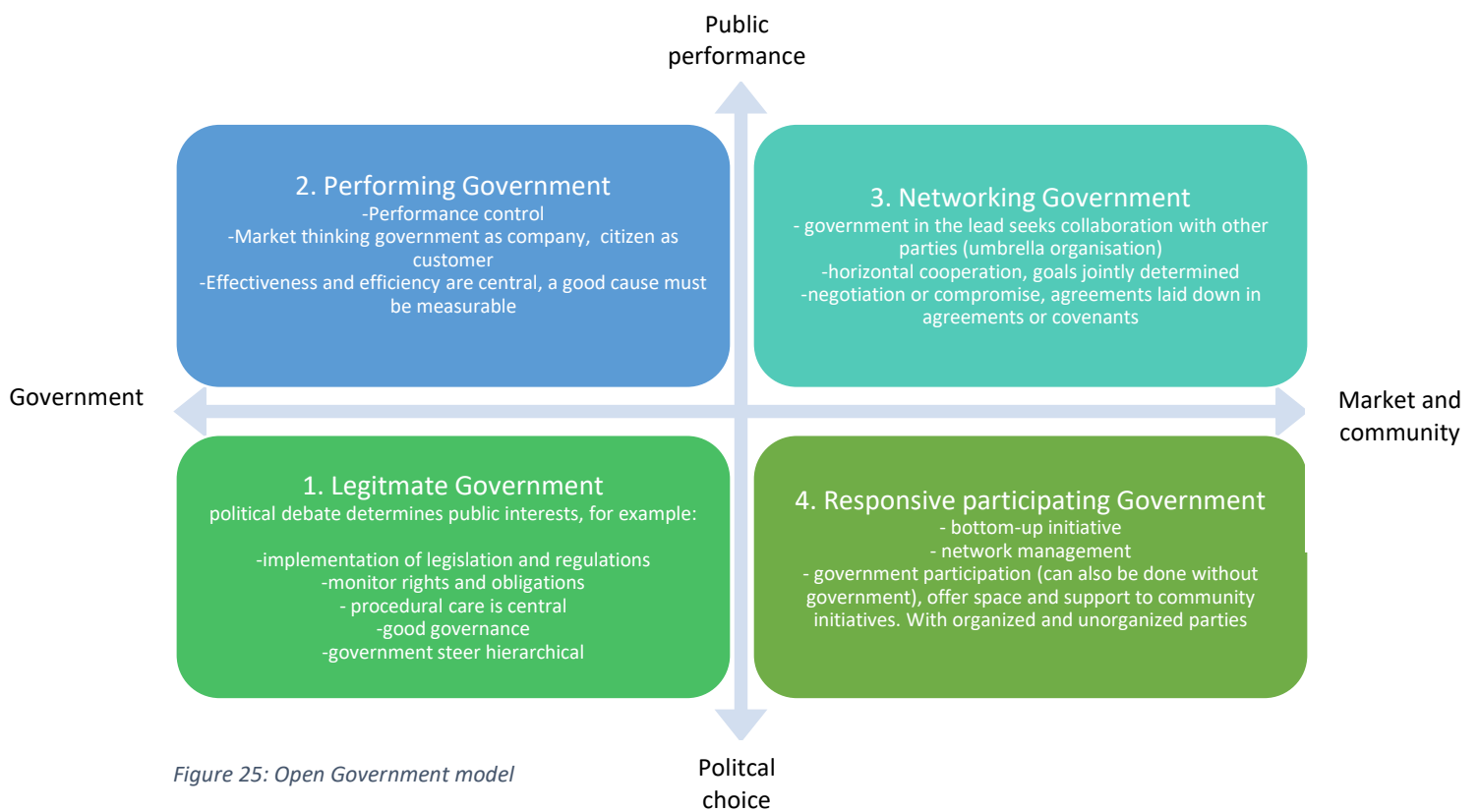
Politcal
choice

Figure 25: Open Government model

According to the open authority model, see figure 25, there are four different positions a local authority (LA) can take. Ideally the LA takes all 4 overlayed. In growth term, a LA grows from role 1 to 4. And within each domain and each program will shift towards one of these roles. This makes it very hard for a municipality to take in a position, because everything happens within a larger frame, and especially sustainability. At a pilot level, it is possible to experiment and to draw lessons from it for scaling the model. For example, the project Save the Homes fits perfectly in '4. Responsive participating Government' especially with Alex Energy as a community initiative. But the whole energy

[23] https://www.open-overheid.nl/

transition national, region and in the city as described in 4.2.1 are more bound to political choices and the local authority role, that are mainly dealt with in role 1 and role 2.

In a participating government, the municipality will not be the frontrunner in the process, but they will **facilitate** other parties in the network. The difficulty in this facilitating role are the **legal restrictions** concerning tenders and unauthorized support of market parties. So this is one of the risks for the municipality of Rotterdam.

The aim of the municipality is that the market will uptake any and all problems and that the current struggles in the city will be solved overtime, **without direct interference** of them, but with support. This support is for example providing subsidies or in case of Rotterdam initiating the **ETF loans** so people will be able to use the solutions provided by the market. The municipality has a directing role to roll out the degasification program and energy transition and in general the municipality has to find a good balance between 4 different roles according to the open authority model. This can make the energy transition quit a struggle for municipalities.

The energy transition has an urgency, and we need to set a pace to get started. In the end everyone has to make the energy transition. Just to wait until the market picks it up by itself shows a pace that is to slow. That is why at this moment a **spark** or a jump start is needed to facilitate the market to show more initiative. This problem, and subsequent risk, has been overcome with the addition of Alex Energie as the main lead for HUB Alexander. The municipality can provide that jump start, so a local HUB is up and running, and can grow towards a (self-sustaining?) entity that helps citizens in the energy transition and degasification.

It is about finding the right balance between the different roles, and even within one role looking for the right task and responsibilities. For the municipality of Rotterdam this is also an experiment, and they are learning and discovering more and more. Just like the other consortium partners. One of the topics is the agreement with a local party (like Alex Energie) about what to deliver, and what is needed (information, effort, support) to reach these results. Doing this in a pilot allows the municipality to look for chances and lessons, with a lesser risk.

About their role, but also in respect to the available budget and capacity to fulfill such a role. Because if the municipality has to do all the information and knowledge sharing themselves, they currently do not have enough staff to do so for the whole city. The energy transition is an enormous task, that any municipality cannot perform on its own. They need support of the **national government**, the market, but also from educational institutes, and finally all citizens of Rotterdam have to participate. You can put up any given program, subsidy, or idea, if people don't want to cooperate it is very hard to reach the goal. That is why the Open Government model is about transparency and in the end a participating government.

In Save the Homes the role of Alex Energy as part of the **HUB** or even to be the HUB is looked at. However, this is not yet decided and is still in a pilot phase. One example is that large solar roofs are installed on behalf of 5 energy cooperations in Rotterdam. And the revenue of these roofs can (partly) finance these energy cooperations. So Alex Energie yearly has a revenue stream.

The exact functionality within the HUB is something that is currently being discussed by the municipality together with consortium partners BouwhulpGroep, Alex Energie and GNE Finance and the ideas mentioned are put in D4.1, Documented engagement and recruitment campaigns for the two pilots (2022). The overall risk for a municipality is on one hand the need to deliver to the public, but on the other hand being aware of political goals and promises.

Risks and role of Alex Energie

Alex Energie is an **initiative of residents**, founded in 2020, who believe that we should use less energy and that the energy we need is sustainable and contributes to the broad sustainable development of Prins Alexander. They do this by collaborating with other organizations and by taking the initiative themselves to accelerate the energy transition. There are plenty of options to make Prins Alexander more sustainable, and Alex Energie is committed to this. Alex Energie is a non-profit cooperative. The money that is possibly earned, goes to the small overhead, possible discount to the customers and is reinvested in the immediate environment[24].

The risk for Alex Energie in the HUB Alexander is that they will be connected to the outcome of the HUB. This can be both good and bad. If the HUB becomes a success, then Alex Energie is also a success. But if it fails, Alex Energie fails than the bad results will **reflect** on them as well. The HUB of Save the Homes can also do all ten steps of the customer journey (see figure 24). However, for the HUB Alexander in Rotterdam, this is not the case. They only undertake step 2 till 7. The journey stops at the request and implementation phase. This is the leaflet that generates the information of the homes in the Prins Alexander region. But if the next step is not taken, then the project will be stuck in the theoretical phase and a practical application will fail to be implemented.

Next to this risk, there is also another risk as Alex Energie has started as a **volunteer** association/corporation. This leads to two questions, concerning upscaling. On one hand how can Alex Energie make the step to a **professional** organization and do they even want to be a professional organization? At the same time it is the question if they will be given this position (by the municipality). Are they able to work as a professional organization, as they will need to employ people in order to grow and meet the demands of the people. If that is the case, then Alex Energie will get another form of organization. Do they want that? And does the municipality grant them this possibility? Because of its voluntarily character it needs to be clear what they will deliver. It is sometimes said that with volunteers you have to be more strict on the rule then with professionals where there is a contact. Here lies a risk.

ROTTERDAM HUB partners	ROLES	RISKS
BouwhulpGroep	- Coordinating the StH-actions within Rotterdam region. - Defining the different stops in the Citizen Hub. - Developing renovation packages adapted to the characteristics of the local residential buildings. (leaflet) - Improvement digital renovation offer - Bringing renovation knowledge to the Hub, as part of the consortium	- - Lack of awareness on the demand and supply sides. - Lack of credible pipeline of projects, control on the citizens in the pipeline - Business model sustainability and replicability. - No mandate - After the project BHG will no longer provide renovation knowledge (as this should be done by the HUB)

---

[24] https://www.hier.nu/themas/stroom-en-gas/wat-is-een-energiecooperatie.

Municipality of Rotterdam	- Enabler in the city for sustainable improvement - Policy level - Other actions - Supporting the two follower cities in the replication phase	- Lack of municipal resources. - Lack of political support - Citizens are dissatisfied with the works. - **City failing to facilitate faster and smoother renovation process.**
Alex Energie	- Enabling direct contact with homeowners. - Acting as a link among the demand side in Rotterdam, especially Prins Alexander - Carrying out engagement campaigns to recruit homeowners to renovate their homes. - Recruiting ambassadors - Implementing optimal technical renovation packages and best financial models for the managed buildings.	- Lack of enough skilled support personnel (administrators have different profiles). - Lack of knowledge for (deep)renovations - Possible step from volunteers towards organisation

5.2.3 Risks on quality control, scale-up, labour and execution

There are several risks pertaining to the customer journey and the HUB Alexander Rotterdam that can be a barrier for the development of the HUB itself. The main risks are regarded towards the quality control, the scale-up and the labor. The last risk we can identify is the **risk of the execution** as mentioned before. In chapter 7 the customer journey is explained step by step, and all the risks are summed up for both pilots. In this chapter we will try to give an overview of risks in the Dutch pilot.

Risks in general

Upgrading the sustainability level of existing neighborhoods is necessary to achieve the objectives of the climate agreement. For far-reaching sustainability, our housing stock must be renovated not only on a large scale, but also on a high level. And all these plans need to be supported by (neighborhood) residents. The **costs of a traditional renovation** consist of 60% labour and 40% material, and labour is hard to get, especially for individual homeowners. As a result the costs for labor are increasing, making renovations even more expensive. There is a growing need for a more efficient way of renovating. To start, we use a methods that already exist, to accelerate renovation: Component Renovation (CR).

Component Renovatie© (Dutch for **Component Renovation**) is a method developed by the BouwhulpGroep that has been used since 1997 to organize **repetition** in product, process and collaboration in the daily practice of renovation[25]. This repetition gives room for the necessary innovation for scaling up and increasing the impact through CO_2 savings, without higher costs. By dividing a house into components, the existing housing stock is structured in a different, more efficient way. Instead of a traditional division into housing type and year of construction, each component is structured to form and use. With Component Renovation we can translate all the individual wishes of

---

[25] *Source: https://www.duizendwoningenperdag.nl/duurzaamheid-2/component-renovatie-de-heilige-graal-voor-opschaling/*

residents into production flows that can be bundled into a collective request that is prepared for industrial production, assembly and financing. Because the focus lies only at the component, the efficiency can be improved and so the traditional balance between labor and material can shift (working towards more affordable pricing). Also, by working in components, you can search more focused for market parties that can do the renovation, than when you need to search for an all-inclusive market party.
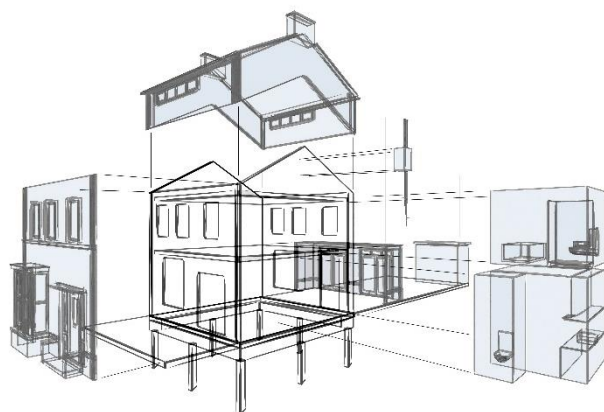

Figure 26 Component Renovation (c) made visible

Sustainable home renovations do not only have an impact on the building sector, but also affect the transport (bringing building materials and people to the site), **industry** (producing materials) and **infrastructure** (energy production) sector. But we must be aware not to create a new problem and as such a new risk; by adding new materials like insulation and installation the material part of the environmental burden (industry) will increase, so next to energy reduction circular solutions are needed as well.

Over time, all kinds of changes have taken place with regard to the quality of the homes to be built, of which the size and construction technique have been the most decisive changes. Although the aspects of urban design and architecture should not be underestimated when determining the adaptation options and future value of homes. They form the **conditions** for a meaningful future. All qualities together determine the value of a house or residential building and guide the desired and possible quality adjustments. The size of the house size fluctuates over time. It has not been a continuous growth. The economic situation influences the size of the homes in a period. Although this is not immediately apparent in the development, which is given for each construction period. For example, in the second half of the 1920s, the 1950s and the 1980s, relatively small buildings were built. And now, with the financial crisis, it threatens to happen again. It seems to be a recurring phenomenon with a thirty-year cycle, which affects the size of the home downwards.

In general, the risks pertain to the economy and materials. These terms are always a risk when starting a renovation. The economy is dependent on the market, not just in the Netherlands, but worldwide and we cannot predict how this goes. The same goes for materials.

Risk of costs

When doing a renovation, one of the main risks homeowners have troubles with is the cost of the renovation. Often we see that the renovation of a home is very expensive and the homeowner is not able to **pay this upfront** or in one go. We see that banks are reluctant to give loans in regards to renovation projects and to people with a lesser income, or a flexible contract for their job. Within Save

the Homes, we are currently looking for suitable financial solutions for the homeowners in Rotterdam, so as to take away the risk of not being able to renovate. The national solution is the 'Nationaal Warmtefonds'. This is a loan with a lower interest rate of 7 -20 years. The solution is aimed at measures that cause reduction. In Rotterdam this solution was set in a broader perspective. The 'Energie Transitite Fonds lening' (ETF) [26] offers a loan up to € 65.000,- that is applicable for energy reduction, as well as home improvement. It is a revolving fund, so as long as the program is running citizens are able to apply for it. That means that financing the home improvement is covered by this program. One of the risks that came into light is that especially people with the lowest income sometimes not get through the **credit check**, and are not eligible for the loan, although they would benefit the most from it. In practice the loan would be lower than the amount saved by energy reduction, so it would be good for them. This hiccup has the attention of the municipality. Especially in light of the energy poverty approach. More on the financial side of this can be found in deliverable 4.6.

Risk of quality control

The risk for quality control is a serious one. It is important as a HUB to offer stable and reliable solutions for renovations that ensure a certain level of quality, in agreement with what the homeowners had in mind. If this quality standard is not met, then the consequences for the HUB can be quite severe, as there will be bad press and less people will want to do renovations through the HUB. However, the question remains on how to ensure that the **quality control** is independent of the services of the HUB and the market parties that execute the renovation. It goes without saying that the quality control needs to be done by a third independent party from the market party that did the renovation and this is something that needs to be done in several steps. Not only looking at what the final product was that was delivered, but also interview the homeowner(s) who had the renovation done and what their conclusions and opinions of the **renovation process** as a whole were. This can be done via interviews (digital or physical) and questionnaires. In this way the feedback gathered at the end of a renovation project can be put into a database and can be used to improve the renovation process in the next project. This is something that still needs attention during the start-up of the HUB and we need to take into account.

In an ideal process we have a team in place that will execute the renovation in the area, and when finished goes on with the next renovation in the area. That way **knowledge** (on archetype and solution) are being kept in the area. Then feedback loops to the contractor are of value. And the work will improve over time. The actual situation is that it is hard to find a contractor even for one job. This party is not inclined to stay in the area for another job. Therefore a feedback loop can be in place, but the results will not put at use in the area. Especially in a start up phase this is difficult. You are looking for a contractor, and are glad to find one. So you will not ask to much (extra) effort of him for a next round. But then there is no feedback. The best way is to look for a contractor that sees the value of a renovation flow and that wants to invest in such a flow. With that party the needed quality can be monitored. Until this moment such a party has not been found. (See also Annex 6)

Quality control on renovation solutions is especially important when **several independent solutions** are applied, like such was done with the building collective. All solutions on their own are good, but how to ensure that the combined measures provide the wanted situation? And if it does not meet the standard, who is responsible for it? That is another reason to use components rather than products. In that case the contractor is responsible for the component and not for just a single product.

---

[26] https://www.rotterdam.nl/energietransitielening-voor-particuliere-woningeigenaren-aanvragen , see also page 30.

In the pilot of the 10 dwellings, it was not possible to find one party to do all the work. A building collective was formed, consisting of self-employed parties. A renovation manager was added, to ensure all work was done, without any gaps between the activities. But this case makes it even harder to ensure quality control.

Risk of scale-up

About two thirds of the Dutch housing stock shows more **similarities** than differences. The terraced, maisonette, porch and gallery houses are especially part of this. It is precisely the discovery of the patterns of similarities within this group of homes that offers opportunities for a new offer that utilizes the scale and at the same time leaves room for the call for an individual approach. It allows for menus and concepts to develop renovation solutions for a larger scale.

It is the patterns, based on the properties and characteristics, that make the type classification possible (archetype). The qualities used vary. However, that variation is not random. The context determines how we build. The economic situation, regulations and the social context determine how a house is built and thus form the potential for the future. This means that the past determines what is possible with a home in the future. This also means that, because there is variation, different homes can be used for different target groups.

The Dutch housing stock can be reduced to a select number of facade, roof and space families. And for these families, **standardized solutions** and products can be developed that can be applied directly to a large part of the 7.6 million homes. For example, industrialization within the built environment can accelerate sustainability, product and process innovation. In addition, this approach ensures that individual residents can also opt for a thorough renovation without their neighbours having to participate directly.

The risk however is in the scale-up. It makes a difference for a contractor if he has work for one project or work for one year. Clients need to be willing to invest long-term in the solutions offered by the market for renovations. This risk is closely related to the risk of labour. If a contractor can get work for one project or for one year, the investment in his personnel will be different. New contracts and new ways for working together will be needed in order to ensure a successful scale-up. There are, however, also social barriers for renovations:

- A major barrier for a large-scale deep renovation in European cities is the absence of organized and **coordinated synergy** between social collective interest, private collective interest and individual interest.
- Lack of **information and awareness** among homeowners about possibilities for deep renovation, both on renovation products/kits, with fragmented process on renovation works and financing. Supply side driven renovation market causes a mismatch with users' needs, complex organizations blocking investments.

Risk of labour

The young craftsman or professional woman who will start her career tomorrow with the renovation of existing homes is assured of a **lifetime of work.** All homes in our country must undergo a sustainable improvement sometime in the next 30 years, after which they are beautiful, sturdy, functional and CO_2 neutral again. But who are these professionals, who will soon ring your doorbell to get started in your home? Where do they come from? How are they trained and what guarantee do you have that they will do everything right at your home the first time?

The task of meeting the climate targets in 2050 with the built environment means quite a bit for employment in the construction industry, given the already tight labour market. The EIB (Dutch acronym for Economic Institute for Construction) outlines in its publication: "Election program against

the light: the housing market[27]" the extra investment required to make existing homes with a certain label comply with the climate target. When you link this to the Energy Label database of RVO, the Netherlands Enterprise Agency (WOoN2018), you reach an additional investment of more than 10 billion euros if you spread this over a period of 30 years. The EIB publication: "Prospects for construction production and employment in 2021[28]" provides a picture of the expected employment in executive construction, broken down into new construction, maintenance & repair and renovation. When you convert these figures to housing construction and correct for the difference in labour productivity (the EIB maintains the same labour productivity for the three categories), you get an idea of what that extra environmental investment in existing construction can mean for employment. It follows from the calculations that an **additional 16,000 man-years are required** each year[29]. According to the EIB, without that **extra** environmental investment, 16,000 man-years would already have to be found. So this number is doubled. All these figures do not include the fact that the age of our housing stock will increase the need for repair, renovation and maintenance, especially among private individuals, and environmental measures will be combined with this. In other words: investment in existing buildings will only increase and with it the need for additional, adequately trained labour. The simple principle remains that in order to actually save CO_2 in the built environment, people must first actually be available to carry out the intended work.

To train the renovation specialist of the future[30] in all these aspects, an extension of the current training[31] program is necessary. But in order to train new specialists that can carry out the renovations, there needs to be a demand for these renovations in the market. Ultimately it is a vicious circle that needs to be broken and the HUB hopes to offer the first solutions in order to gain success.

In conclusion there is still the 'vicious cycle' dilemma (see figure 27). If there is no deal, there is no business. If there is no business, then there is no trust. If there is no trust, then there is no money. If there is no money, then there is no question. If there is no question, there is no solution. And if there is no solution, there is no deal. And thus we have concluded the circle and are back to no deal. If we can break one aspect, we can make a real change. The risk on finance for the occupant is lowerd by the ETF. The risk on labour is still in place and is a huge barrier in this Save the Homes project.
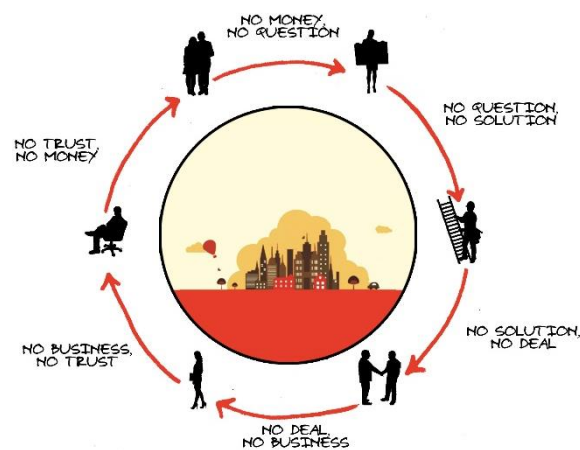
Figure 27: problem of the renovation cycle

[27] Source: https://www.eib.nl/pdf/Verkiezingsprogrammas_tegen_het_licht_-_de_woningmarkt.pdf

[28] Source: https://www.eib.nl/publicaties/verwachtingen-bouwproductie-en-werkgelegenheid-2021/

[29] Source: https://www.ed.nl/eindhoven/verduurzaming-panden-in-de-knel-door-tekort-aan-handjes~a9526824/

[30] Source: https://www.ed.nl/eindhoven/verduurzaming-panden-in-de-knel-door-tekort-aan-handjes~a9526824/

[31] Source: https://www.cirkelstad.nl/wp3/wp-content/uploads/2021/10/TNO-2021-Rapport-Banen-in-beeld-Rotterdamse-energietransitie.pdf

6   Execution

As mentioned before, there are certain risks to the execution of a HUB and the renovation projects of homes. How are we going to link market parties to the HUB? This can be done as mentioned before, by **generating a certain amount of work** for contractors. If a contractor can get work for one project or for one year, the investment in his personnel will be different. New contracts and new ways for working together will be needed in order to ensure a successful scale-up. By ensuring a certain amount of work for the contractor, you can link such market parties to the HUB. For this, it is necessary to know how many homes there are in the neighbourhood to renovate and as such how many "projects" there are likely to be generated. Based on these numbers, an estimation can be made for the number of works and the manual labour needed to finish the projects. This inventory was already done in D2.3 'Citizen Hub protocol for supply side community building and network creation'. For both cities the approach of the execution is different and will be elaborated on in the next two chapters.

When looking at the execution there will be new opportunities. **New business models** and new collaborations between companies. However, this depends on the willingness of companies to act and react on these possibilities. For example looking at the amount of buildings in Valencia (790.000) and Rotterdam (320.000), the fact that (at least in the Netherlands, but possible also in Spain) 90% of the existing homes will still remain in 2050[32], they do not fit the required energy demand, and therefore need at least one renovation. This results in 27.300 renovation a year in Valencia, and 11.000 in Rotterdam. Resulting in 105 (Valencia) / 42 (Rotterdam) buildings a day. This can be a continuous renovation stream, for any contractor.

6.1   Valencia

6.1.1 Research before execution

The research carried out in the Valencia region prior to the start of the Save the Homes project was mainly based on the following points:

- The study of the **housing stock** in the region, considering the volume of dwellings by typology (single-family/ multi-family) and age of the buildings.
- A first survey of the main **retrofitting solutions** - in terms of their degree of awareness among the population or their suitability- according to the typologies previously identified and the age of the buildings.
- The stakeholders involved in the whole retrofitting process:

Figure 28.- Reference building description

---

[32] '#Duurzaam Renoveren', inaugural lecture H. van Nunen Rotterdam University of applied science, 2017.

- o Demand side: main motivations and barriers of potential owners interested in retrofitting their homes.
  - o Supply side: fragmentation and shortcomings of the available professionals when undertaking renovations.
- Main current **barriers** to retrofitting: financing, complexity of permit and grant application processes, complexity of decision-making processes in the case of multi-family buildings.

Figure 29.- Retrofitting solution - change windows

- The number of existing physical retrofit support offices and their location, as well as the services already offered separately (on-line tools for self-diagnosis of home efficiency, energy efficiency advice offered by public services, other useful tools developed in the framework of other European projects, etc.).

Some of the main regulatory documents on retrofitting at both the national and regional levels were also listed.

6.1.2 Services from HUB Valencia

In the Valencia region, the Save the Homes project goes hand in hand with the creation of XALOC[33], a network of local and county housing administrations with the following service units:

- **One-stop shop**.
- Habitat management.
- Housing tenure protection.
- **Retrofitting and energy efficiency**.
- Local Housing Observatory.

Figure 30: Informative leaflet with the services for users of the Valencia region HUB

As for the one-stop shop service, it will focus mainly on **information and advice** throughout the Customer Journey, offering a service to accompany the process that will include support in the processing and management of subsides, among other support measures. This advisory service on retrofitting includes a **catalogue of possible home improvements**, mainly based on energy efficiency

---

[33] *Source : https://calab.es/red-xaloc/*

and aimed at promoting the use of renewable energies. In the city of València, this service will be offered by the València Energy Office.

The Energy Offices drive a "neighborhood in transition" dynamic to support citizens on their way to a new, cleaner, fairer and more democratic energy model. Specifically, four lines of action are implemented to: guarantee the right to energy, promote energy efficiency, boost renewable energies, and develop a culture of transition. In addition to one-to-one appointments and organizing on-demand workshops, each month the Offices offer a training itinerary made up of several workshops to accompany its users step by step in their transition, from saving on their bill to becoming part of an energy community or renovating their home. The creativity and originality of the action lies in its comprehensive perspective and its participatory approach to bring the energy transition to the street and connect with citizens.

Specifically in the field of Energy Saving and Renovation, the Energy Offices give support to homeowners all along the renovation process:

1. **Getting informed**: individual appointments, workshops, information on subsidies, Guide of Domestic Energy Savings.
2. **Designing your renovation**: appointments to explain and preliminary assess different renovation solutions, using RenovEU.
3. **Hiring professionals**: offering official lists of professionals (CHC), guiding homeowners to compare and select the most beneficial offer, assessing them in financing solutions.
4. **Supervising the work**: individual appointments in case needed to solve doubts and avoid conflicts.
5. **Enjoying your new house**: support to measure the savings and improvements achieved, workshops to keep improving, opportunity to showcase your success story.

Moreover, the Energy Offices have launched the Citizens' School for Energy Renovation, which is a citizens' hub where homeowners can exchange their doubts and advice regarding home renovation in a peer-to-peer format, while they get the expert advice from the Offices and professionals of the field.

At both the regional and city level, the main risk for the moment lies in the **neutrality of the HUB** during certain phases of the process. It is key to study how to "recommend" both the companies/professionals carrying out the renovation works and the financial institutions financing them. In this sense, the **incorporation of easily measurable and objective criteria** to be considered when incorporating both stakeholders in the HUB user lists would be the initial measure envisaged to mitigate this risk.   In the next paragraph the process is described, with the risks. In chapter 7 these steps will be evaluated one by one.

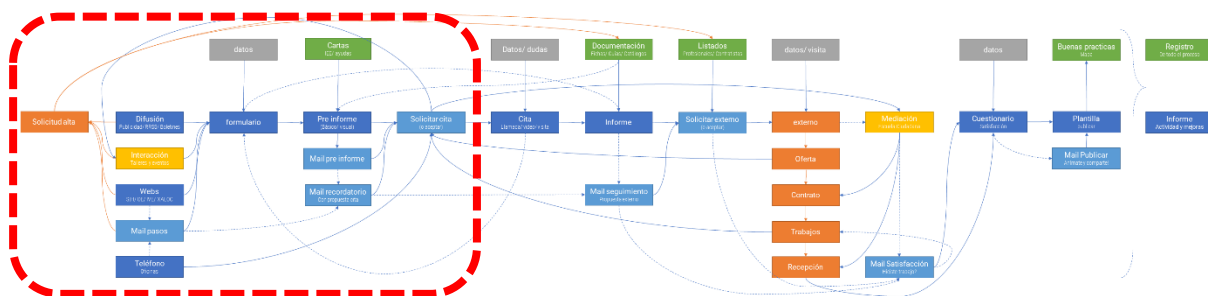## 6.1.3 Route to the market (first round)

Figure 31: Valencia Citizen Hub Functionalities

In this initial phase, which includes the first steps from the information phase, contacting, collecting data and requesting the registration of owners interested in renovating their homes, there are risks

associated to each of the steps that may involve the loss of potential interested owners between each of the stages.
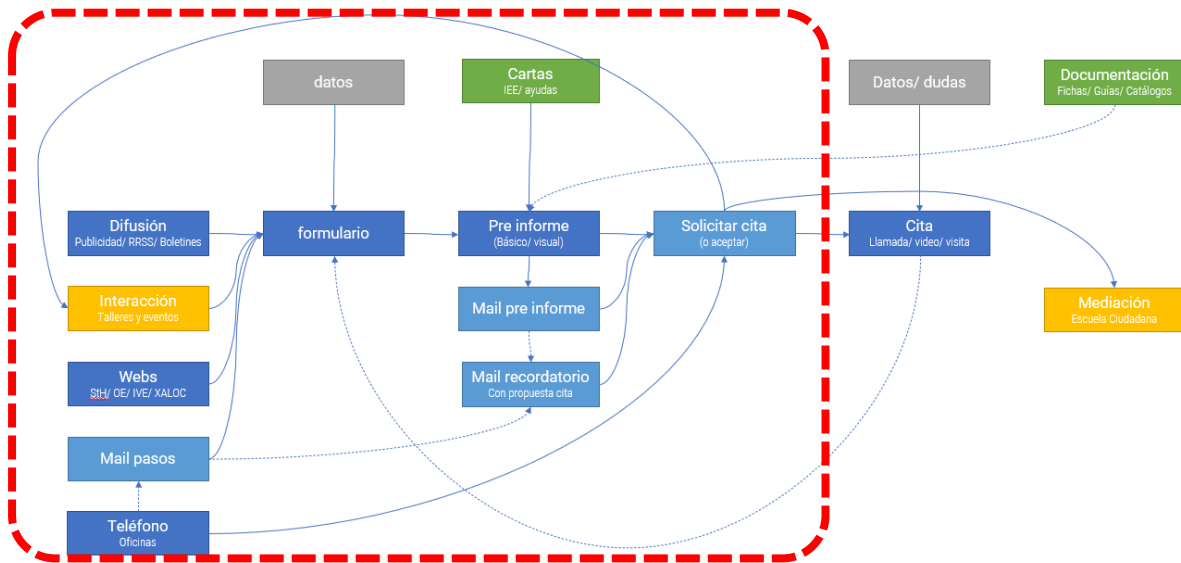

Figure 32: Valencia Citizen Hub Functionalities: first steps

These risks may be associated with the users' perception that the contact with them has been excessively invasive or that the information provided is **overwhelming** in terms of quantity, too technical or too far removed from their needs or not adapted to their personal casuistry. Another risk is the possible perception by users of the insufficient nature of financial information at this stage for decision making (lack of budgetary information on interventions or budget given in excessively wide ranges). The risks associated with decision-making in the case of multi-family buildings are also key, as well as other risks that may arise in the collection of personal data or in the process of registering as users.

6.1.4 Route to realization (first round)
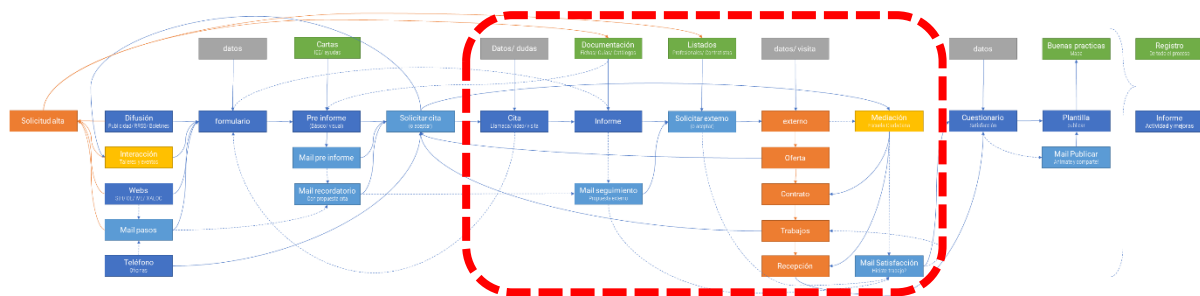
Figure 33: Valencia Citizen Hub Functionalities

Following user data collection and registration, the process includes the request for a meeting and the creation of a report based on the documentation provided by the user and the existing resources available. Based on this report, the owners will be provided with information on professionals/contractors, and the process will be monitored throughout. Mediation support will also be provided if necessary. In this case it is the citizen who takes the initiative
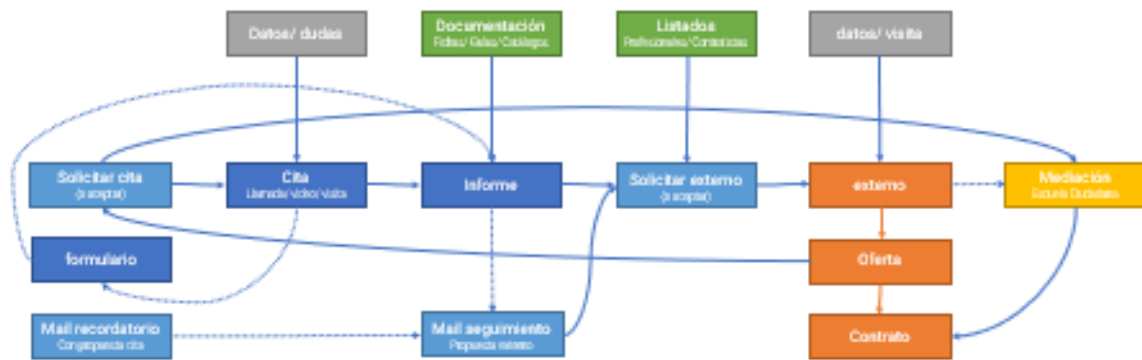
Figure 34: Valencia Citizen Hub Functionalities: execution of works

At this stage, the risks --assuming that the above risks to users have been solved, and that the demand side remains in the process- would be mainly associated to a greater extent with external stakeholders (outside the retrofitting support office itself, i.e. on the supply side). There may be risks associated with the creation of lists of (private) professionals by the (public) office to provide to homeowners. There will also be risks arising from the shortcomings of professionals in the performance of certain tasks, which will eventually have an impact on the quality of the work performed. Problems may arise between professionals and clients, so the role of the office in terms of mediation and conflict resolution between the two parties must be specified in advance.

6.2 Rotterdam

6.2.1 Research before execution

The research done by BouwhulpGroep in Prins Alexander before the start of Save the Homes shows measures that can be taken based on **classification**. It is a matter of choosing how the groups of houses (or the residents of the houses) are approached. Data from the neighborhood (income, interest) can play a role in this, but the ambition of the municipality also plays a role in this. Moreover, the question is what role the municipality wants to take on. If the municipality takes a restrained role, more is expected from the residents themselves, and you have to take this into account when selecting the homes and the areas one approaches. If the municipality wants a progressive and active role, you can work at the lower end of the market, precisely because the municipality is investing extra in this. The **policy** is therefore decisive in this.

Reordering two neighborhoods provides the municipality of Rotterdam with tools to take action. Considering the needs of the national government, municipalities must play a facilitating role. With the results of this analysis, the Municipality of Rotterdam can initiate follow-up activities in the neighborhoods, thereby fulfilling that **facilitating**

Figure 35: reordening Prinsenland - rooftype

role. By arranging the neighborhood in a clear layout, supply and demand can be brought together before actually starting to plan a renovation. But, with respect to the discussion in paragraph 5.2.2. and figure 25, it depends on the position the municipality wants to take. For example in collaboration with Alex Energie specific buildings or areas can be reached.

This research must be seen in the context of the broader sustainability task of Rotterdam. As a follow-up to this research, nine exemplary homes from the Prinsenland, Het Lage Land and Florabuurt districts have been worked on. This is where the step is taken towards the energy performance of a complete home (based on various measures). But because of the repetition, those homes are reduced to components. This enables the municipality to **show residents** what happens to a home when it is improved, but also how those measures can be repeated (at component level). It also acts as an indication of the necessary costs. These examples also show information that can be unlocked by Ikwoon.

Figure 36 Example of the 9 reference types

For Rotterdam, we have a general idea of the execution of the renovations for the area. There is a future wish to make a **longlist** or a shortlist with local market parties in Rotterdam that can execute the work for the renovation process. As part of this project, we looked at local companies for certain parts of the renovation (for example roofs) and which companies in the area are there with the company code "roof" that can handle the renovation. This also resulted in a track that leads people directly to a place where to buy **single measures**, the WoonWijzerWinkel. However, if you have four measures that you want to do, this place will not do so integrally. They will – for each of the four measures – contact a different market party in order to solve the question you posed. And thus, there will be less or no overlap between the measures and no insurance that they fulfill each other's needs. They do not look at the total package. So this is not the track for stacked or integral measures. But for all other solutions, it offers a way to improve your home. It adds to the route A and B.

Different routes

Based on the components, three different routes can be discerned in an area. Route A stands for **individual demand**. This means that every single person goes its own way, and makes a plan for themselves. This allows for tailormade solutions, but is expensive and demanding for the person. Route B is a **collective purchase**, for example of Solar panels , insulation or even heat pumps. It is based on one product, without an integral approach of the quality. It allows for making steps in energy reduction, but it has its limits in ambitions. The **collective development of offer and demand** (route C) uses the repetition of component renovation and allows multiple citizens (not necessarily living next to each other) to form a collective and go through the process of a renovation with integral quality. The pilot in Prins Alexander is an Example of route C, where the initiative was on a small scale, namely the street.
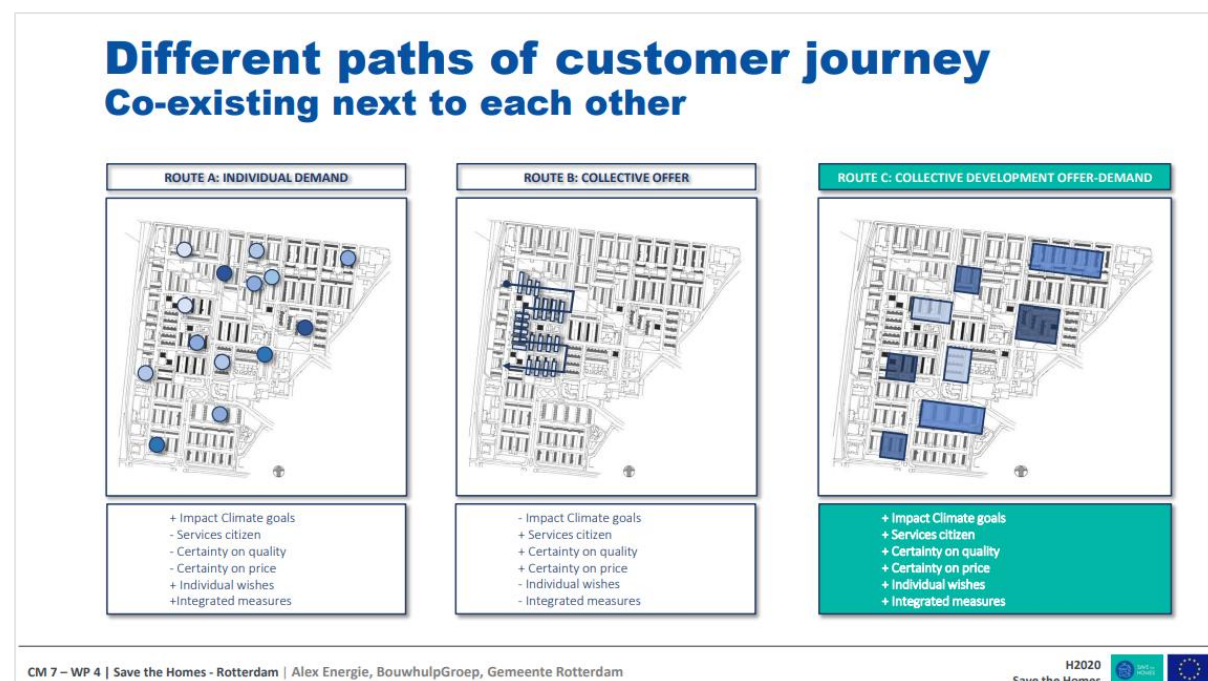

Figure 37 Three paths of operating in a neighbourhood

6.2.2 Services from HUB Alexander

ALEX ENERGIE
- Resident communication
- 'Buurmannen' nearby
- Expert home visits and measurements
- Energy profiles per housing type
- Diagnosis and customization per home
- ...

BOUWHULPGROEP
- Model customer journey
- IkWoon: online renovation plan
- Menu of Solutions: renovation concepts
- Leaflet: program of achievements
- Quality control: quality assessment

GEMEENTE ROTTERDAM
- Facilitator upscaling (Klimaatakkoord)
- Energie Transitiefonds Rotterdam
- Pre-study component families (BHG)
- Benchmark example homes
- Supportpartner Alex Energie
- lessons other programs

GNE FINANCE
- Financing plan per home (back office)
- Support business model HUB Alexander
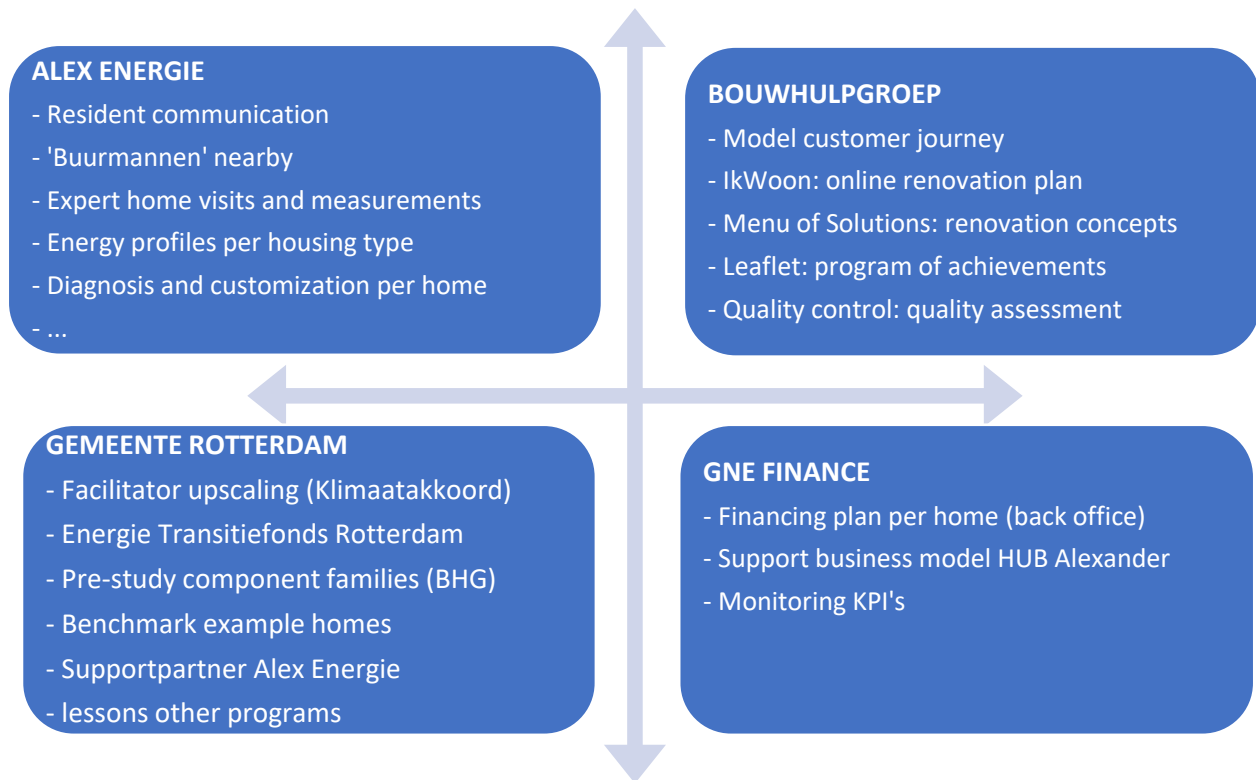- Monitoring KPI's

Figure 38: Services from HUB Alexander, divided by consortium partner

HUB Alexander can offer **several services** for home-owners in order to make their homes more sustainable. Within the Save the Homes project, consortium partners all contribute to the HUB, with a specific task. However it is the question if the HUB is an entity on its own, or can we make use of existing channels.

Alex Energie is the local initiative of home-owners that are willing to take on the challenge of renovating their neighborhood. In this case they look at 16 homes in that neighborhood for the first pilot. They offer services such as communication with residents and talks with other home-owners who have already renovated their homes. Next to being a contact liaison they offer an in-dept overview of the home, done by measuring and visiting the home, looking at the energy profiles and giving a diagnosis custom-made per home, or per cluster. In order to reach climate goals and have already done several projects in the last couple of years, but nothing on a large scale. This set up of the HUB is one they hope to roll out – in time – in the whole of the municipality of Rotterdam, not just Prins Alexander.

Risks for participating in the HUB

The risk here is that the municipality cannot have a preference for a certain market party, as they need to be independent, so their role is more in the background. BouwhulpGroep is an architectural and advise company and offers their services in terms of request and implementation, as this is not something that is part of Save the Homes and is a risk with the plans for the HUB. GNE Finance is responsible for a stable and affordable financing solution in the consortium. They are mapping the existing suitable financing solutions available on a locally, regionally and nationally level (banks, financing companies, subsidies, financial institutions etc.). Then, it continued with the solutions available to municipalities and homeowners with clearly defined financing alternatives to ensure that

customers are properly informed about financing solutions available to them. In the end, the Citizen Hub will act as a single point of contact, with reliable information about the different public funding opportunities, including grants, subsidies, and rebates, where/when the front office will provide advice on available financing tools in accordance with the national financial advisory guidelines. Perhaps even referrals to financing providers that joined the Citizen Hub and can offer analysis on a case by case basis of available subsidies and grants. But for now it is mainly about mapping the financial solutions.

So all functionalities are **potentially in place**, but if they can be provided by the current parties, is questionable.
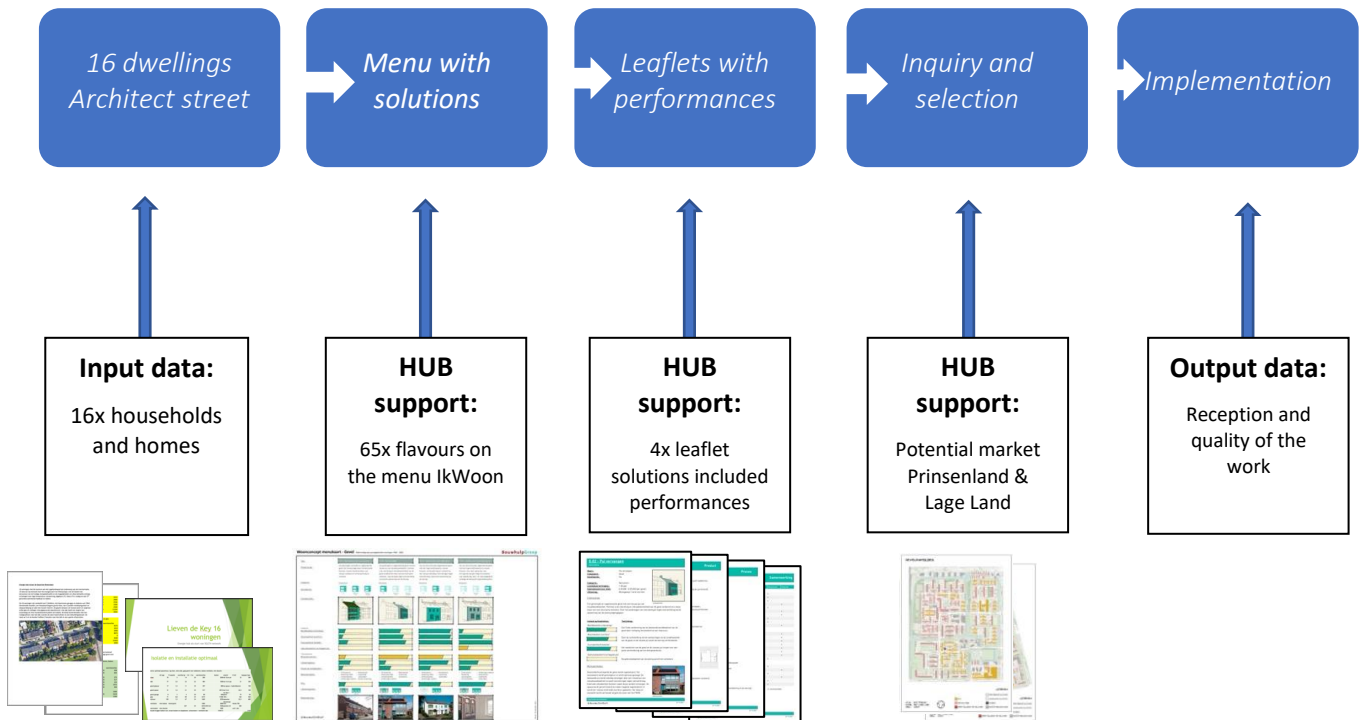
6.2.3 Route to the market (first round)

Figure 39: Route to the market

For the first round – the route to the market, there are still several risks visible where this could go wrong. The first sixteen homes are selected to start the renovation together, as they have the same type of dwelling and could use the same solutions. However, the risk here is that some home-owners may not want to partake in this renovation after all, or if over some time they do not agree with the renovation, and want to quit this process.

In the end, 11 home-owners actual went into the design phase, of which 9 people actual renovated their home. What does the HUB Alexander and Alex Energie do then? Based on the homes in Prins Alexander, BouwhulpGroep together with Alex Energie made a menu of solutions for the area. This menu of solutions contains 65 different solutions, with the possibility for customization where

necessary. The risk here, is to offer such a large amount of solutions, that home-owners do not know where to start anymore. This risk is taken away by Alex Energie, as they offer a selections of these 65 solutions and the home owners are supported in making choices. These offered solutions all pertain to the energy of the homes and insulation of the walls and the roof. In this way, the home-owners will not be overwhelmed by the huge amount of solutions. This pre selection step is also suited bij Ikwoon.

Ikwoon

Because the actual talk with alle household, will take up to an hour, also a digital way to do so was improved. It started with the 30 sec. test, which evolved to Ikwoon V1.0. After that Ikwoon was tested a new version was released V2.0. In this version there are more individually options to choose from. Besides that, the whole app was modernized and a video was added [34]. The risk in using this app lies with the **expectations**. The app informs you, and shows you possibilities. It does not suggest the solution, but it can help making the first choices whether sustainability is of any interest for you. It therefore plays an important role in creating awareness. The updated version of Ikwoon was ready to implement in the next stream of renovation solutions, the Baselbuurt. This stream never has started on the level of a full renovation (like route C). There have been some collective purchase actions (Route B). The **risks of launching** Ikwoon were to extensive, people that wanted to renovate, and not being able to find a contractor would fall out. At a neighborhood of 350 homes , this would be a risk that is too large for Alex Energie, the municipality and the consortium.

The next step would be the inquiry and selection of contractors, which is a larger risk for the HUB as this step is not included in the customer journey of Save the Homes yet. It also lies beyond control of the four parties contributing to the HUB. This is the moment that all work that has been done was an activity of the partners. Now other members are out to play.

The last step is the implementation and for this step there goes the same risk as for the inquiry and selection.

---

[34] https://ikwoon-app.falkor.alcor.cloud/

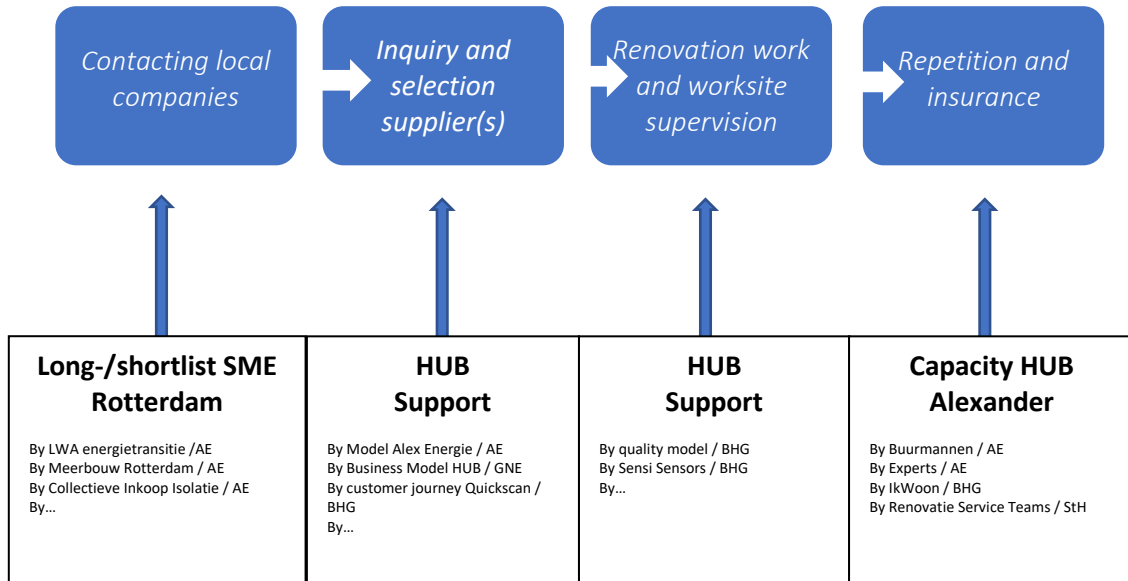## 6.2.4 Route to realization (first round)

Figure 40: Route to realization

Important in the step to realization is contacting the **local companies** needed for the solutions that are offered within Save the Homes. If there are no local companies for certain solutions offered in HUB Alexander, there will be a problem, as the solution cannot be offered anymore. This is a rather large risk, next to the quality of the solution offered by local companies. If there is only one company, how can we ensure that the quality they offer is up to the standard for the HUB Alexander? And how can we enforce quality improvement? Another risk is the inquiry and selection of supplier(s) in Prins Alexander. As mentioned before this step is not included in Save the Homes, and thus also not in the HUB Alexander. But for the future a list of contractors is preferable.

In the first pilot this is the case. The citizens came to a collective plan. This means that several people will do several measures, but not all people will do the same. But, as a whole, it is a large investment of ranging towards €45.000,- per dwelling, which should be of interest for contractors. However, the quotation that was set out to 8 parties, **only gained 1 answer**, and that quotation was much too high.

After a cooling of period solutions were found, such as hiring a **third party** to oversee the execution of the renovation of the homes and dividing the measures into **smaller tasks**. The task snow are being dealt with in a **Building Collective**. But then the integral approach is no longer in place, and quality assurance becomes an issue again. But for the citizens their renovation can go on, which fort hem is the most important. For the pilot realizing this result is needed as well. It shows that it can be one.

This also describes the third step in the route to realization as seen above (figure 41). The need to be sure of the quality delivered. This can be done with the third party hired. However, this third party is only efficient if it pertains a cluster of homes (more than let's say ten homes). And after the first 10 homes stays in the area to do another set of homes. The last part, repetition and insurance, is important in order to scale up the renovation in Prins Alexander. The risk here, is that if the execution of the renovation project did not go according to plan or was cancelled, the scale-up will not be effective or possible at all. It is mainly important to ensure a smooth transition from the inquiry, up until the handover of the final renovated homes to the home-owners.

6.3 Upscaling

The whole idea of Save the Homes project is to create the means to organize a One Stop Shop (OSS) to increase the amount of homes that can be renovated. Therefore it is about upscaling in the city, beyond the pilot and the project, but also about upscaling towards other cities. This part of replication will be discussed in WP 5.

It is good to look at what is in place at this moment. Valencia has the Oficina de l'Energia. It started with one office, but now there are three. This way they can cover a larger part of the region. Besides that a possible cooperation with the Xaloc network of offices was considered. In Rotterdam Alex Energie operates in a specific area, but the results could be replicated. Besides that, there are more energy cooperations active.

In a study[35] by Platform 31 a distinction was made in four types of upscaling. The results of this study were presented during a meeting with Alex Energie and members of Alex Energie.
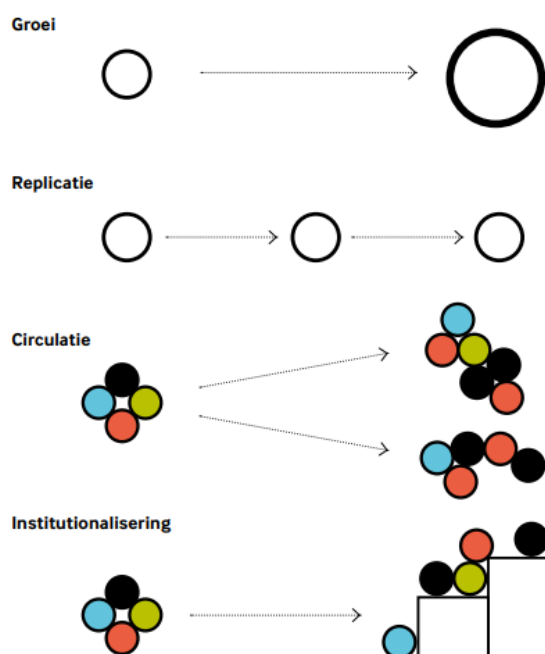
Four different kind of scaling up were mentioned.

- Expansion: getting bigger
- Replication: more copies of the same approach
- Circulation : combining of (a part) of success
- Institutionalising: organising boundaries and eliminating (legal) boundaries to ensure large scale execution

These results look promising, but keep in mind the conclusions by Milin and Bullier that stated that 1:1 replication not always would work, the local context has an influence as well. Perhaps replication works in Valencia, where now multiple offices are active. We saw during our visit as part of the

---

[35] Opschalingsbewust denken en doen Platform 31 W. Kersten – In Dutch

consortium meeting in San Cugat that there an office is active as well, but already has some other aspects than in Valencia.

In Rotterdam, during the presentation the possibilities for upscaling were discussed. Alex Energie indicated that they didn't aim for **expansion**, but that their approach could perhaps be replicated or circulated. However the municipality mentioned that the success of Alex Energie is **connected** to the **area** of Prins Alexander and the people involved. So although the ide could be used, you have to start again from bottom up. What could be possible is to use circulate and even institutionalize to use lessons learned, and put them in protocols that can be used city (or nation) wide.

There is no ultimate model for upscaling, but it depends on the context what will suit best. For now it seems that Valencia is looking for replication. Rotterdam leans towards Circulation, picking the best activities and use them in other areas.

7 Quality control & assurance

The complete customer journey describes all steps necessary for a citizen to renovate a home. In Save the Homes we discerned several steps, and even those steps have been further described. This division in steps helps us to review all actions and possible barriers. However, not all steps need to be addressed as an individual step. Moreover other (follower) cities can choose to put steps together if **local circumstances** influence the outcome, also indicated prior in this deliverable. For the pilots of Valencia and Rotterdam a step-by-step review is performed on the possible risks that could occur, and how to solve them or how to avoid them. Therefore, an extensive overview of the customer journey is given. Also chances and possible solutions are mentioned, because sometimes the Ideas are initiated on one platform and once it is in place, it offers more chances than anticipated up front.
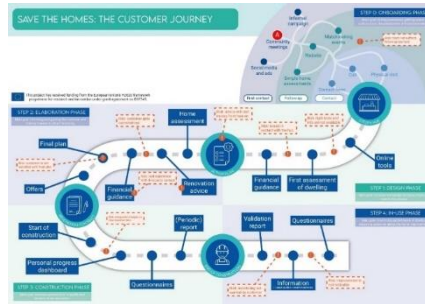
Below is an explanation on the **quality control** and **assurance** of the customer journey for both Rotterdam and Valencia, based on the pilots. In order to make a good comparison, these chapters are not divided between the cities, but are placed next to each other, so that differences and similarities can be seen easily.
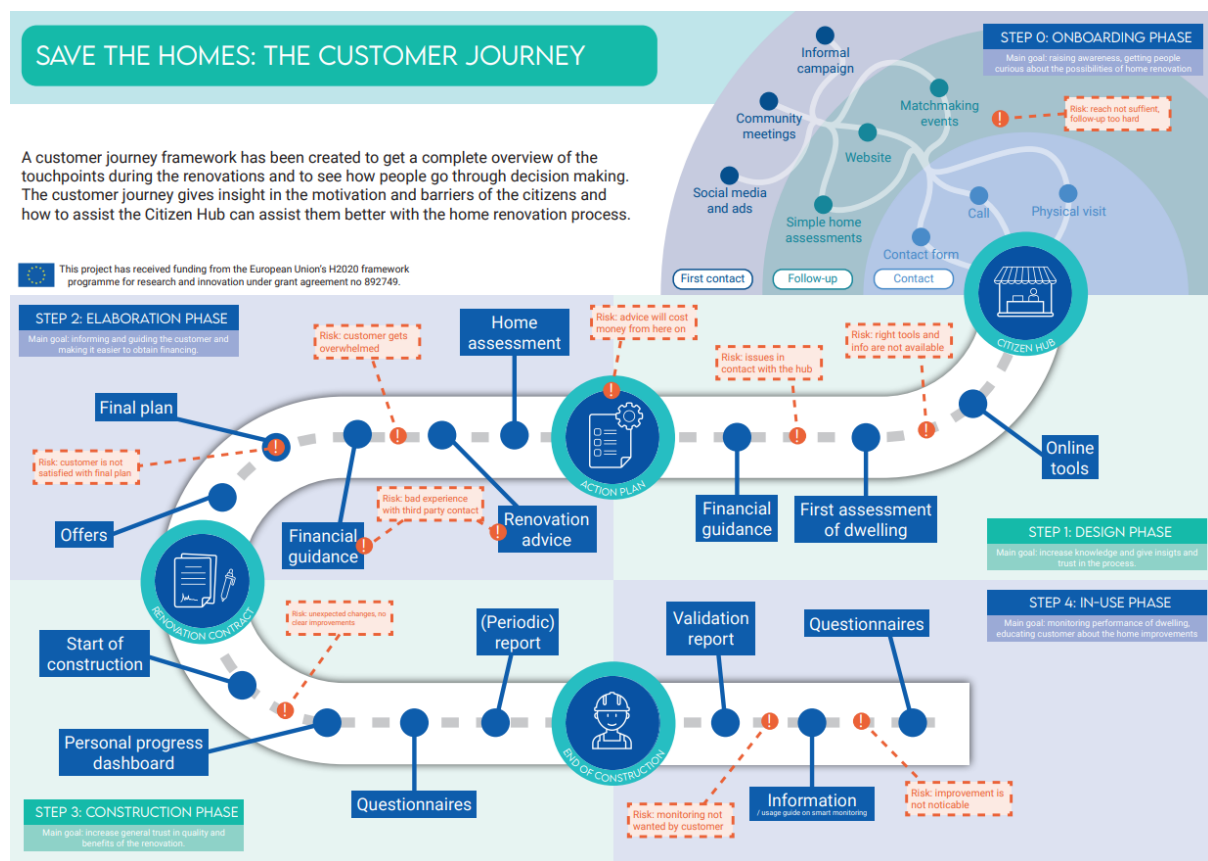
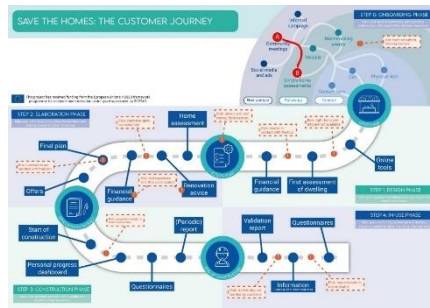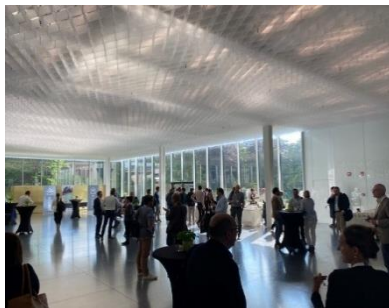In the following 20 steps each part of the customer journey and its barriers are described.

7.1 Step A: Community meetings

This step is about the first contact people have. They are not concerned with energy, energy saving or renovation of their home yet. They are unaware of the need for energy reduction and therefore not interested. But you want to inform them of the possibilities via several ways, like social media campaigns, informal campaigns (folders or advertisement in public areas). Of course has the public opinion on energy saving changed the last two year, this also has an impact on the Save the Homes project. Another place where this awareness can be raised is at community meetings. This kind of communication can be digital or in a physical way where people can walk in or make an appointment.

COMPARISON	
Step 0 - A: community meetings	
Rotterdam	***Valencia***
Building the expertise of the HUB, explorations of a working group in Alex Energie (AE) about making homes energy neutral. The first resident seeks support from the HUB and invites neighbors to participate in a feasibility study into making the block more sustainable.	Space for citizens, personalized advice and workshops for granting right to energy, understanding and optimizing their energy bills, improve efficiency, or introducing renewables
Roles defined: • Energy Cooperation (promotional activities HUB Alexander) • Buurmensen (active volunteers of AE) • App IkWoon (digital tool) • Energy coaches (hired experts) • Municipality of Rotterdam (endorsement)	Roles defined: • Municipality of Valencia (funding) • Valencia Clima y Energia (managing) • Energy Office (operation) • Renovation agents & managers officially registered (collaboration) • Regional government (coordination) • IVE (technical support)

Quality:

- Getting people together is the first step towards a collective
- Starting from what people know and care (their bills)
- Community meetings can inspire the people that attend
- Local actions instead of global actions
- Low threshold to become active.

Risks:

- Sending the right message for the group
- Reluctant citizens can 'hijack' the event with their individual problems
- How to reach the people *after* the early adopters?
- How to become recognised and found by citizens, and seen as thrustworthy?

Chance / solution:

The organiser of the meeting should be an expert on the topic (renovation) as well as on expectation management and guiding a group of persons. This cannot be dealt with just a member or employee, but someone with training and expertise in communication is needed.

7.2 Step B: Simple Home Assessments

After the first contact a follow up is needed. This can be a website with (global) information or even a simple diagnostic tool to explore possibilities for your home. It is not detailed yet, but it shows you the direction you can go. The tool and website are digital ways to do so, but it is also possible to organise events where (groups of) people get information about the possibilities. Still, in this phase people are not aware that they should do something and have no clue whatsoever what to do, nor the budget needed for this.

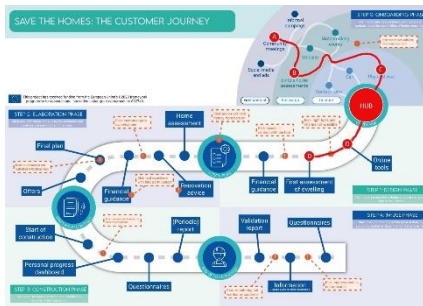| COMPARISON	
Step 0 – B: Simple Home assessment	
Rotterdam	***Valencia***
In the pilot the 16 homes were visited by the 'buurmensen' where some provisional advice was given, with the intent to engage them to take the next step. In the future this can be done in a digital way (Ikwoon), because the 1/1 approach in the pilot is not suitable for upscaling. Exploration by the HUB of the feasibility of low-temperature heating in the block/ neighborhood/district. This is a wish of Alex Energy, but not a condition required for the renovation	Awareness campaigns mostly related to subsidies, websites with OSS services and general advice on energy renovation, and contact info, appointment letters, workshops and pop-ups, al digital available. For example, explaining energy bills, of possibilities to improve your home, all done in the office.
Roles defined: • Energy Cooperation (promotional activities HUB Alexander) • Buurmensen (active volunteers) • App IkWoon (digital tool) • Energy coaches (hired experts)	Roles defined: • Municipality of Valencia (funding) • Valencia Clima y Energia (managing) • Energy Office (operation) • Renovation agents & managers • Regional government (coordination) • IVE (technical support)
Quality: • Bringing renovation steps more towards the individual homes, by using archetype • Creating awareness / liking Risks: • Being too generic, people cannot relate to the example. • Making promises that cannot be met when a thorough home assessment is conducted. This can either be because of technical issues (not possible) or promises based on price and/ or process, that cause people to fall out based on price.	
Chance / solution: Making clear that the first step (0 Onboarding) is about getting *general information* and raising awareness. It is about general advice, with as a result information whether the following renovation steps could be something people are interested in (managing expectations).	

7.3 Step C: Physical Visit
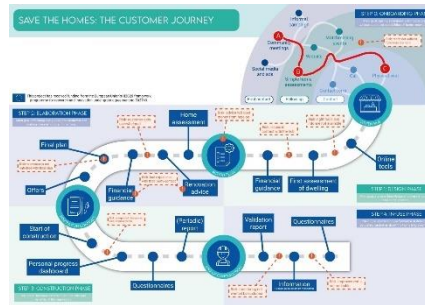
After the follow up, a moment of contact is needed. This can be a contact form where you sign up for a more information or even a trajectory, but a call is also a possibility or a physical visit to explain all further steps. This visit can be a visit to the actual building, but more likely a visit to the HUB (or local office).

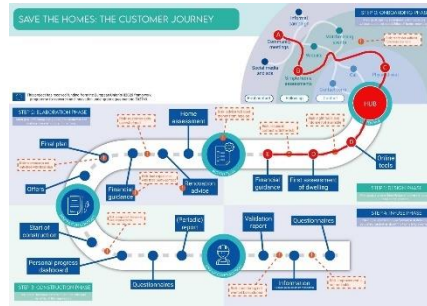| COMPARISON	
Step 0 – C: Physical visit	
Rotterdam	**Valencia**
Recording and analysis of a block of homes by HUB – AE measures homes and calculates energy losses, how to prepare homes for low-temperature heating.	Awareness campaigns mostly related to subsidies, websites with OSS services and general advice on energy renovation, and contact info, appointment letters, workshops and pop-ups.
Indication of possible solutions can be given in a digital way.	Advice on bills and how to save energy and money in their daily life
In the future this detailed information will be part of step 1. For this phase a visit to the home is too early.	
Roles defined: • Energy Cooperation (promotional activities HUB Alexander) • Buurmensen (active volunteers) • App IkWoon (digital tool) • Energy coaches (hired experts)	Roles defined: • Municipality of Valencia (funding) • Valencia Clima y Energia (managing) • Energy Office (operation) • Renovation agents & managers officially registered (collaboration) • Regional government (coordination) • IVE (technical support)
Quality: • First meeting with people in sessions concerning energy (VAL) • Giving people an insight into their energy bill and their energy habits • Preliminary calculations on individual situation (RDAM) Risks: • Knowledge and expertise needed (staff training) • Communication on level of home owner • Time consuming if done in person (i.e. pilot in Rotterdam)	
Chance / solution:	
Informing people of possible choices for their homes.	
By organising the physical visit as a group, more people can be informed at once.	

7.4 Step D: First assessment of the dwelling

After the first phase step, 0: onboarding there is an entity that functions as a starting point. This is called the HUB. It is a place where people can start their customer journey, when they are already onboarded (they know that they want to do something). People that already know that they want to participate can go directly to the HUB, skipping the onboarding phase (0). We now go into the design phase. Although design is perhaps a word that is to definite. A (building) design distinguishes three phases a sketch design, a preliminary design and a definite design. Definite design is Step 2The next few steps are about the sketch and preliminary design. Now more detailed information about the home is needed. Perhaps a viewing of the premises is needed. In the Rotterdam pilot this was already done in (B) but that is too early in an optimal process. In the Valencia case the information is obtained from/with the occupant, during the visit to the energy office.

COMPARISON	
Step 1 – D: First assessment of the dwelling	
Rotterdam	**Valencia**
Global design (by HUB) of solutions for this type of housing – a leaflet is made on how to prepare the house for low temperature heating. Also, a presentation is made to convey the analysis and the plan in understandable language. Leaflets show possibilities in light of the home and the desired quality.	Auto diagnosis online tool and personal appointment and report (both include financial options). IVE has a tool to quickly show basic data http://www.renoveu.five.es/#?welcome
Roles defined: • App IkWoon (digital tool) • Leaflets Bouwhulp (digital tool) • Housing scan advisors • External financial advisor • Action plan via simulation tool (Alex Energie) • Organizing residents' collective (AE & BHG)	Roles defined: • Municipality of Valencia (funding) • Valencia Clima y Energia (managing) • Energy Office (operation) • Renovation agents & managers • Regional government (coordination) • IVE (technical support)
Quality: • Combination of online and personal appointments (VAL) • Financial consequences visible • Leaflet to communicate improvements • Communication based on a collective (10-25 houses) (RDAM) • Ikwoon, digital information on a citizens' level • RenovEU digital information on a professional level Risks: • Overwhelming citizens with non-understandable information • People not willing to go through a HUB (trust-issues) • Tooling or information does not meet the individual house (to generic) • Citizens expectation are to not in line with performances and price	
Chance / solution: This is the first step to inform people of the possibilities, so a wide range can be shown., not all solutions need to be applicable to the specific building, but it shows opportunities.	

7.5 Step E: Financial Guidance

One of the key elements in decision making is finance. This needs to be done on the investment side of the task, as well as on the profit side. So what will the renovation cost, and how much will I save by these measures, and can there be a balance? For a just calculation to obtain the money there is also a cost to take into account (i.e. the costs of a loan). For the citizen the overall decision making will focus on the amount of money needed. Although the mapping in WP2 showed that people are less inclined to commit to a loan, with a solid and trustworthy proposal at least part of the market could be reached.

COMPARISON
Step 1 – E: Financial Guidance

| *Rotterdam*	*Valencia*
Two resident evenings: residents learn about making their homes more sustainable. Residents become part of the HUB official. Several solutions for saving energy are discussed and one has been chosen to research more. This is the last step before they enter a trajectory they pay for. So they must get an offer they cannot refuse.	Auto diagnosis online tool and personal appointment and report (both include financial options) Although finance is important, users of the HUB attended until now have not shown big interest in the topic, probably because of: • Users that come voluntarily to the office are usually the ones that have the budget to renovate their houses. • If they need financing, they go their own bank. • Professionals, contractors and building managers usually collaborate with banks and offer some kind of financing solution for the neighbors that need it. Therefore, nowadays the financing information offered is quite basic.
Roles defined: • App IkWoon (digital tool) • Leaflets Bouwhulp (digital tool) • Housing scan advisors • External financial advisor • Start action plan via simulation tool (Alex Energie) • BouwhulpGroep & Alex Energie (Organizing residents' collective)	Roles defined: • Municipality of Valencia (funding) • Valencia Clima y Energia (managing) • Energy Office (operation) • Renovation agents & managers officially registered (collaboration) • Regional government (coordination) • IVE (technical support)
Quality: • Making an action plan • Financial advice • Being able to discuss the plan within the collective • ETF (Energy Transition Fund) and Warmtefonds are available as a loan (RDM) • Regional subsidies are applicable (VAL)	

Risks:

- Fall out of citizens based on proposition (not suitable)
- Fall out of citizens because a lack of finance (not eligible)
- No time
- No financing experts in the offices' staff
- Homeowners rely on their traditional banks

Chance / solution:

This is the first step to actual inform people of the possibilities, so it has to take them across and go on with the process (like clickbait)
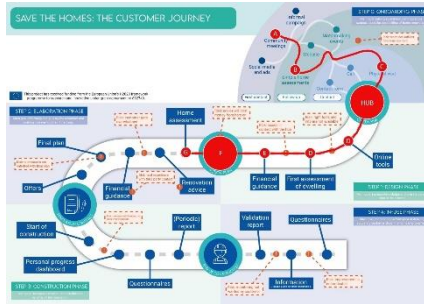
7.6 Step F: Action Plan
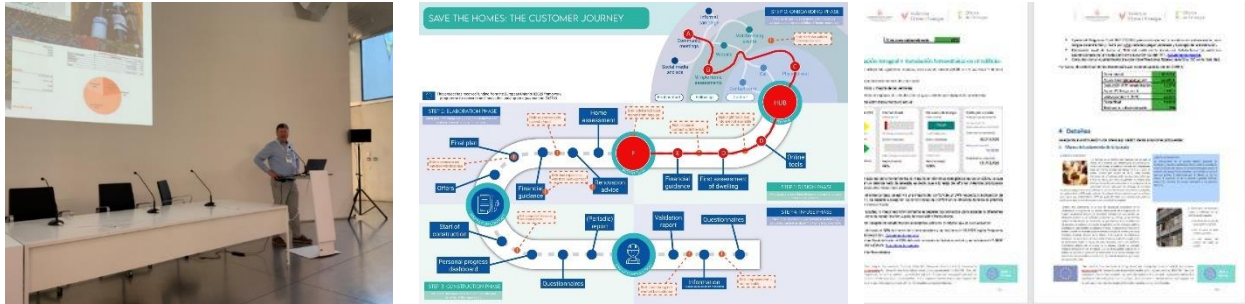
Now an action plan will be made. Until this moment it was about onboarding people and a first (global) design, so you know the possibilities for your dwelling. From this point on, it is getting serious, you actually want to renovate your home. But before this can be done we have to know exactly what is needed. In this phase you still want to choose some details, but in general the sort of measures are known. Because now it comes down to your own home, it is reasonable to ask a fee for the oncoming work. The prior phases were free of charge (until now).

COMPARISON
Step 1- F: Action plan

Rotterdam	*Valencia*
The HUB makes interactive scenario tool for financial projection of costs and benefits per home and business case projections for various scenarios. It should show people what their living costs are and will be in the future	Auto diagnosis online tool and personal appointment and report (both include financial options)
Roles defined: • App IkWoon (digital tool) • Leaflets Bouwhulp (digital tool) • Housing scan advisors • External financial advisor • Start action plan via simulation tool (Alex Energie) • BouwhulpGroep & Alex Energie (Organizing residents' collective)	Roles defined: • Municipality of Valencia (funding) • Valencia Clima y Energia (managing) • Energy Office (operation) • Renovation agents & managers officially registered (collaboration) • Regional government (coordination) • IVE (technical support)

Quality:

• Introducing scenario's for a group of home owners
• Making an action plan
• From customer to client (control, "zeggenschap")

Risks:

• Not willing to pay for services / advice
• The fee can also be paid by a contractor, that will make the plan for you, but then there is no need for a quotation and you lose all the market influences. Currently there are not that many possibilities

Chance / solution:

Making a service that people can choose. From this point on, it is a paid service, so you will get something in return. This is an opportunity for companies. However, the market circumstances are not in favour for such solutions.

7.7 Step G: Home Assessment

Now the trajectory starts where the actual plans are made. Now is the task to select all the ideas and choices from the first part of the journey (leaflets) into a plan. In the Rotterdam case this will be done as a collective, so you have people around you that are going through the same choices. But not all plans have to look the same. Because now the information goes into advise a fee is applicable for the following steps. If people want to proceed they pay a sum as a collective. This fee allows professionals to develop a plan together with the citizens. In Valencia this phase is more an individual search, where a professional needs to help you. This can be a contractor (then you are combining step 2 and step 3), or an architect / consultant who makes a design together with you. The energy office can point you in the right way to one of these professionals therefore there is a list available. This is a regional initiative valid for any municipality in the Valencia Region, therefore, for Valencia too (https://registrochc.five.es/empresas-y-profesionales/)

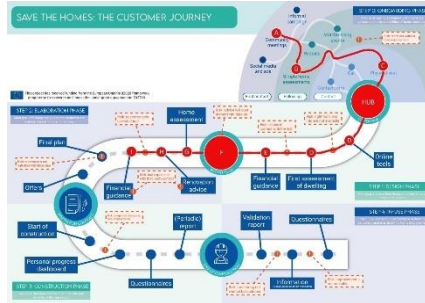| COMPARISON	
Step 2 – G: Home assessment	
Rotterdam	*Valencia*
Financial guidance and decision making for residents – home visits – setting up financial scenarios with the tool together with the resident – results in decision in principle of most residents to participate. Possible using a renovation specialist for coordination of the tasks.	Validated contractors and professionals registry (with training & certification scheme)
Roles defined: • Formalization of residents collective (*no contract form*) • Resident guidance advisor • Prepare roadmap renovation • Result resident specifications • Organizing permit and request	Roles defined: • Municipality of Valencia (funding) • Valencia Clima y Energia (managing) • Energy Office (operation) • Renovation agents & managers officially registered (collaboration) • Regional government (coordination) • IVE (technical support)
Quality: • Getting a first conceptual plan of what will be done in your home • Selecting options that are applicable in your home and tailor made (RDAM) • Validated contractor registry (VAL) • Decision and support group Risks: • Fall out of citizens based on personal proposition (not suitable) • People not willing to pay for advice	
Chance / solution: People actually going on with the plan. The chance lies in people getting involved and active and enthusiastic.	

7.8 Step H: Renovation Advice
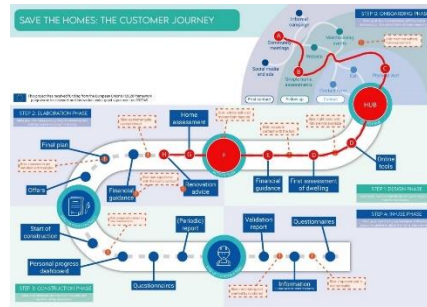
Step 0 and step 1 are all about getting the right information and references. Citizens get an impression of the possibilities of their home and the costs that come with the plan. Now the renovation advice actually goes into your own dwelling. So now it is no longer about a building that looks like your building, but we use information about your dwelling and your energy consumption.

COMPARISON	
Step 2 – H: Renovation advice	
Rotterdam	*Valencia*
3rd residents evening: information to residents about making their homes more sustainable – explanation about heat recovery through balanced ventilation More detailed solutions, discussed by a member of the HUB or an expert	Validated contractors and professionals registry (with training & certification scheme) Support from the Offices' staff to compare the offers received from contractors, to support them in the selection Citizens need to find a contractor to come to this phase
Roles defined: • Formalization of residents collective (*no contract form*) • Resident guidance advisor • Prepare roadmap renovation • Result resident specifications • Organizing permit and request	Roles defined: • Municipality of Valencia (funding) • Valencia Clima y Energia (managing) • Energy Office (operation) • Renovation agents & managers • Regional government (coordination) • IVE (technical support) • contractor
Quality: • Information about specific solutions (technical solutions) • Integral discussion • Validated contractor registry (VAL) • Support in the comparison of contractors' offers Risks: • Fall out of citizens based on personal proposition (not suitable) • Citizens getting overwhelmed • Investment is to high	
Chance / solution: The collective can show different solutions, so if one option does not qualify, other people in the same collective perhaps have other solutions that are attractive. People can learn from each other People can discuss amongst each other	

7.9 Step I: Financial guidance

The plan you make has to be paid for. In this phase the investment needed for the renovation are known. Based on this amount, the owner needs to see how he is going to pay. There are possibilities to get guidance on this topic. Some global information can be given in the Hub. However, if it gets into the personal situation a financial professional should give the advice. i.e. a board or perhaps an independent consultant. In Rotterdam the Energy Transition Fund is in place. In Valencia the owners or the professionals contact with financial entities and can consult any doubt to the Hub. Some contractors already have a financial entity supporting the costs, and some financial entities have their products advertised in the Energy Office (also through the save the Homes financial information brochure). Finally, the list of potential grants supporting energy retrofitting is extense, and a compatibility tool is being developed for improving financial advice from the energy Office.

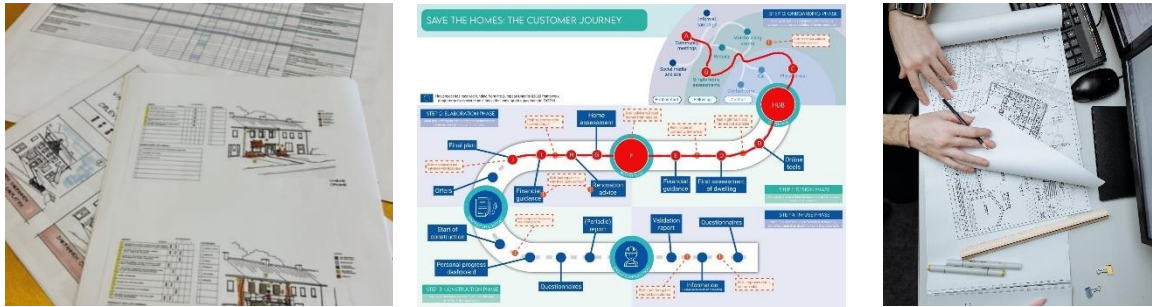| COMPARISON	
Step 2- I: financial guidance	
Rotterdam	**Valencia**
Residents evening: workshop with residents about making their homes more sustainable, there are still doubts about certain solutions and a decision tree about these options and how to choose between them brings clarity and reliefIt is about making ideas final, so financing can be defined.	Validated contractors and professionals registry (with training & certification scheme)
Roles defined: • Formalization of residents collective (*no contract form*) • Resident guidance advisor • Prepare roadmap renovation • Result resident specifications • Organizing permit and request	Roles defined: • Municipality of Valencia (funding) • Valencia Clima y Energia (managing) • Energy Office (operation) • Renovation agents & managers officially registered (collaboration) • Regional government (coordination) • IVE (technical support)
Quality: • Making the plan definitive/final and start route to market • First financial advice • Looking into available subsidies • Validated contractor registry (VAL) Risks: • Last opt-out for citizens • People have done a lot on a technical level and made decisions. Now this part of information and decision making starts all over again, but now on the financial level. People often skip this phase and think is not necessary, but this phase is crucial before going to the market.	

Chance / solution:

It is easier to informal people in a collective of what is in place as financial solutions. For example someone of a bank who informs people. This can also be a financial expert of the HUB.
Individual advice is the responsibility of the individual person.
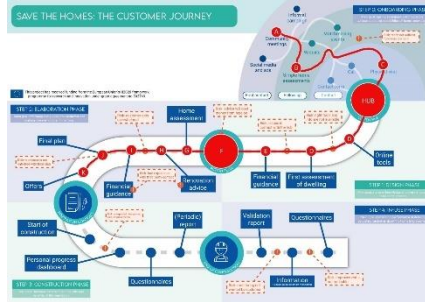
7.10 Step J: Final Plan

Now the final plan is made. The collective has made a plan for all the homes. This does not necessary have to be one plan copied over 25 homes, but he plan can consist of several measures divided over the participants. This is also the last opt out for people. If the plan that is developed is not according to their desire, they can decide to stop and leave the whole trajectory, before a quotation is put out. However the design fee is paid.

In Valencia this route is an individual route. From taking the initiative until the plan and even the quotation, the household makes its own plan. This can also be part of a condominium, in that case, the Hub offers support to the neighbours and/or the condominium manager in their decision-making and convincing all households. In this 'individual' process professional support can be of use, but it is up to the household to employ this professional. This can for example be an architect, a contractor or a building expert. The HUB does not play a role in this part, rather than providing a list of possible contractors.

<table>
<tr><td colspan="2" align="center">**COMPARISON**

Step 2- J : Finall plan</td></tr>
<tr><td align="center">**Rotterdam**</td><td align="center">**Valencia**</td></tr>
<tr><td>Preparation of decision-making about solutions and professional guidance: HUB prepares are selection form where residents can indicate for which sustainability components and options they want a quotation.</td><td>Validated contractors and professionals registry

(with training & certification scheme)</td></tr>
<tr><td>Roles defined:

• Formalization of residents collective (*no contract form*)
• Resident guidance advisor
• Prepare roadmap renovation
• Result resident specifications
• Organizing permit and request</td><td>Roles defined:

• Municipality of Valencia (funding)
• Valencia Clima y Energia (managing)
• Energy Office (operation)
• Renovation agents & managers officially registered (collaboration)
• Regional government (coordination)
• IVE (technical support)</td></tr>
<tr><td colspan="2">Quality:

• Making a client brief with clear specifications that can be set to market
• Based on repeatable product and process for scale-up in the neighbourhood
• Validated contractor registry (VAL)
• Support in the decision-making of the condominium

Risks:

• No regional partner to address
• There is no contract form to legalize the collective
• People often skip this phase and think is not necessary, But this phase is crucial before going to the market.</td></tr>
<tr><td colspan="2">**Chance / solution:**

These plans can be used as example cases.</td></tr>
</table>

7.11 Step K: Offers

In this phase the final plan is set to market with quotations. Ideally this is done within a proven network of contractors. These contractors can be evaluated in the in-use phase, and they can learn from previous projects. For the citizen comparison of price (fair value) is of importance, so multiple quotations will be asked. Perhaps, in the future fixed prices could be used both saving time for contractors and gaining trust by a guaranteed quality and price by the HUB. For now the (Dutch) market is so stressed that no results occur.

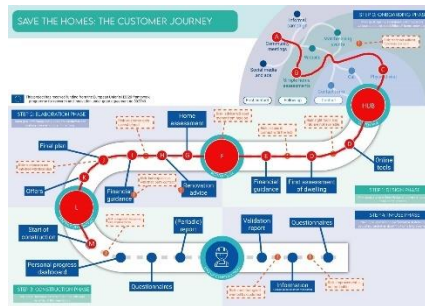| COMPARISON	
Step 2 -K: offers	
Rotterdam	*Valencia*
Resident evening: introduction to a professional supervisor. Residents submit signed selection lists and offer to BHG. 2/3 of the residents of the block participate, all for the complete package. Most of them want the installation. This is triggered by the rising energy prices	Validated contractors and professionals registry (with training & certification scheme)
Roles defined: • Received offers (contractors) • Construction coordination / construction preparation (vacancy construction director) • Start of the building collective initiative (*no contract form*)	Roles defined: • Municipality of Valencia (funding) • Valencia Clima y Energia (managing) • Energy Office (operation) • Renovation agents & managers • Regional government (coordination) • IVE (technical support)
Quality: • Validated contractor registry (VAL) • Set of specifications for contractors (RDAM) Risks: • No local registry • Registry is open to anyone, so no admission rules (because it is a government supported list) (VAL) • Not the right competences / skills • Not interested • No capacity • Price too high for what you expect • Unrest in the collective (bail out)	
Chance / solution: - For the Rotterdam pilot, 8 quotations were asked. Only one came back and was much to high. As a solution separated task were set out to individual workers (ZZP). One coordinator is guiding the work. - This ' Bouwcollectief' has the advantage of providing work to independent contractors. But is cutting up the work, where the initial aim was to go for an integral renovation. This causes a new problem, who is responsible for the overall performance?	

7.12 Step L: Renovation Contract
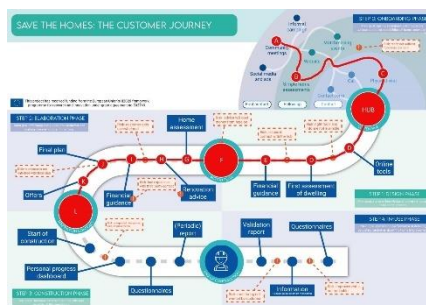
ALV Alex Energie
25 april 2023

The renovation contract is the direct agreement between the citizens and the contractor. From this point on, the HUB only has a role as follower.

COMPARISON
Step 3 -L: Renovation contract

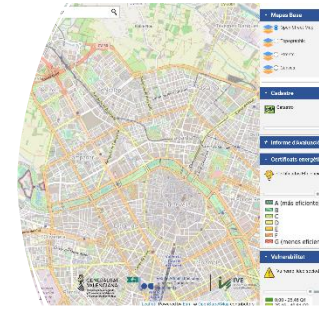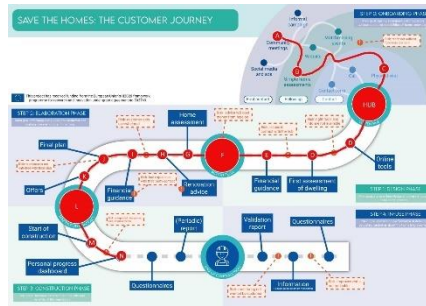| Rotterdam	Valencia
The best quotation will be granted. Each individual will get a contract, because solutions can differ between houses. In the pilot case no fitting offer could be reached. Therefore the 'bouwcollectief' (building collective) was formed. This means that the work is divided into smaller packages, that each have a different party that does the work.	Validated contractors and professionals from the registry (with training & certification scheme) will be approached to conduct the work.
Roles defined: • Received offers (contractors) • Construction coordination / construction preparation (vacancy construction director) • Start of the building collective initiative (*no contract form*)	Roles defined: • Municipality of Valencia (funding) • Valencia Clima y Energia (managing) • Energy Office (operation) • Renovation agents & managers officially registered (collaboration) • Regional government (coordination) • IVE (technical support) • Contractor
Quality: • One process towards an offer to serve multiple homeowners • Pre-defined contracts Risks: • the conditions of the offer are not clear or not accepted • No capacity • Working in a collective leaves a gap in responsibility	
Chance / solution: Drawing up standard conditions for the contract. Especially when this part of the HUB and the contractors are on a list, this can be demanded.	

7.13 Step M: Start of construction

Start of the execution of the work

COMPARISON	
Step 3 – M: Start of construction	
Rotterdam	**Valencia**
Contractor does the work. In the pilot this is done by the 'bouwcollectief'	The contractor is responsible. The HUB can assist in problem solving (explanation, 'mediation'), follow-up calls & questionnaires
Roles defined: • Construction director (vacancy) • Allround carpenter (vacancy) • Allround installer (vacancy) • Several suppliers (vacancy) • Quality assurance (BHG) • Building collective • Transfer & warranty (vacancy construction director)	Roles defined: • Municipality of Valencia (funding) • Valencia Clima y Energia (managing) • Energy Office (operation) • Renovation agents & managers officially registered (collaboration) • Regional government (coordination) • IVE (technical support) • Contractor

Quality:

• Skilled work / Good in one go
• Experience in renovation of private homes

Risks:

• Preparation takes too long (permits etc.)
• No contractor interested
• Materials are unavailable
• Lack of skilled personal (capacity)
• No permits / objections from neighbourhood or clients
• Poorly paid client / poor execution quality
• By dividing the work, the actual total risks cannot be managed, only on a product level.

Chance / solution:
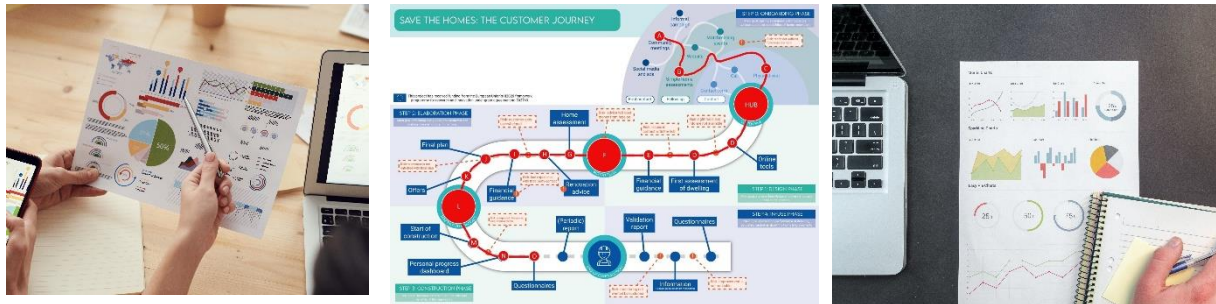
Standard list of companies

7.14 Step N: Personal progress dashboard

For citizens it is good to know what they are up to. Renovating is not their usual work, so they do not know how long it takes or what the activity entitles. Therefore, information is needed. Renovation is all about management of expectations. So it is better to say the work is finished in 8 working days, then we will be ready in probably 6 days. Because in both cases when it takes 7 days, people will be upset that it took longer, but in the other day, people are relieved that the work is done sooner. A personal dashboard will help to manage expectations.

COMPARISON
Step 3 – N: Personal progress dashboard

Rotterdam	*Valencia*
Managing expectations is highly important. This needs to be discussed with the contractor. In the pilot the project leader by Alex Energy, together with the renovation coordinator made a schedule for all measures to be taken and at what day. This is an extra task the coordinator	The contractor is responsible. The HUB can assist in problem solving (explanation, 'mediation'), follow-up calls & questionnaires
Roles defined: • Construction director (vacancy) • Allround carpenter (vacancy) • Allround installer (vacancy) • Several suppliers (vacancy) • Quality assurance (BHG) • Transfer & warranty (vacancy construction director)	Roles defined: • Municipality of Valencia (funding) • Valencia Clima y Energia (managing) • Energy Office (operation) • Renovation agents & managers officially registered (collaboration) • Regional government (coordination) • IVE (technical support)

Quality:

• Making progress visible
• One of the work crew has to know how to talk to owners

Risks:

• Not meeting the planning (meeting expectations)
• Nuisance

Chance / solution:

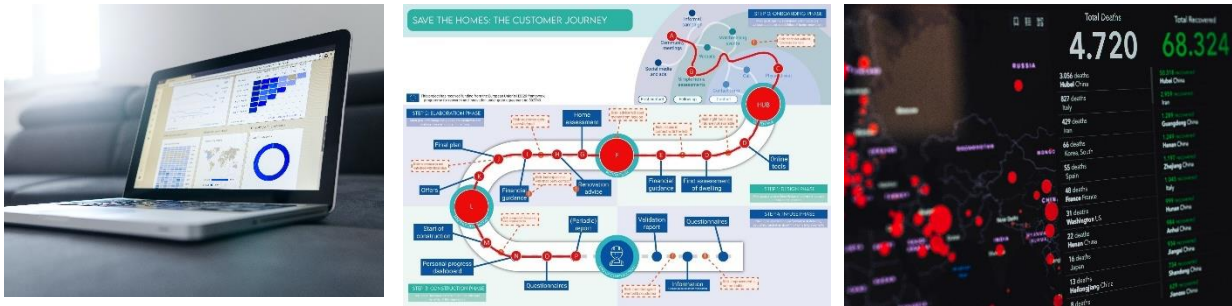Educating work crew in working in existing homes

7.15 Step O: Questionnaires

During the last phase an inquiry can be used to get the opinion of citizens. As a feedback to the process, as a way of quality control and for improvement of the HUB method.

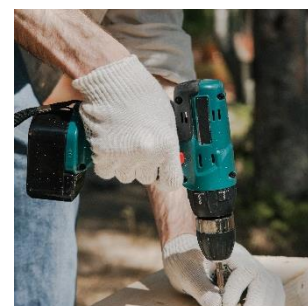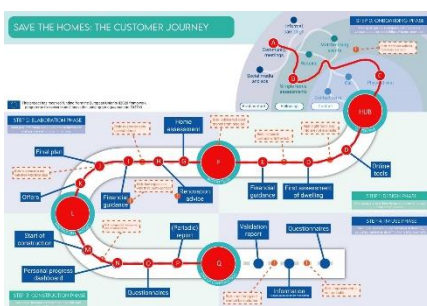| COMPARISON	
Step 3 -O: Questionnaires	
Rotterdam	**Valencia**
The follow up of the results had not yet come to an organised status. When the HUB is producing enough traffic, an enquiry will follow. The pilot project will be evaluated by Alex Energie	The contractor is responsible. The HUB can assist in problem solving (explanation, 'mediation'), follow-up calls & questionnaires
Roles defined: • Alex Energy • Save the Homes Consortium	Roles defined: • Municipality of Valencia (funding) • Valencia Clima y Energia (managing) • Energy Office (operation) • Renovation agents & managers officially registered (collaboration) • Regional government (coordination) • IVE (technical support)
Quality: • Making progress visible • Feedback Risks: • Risk of replication	
Chance / solution: - Building expertise and using feedback	

7.16 Step P: (Periodic) Report

This report focusses on the functionality of the HUB and not rather the individual results. It can be used to monitor the city approach, but does not help individuals. So it is part of the business case and KPI's as discussed in D4.3

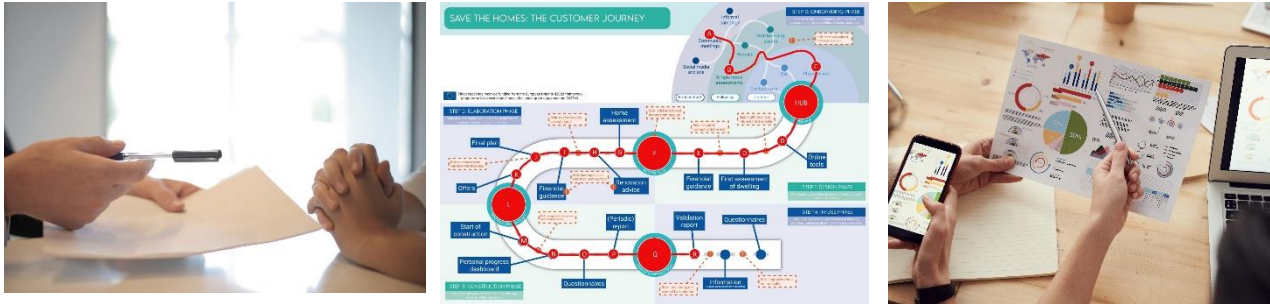| COMPARISON Step 3 – P:	
Rotterdam	**Valencia**
To be continued	As the energy office is paid for by the region, the feedback of numbers is required as a monitoring of results.
Roles defined: • Alex energy • Save the homes consortium	Roles defined: • Municipality of Valencia (funding) • Valencia Clima y Energia (managing) • Energy Office (operation) • Renovation agents & managers officially registered (collaboration) • Regional government (coordination) • IVE (technical support)
Quality: • Keeping track on policy and ambition Risks: • To much effort for gathering data and making reports, reporting becomes an activity on its own.	
Chance / solution: If an up to date status of the city can be generated, you also know what the status is per neighbourhood, and therefore you can intensify actions if needed.	

7.17 Step Q: End of construction

The in Use Phase (step 4) focusses on getting the information of the previous steps back to the front, so we know better to target people, show solutions they actually want a look at how contractors and other participants have acted.

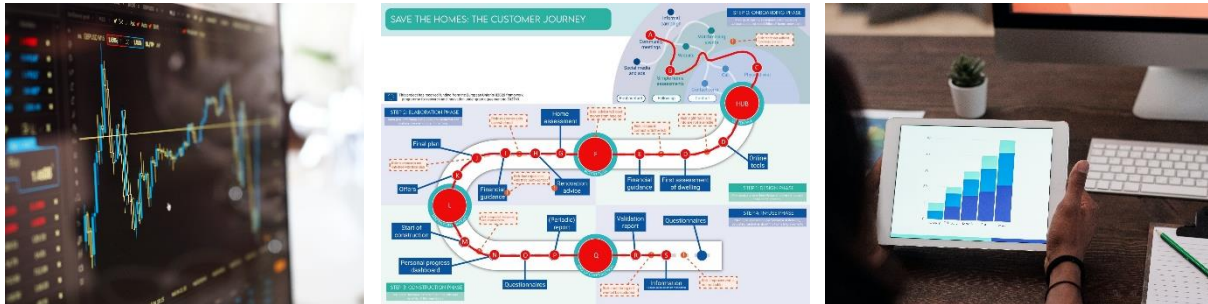| COMPARISON	
Tep 3 – Q: end of construction	
Rotterdam	*Valencia*
After all the work has been done a transfer to the client is needed. In the pilot this has been done by making video's of the situation in the end, and reviewed by an expert (BouwhulpGroep) During work execution the renovation coordinator had a role as supervisor. However, he cannot take responsibility of the whole project.	The owner has to do the transfer and make sure quality assurance is done right.
Roles defined: • BouwhulpGroep • Renovation coordinator • Building collective	Roles defined: • Municipality of Valencia (funding) • Valencia Clima y Energia (managing) • Energy Office (operation) • Renovation agents & managers officially registered (collaboration) • Regional government (coordination) • IVE (technical support)
Quality: • Finished work according to standard of HUB Risks: • Selected the wrong contractor / cannot meet the standards • Bad results reflect on the HUB • No replication examples • Risks occur only later (after the transfer)	
Chance / solution: Improvement of existing processes Predefined quality check, to be used by owners	

7.18 Step R: Validation Report

Each city is working to a specific standard. Whether it is a national standard or just a solution that is good and fits with a lot of houses. These standards offer a starting point for new citizens

COMPARISON
Step 4 – R: Validation

Rotterdam	*Valencia*
How does this project contribute to the city standard	Monitoring report, best practice, satisfaction questionnaire
Roles defined: • Alex Energy • Municipality of Rotterdam	Roles defined: • Municipality of Valencia (funding) • Valencia Clima y Energia (managing) • Energy Office (operation) • Renovation agents & managers officially registered (collaboration) • Regional government (coordination) • IVE (technical support)

Quality: • Validation of the performed work • Guarantee Risks: • Not meeting the specs / high maintenance • No service • Bad results reflect on the HUB
Chance / solution: Ambassador function of houses that are ready.

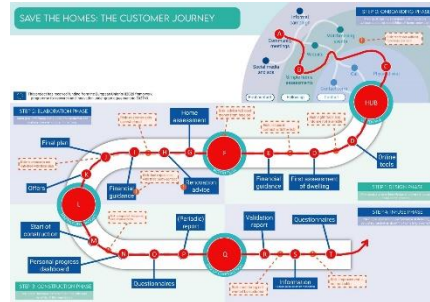## 7.19 Step S: Information/usage guide on smart monitoring

Retrieving all necessary information

<table>
<tr><td colspan="2" align="center">COMPARISON

Step 4 – S: information / usage guide on smart monitoring</td></tr>
<tr><td align="center">Rotterdam</td><td align="center">Valencia</td></tr>
<tr><td>Getting people informed and feedback</td><td>Monitoring report, best practice, satisfaction questionnaire

The Hub in Valencia offers support to measure and analyse the impacts of the renovation, mostly in terms of energy consumption and economic savings. In some cases, small measurement of comfort impacts can also be offered.</td></tr>
<tr><td><u>Roles defined:</u>

• Evaluation product, process and collaboration (</td><td><u>Roles defined:</u>

• Municipality of Valencia (funding)
• Valencia Clima y Energia (managing)
• Energy Office (operation)
• Renovation agents & managers officially registered (collaboration)
• Regional government (coordination)
• IVE (technical support)</td></tr>
<tr><td colspan="2"><u>Quality:</u>

• Monitoring of the renovation

<u>Risks:</u>

• Monitoring shows not the predicted results</td></tr>
<tr><td colspan="2">Chance / solution:

- Education of new measures</td></tr>
</table>

7.20 Step T: Questionnaires

Questionnaires on the whole process. In step O also the possibilities for a questionnaire are mentioned. The difference is that now the whole process is finished. Doing both could be a risk, of people not filling in the questionnaire.

COMPARISON	
Step 4 – T: Questionaires	
Rotterdam	*Valencia*
Getting feedback	Monitoring report, best practice, satisfaction questionnaire Showcasing success cases in the Energy Renovation Citizens' School and in the best practices map, so they inspire others
Roles defined: • Alex energy • Municipality of Rotterdam • Save the homes consortium	Roles defined: • Municipality of Valencia (funding) • Valencia Clima y Energia (managing) • Energy Office (operation) • Renovation agents & managers officially registered (collaboration) • Regional government (coordination) • IVE (technical support)
Quality: • Feedback of results to step 0 onboarding • HUB Risks: • Nort replicable • No response from potential clients • Double with Step O	
Chance / solution: Standard list of companies	

8 Conclusions

It is not as easy to define the roles of what a HUB should be like and how it should function. The actual **context** of the country, municipality and even the local aspects on city and neighbourhood define what citizens need. But in general a HUB needs to satisfy the following:

- It has to give **reliable** information
- **Trust** is the key element
- It should **connect** between owners, organisations and contractors
- It should be a combination between the **digital** platform and a **physical** place to meet
- It should offer **standard** solutions with (later on) the possibility for personal **customization** per house/dwelling typology (development)
- Contractors and suppliers need to be "**seduced**" in order to participate in the Citizen Hub.

During this project **a lot has changed**. We had a Covid crisis, we had economical downfall, and the war in Ukraine caused energy prices to reach gigantic levels. At this moment this is all more stabilizing. However the energy crisis shook a lot of people, and it is not longer taken for granted that we have enough energy or that we can pay for it. Energy redcution is on the radar of more people than before. But actually this makes the value of the Save the Homes project even larger. The more people that are looking for advice and want to improve their homes, the more valuable the outcomes of Save the homes is.

8.1 Valencia

Valencia experience throws a set of lessons learnt in terms of risk assessment and quality assurance in the delivery of an OSS service for energy renovation, strongly based in grant schemes. As a conclusion, Valencia Hub has chosen a set of actions to avoid dropouts and ensure good results on each stage of the customer journey, based on the pilot experience. Among the most important ones:

8) Energy renovation is not the priority for homeowners or occupants, since mediterranean climate in the Valencia area is soft, making comfort a weak trigger for renovation, and energy bills include other concepts, unrelated to consumption, that also make them weak triggers, compared with the high costs of undertaking an energy renovation, even including subsidies (which traditionally end up unspent). Therefore, **including conservation, aesthetic or accessibility renovation works in the grant schemes is capital** to attract citizens to energy renovations. Besides, tackling energy in a holistic way, and starting the conversation from the users' energy bills or their daily habits can attract their interest, provide short-term benefits and savings and, therefore, facilitate next steps towards renovation.

9) The lack of knowledge about solutions is overcome by offering a **small set of solutions** with simple explanations, based on not bothering the home occupant during renovation works (external insulations, PV systems on the common roofs or plug&play new heating/cooling systems), together **with their cost and potential benefits** (including subsidy quantities), **very easily and soon** in the customer journey, from a small set of information, even if information delivered is not the most accurate.

10) Over the policy and IT mechanisms, the role of the **staff** in the Hubs is of key importance, they gain the **trust** of citizens, and grant schemes or IT tools might be perfect, but **human interaction** is what convinces citizens about starting the renovation adventure. In this context, **gathering people and collectives from different experiences** is also a good practice, for human interaction

is the best trigger, also by **imitation**. Therefore, offices need to have cross-sectoral teams covering technical and social fields. Furthermore, promoting **peer-to-peer exchanges and collective activities** among homeowners that want to renovate has proven to be very impactful in their collective learning and empowerment.

11) Driving citizens to **certified professionals** is a good idea, but some work is still needed when renovation works are not big enough for interesting 'big' companies. **Smaller** companies or local craftsmen registries would help smaller condominiums to undertake renovations.

12) **Monitoring campaigns** are hard to plan and perform, but really appeal citizens and reassures owners who performed the renovation, and results can become a good asset to exploit for convincing other citizens. Smaller versions of monitoring are being tested (thermography).

13) **Decision-making processes in multi-family buildings** are still slow, complex and uncertain. Even when highly attractive public subsidies exist, medium and big buildings have proven to be too slow or even unable of reach consensus in order to approve the renovation projects at building level. Offices need to establish direct collaboration with buildings managers and professionals, and need to provide direct services to buildings' communities, in order to accelerate and unblock decision-making.

Maintaining this service and resources, nevertheless, is expensive, and the **free-based service** is costly for the Hub, which depends on the public budget for each year (or set of years), and makes service delivery **uneven in the different municipalities, depending on their capacity to capitalize other source of financing**, such as participating in EU grants or subsidies schemes.

8.2 Rotterdam

In the Rotterdam pilot a lot of lessons were learned, despite they were not always contributing to the final goal.

In the Netherlands (as in the rest of Europe) the One Stop Shop is regarded as one of the most promising solutions for energy reduction. And, when looking at the deliverables in WorkPackage 2 this is true. Being able to inform people in one place of all possibilities, connecting citizens to contractors and people or (digital) tools to guide them through the whole process is what we need. Practice however is **different**. The organisation that is in place to help citizens as well as contractors does not exist. At least, not as an entity. And no one is willing to take the risk or pay for it to fulfil that role. When the first idea of Save the Homes was pitched to municipalities it was about **lack of money** and **lack of labour**. In Rotterdam, with the **ETF loan**, the problem of people not being able to pay for a renovation did become much smaller. The problem about **labour** still has not been solved and is even getting bigger. That adds to the problem that there is no one willing to form a HUB. Contractors have a full portfolio and have no social obligation to do so. Municipalities are supporting citizens, but do not organise **entities** or provide that kind of service in the governmental service. Some municipalities preferred to tender a one -stop - shop (energieloket). In Rotterdam such a energieloket is being tendered. Before the end of 2023 a company or organisation will be commissioned to support any homeowners living in Rotterdam. But the ambition of such a 'energieloket' lies at the lower level (route A an B) and is not aimed at (deep) renovation. So Save the Homes shows that there is indeed the need for a HUB or OSS, or **entity** to connect supply and demand.

1) At the same time it shows that there is a lack of confidence and eagerness to fill in that need. The risks are too high and parties that now act in de building chain are not willing to give up their place in the chain. No one is willing to **put up money upfront**, to form an entity that will enable a OSS. So that also explains why all people that comment on Save the Homes think it is a good idea, but **nobody wants to participate** and take a risk.

2) There are several risks involved in setting up a successful HUB that can be found on different locations. In general, the risks pertain to the overall economy and availability of materials, becoming clear in the price. These aspects are always a risk when starting a renovation, but when during planning, or even execution prices raise, or order periods increase, the outcome is uncertain. And uncertainty is something everybody wants to avoid. Within Save the Homes, we looked for suitable financial solutions for the homeowners in Rotterdam, but because of **uncertainty** of prices people refrain from going along with the renovation proposal.

3) It is important as a HUB to offer stable and reliable solutions for renovations that ensure a certain level of quality, in agreement with what the homeowners had in mind. If this **quality standard** is not met, then the consequences for the HUB can be quite severe, as there will be bad press and less people will want to do renovations through the HUB. Therefore, the start of the HUB must **be good at once**. This is one of the reasons that the onboarding phase was put on hold for a period. When the attention of people is raised, and solutions presented, you have to make sure you can deliver the service within a reasonable period. Because of the lack of labour we were not able to guarantee this. Rather than just promote renovation with citizens, we tried to look for **solutions on more people** for the execution of work, but this lies without the scope of the consortium.

4) Another large risk lies in the scale-up. It makes a difference for a contractor if he has work for one project or work for one year. Clients need to be willing to invest long-term in the solutions offered by the market for renovations. This risk is closely related to the risk of labour. If a contractor can get work for one project or for one year, the investment in his personnel will be different. The simple principle remains that in order to actually save CO_2 in the built environment, people must first actually be available to carry out the intended work, so this is also closely related to the training of staff members. We can reduce the risk by forming production streams in an area. If the contractor knows that there is not 1 home, but the next year he will have one home a week to renovate, he can adjust his work pool to that. With Save the homes, we are still in the one project approach. It needs also alteration in the **policy** that is used to roll out actions. The energy community needs to look at it as **a continuous stream of renovations** and not just a project of 10 homes. But that needs guarantees that the energy community cannot provide. Perhaps the municipality can play a temporary role in it, just to get the HUB started. But eldermen are reluctant to take such a position.

In conclusion there is still the 'vicious cycle' dilemma (see figure 23). If there is no deal, there is no business. If there is no business, then there is no trust. If there is no trust, then there is no money. If there is no money, then there is no question. If there is no question, there is no solution. And if there is no solution, there is no deal. And thus we have concluded the circle and are back to no deal.

Annex 1 – StH Document 1: interviews with partners

Canvic Climatic

Present: Haico van Nunen, Merle Savelsberg, Alejandro

1. What is, according to you, the role of the HUB? (primary function)

The HUB should be like a OSS to assess inform the citizens of Valencia in order to renovate their homes. It should be a place where people can ask their questions and get information on solutions for renovation. It's more about getting informed. This is the case in the model of the office of Valencia. There might be some differences as there are three entities in Valencia, but the idea is that you will go into and get also more information on licenses and subsidies etc. Focus is on spreading information. They are the ones managing the energy office in Valencia. The focus is on renovation and reducing energy poverty.

They are a foundation, but they get their money from the municipality of Valencia.

2. What form goes with this role (physical – digital – hybrid) and to what extent?

It should be a physical place. It can have a digital aspects. There should be a digital platform, where you could help upload information. It could help the physical offices and spread information more widely. Diagnoses tools and subsidy tools would be added to the digital place. But the physical place where you can meet face-to-face remains the most important way to connect and spread information between the home-owners.

3. We try to bring a lot of functionality into the HUB. But what is <u>the most important</u> added value of the HUB?

Subsidies, technical advice and reports are brought in as functionalities of the HUB. But what the most important added value is, he is not sure of. Probably one of the main values of the office is the confidence and the people's trust in the office and in the information that they are getting is fair.

At this moment there is no alternative for getting the information (except for the three entities). They would probably use Google and word-of-mouth from people who have done a renovation. In Rotterdam it is the same, by talking to another and getting some information, but there is no central place where they can get their information and trusted contractors for the renovation.

4. Who owns the HUB, and what role does your organisation have in the HUB? (i.e. who pays for the HUB)

It is the municipality who is funding the organisation. They offer annual plans for the energy office itself. Like the amount of people and number of workshops they need organised. They can share that information with us (annual reports). They reach their goals at the moment, although they are lower than the ones they want to reach with Save the Homes.

If they look towards 2050, it is the plan to have reached all the citizens of Valencia. The initial plan of the city council was to have offices in different districts of the city. So this HUB will be the first one of many to inform citizens. They want to reach everyone and offer this service to everyone, as the demand is quite high. The problem right now is that they cannot process enough and then they do not even take into account the renovation of a home (as they did not take this into account

before Save the Homes) but there is a lot of information on subsidies and energy poverty. The work load is quite high.

How many people are actually taking the next step and doing it? This depends on the outcome, so they do not do the follow-up of everyone that comes. If someone asks for information that is less known then they evaluate. People that actually do the renovation or energy reduces are quite low (actually about 20% they think).

The energy office started operating in 2019, so they worked a little bit more than a year and during COVID, they are actually in their annual plan trying to do an evaluation of their services in 2021. Calling and doing interviews to follow up if people did do what they advised and why they did or did not do it.

5. What kind of solutions (range of solutions) does the HUB offer? Are these solutions already available?

Solutions like solar panels, renovation. The advice depends a lot as there are people that already have an idea of what they want to do. What they try to do is a first analysis where talking with the citizens about what the best solutions are. So they try to give a more complete overview of what citizens can do. The main is to try to electrify the installations, so boilers to heath pumps and so one and they advise in renewables.

How are people reacting? That depends on the numbers, so if they want to spend 1000 euros and you propose to spend 10.000 euros, but if you say that there is a subsidy they are already more willing. It comes to money a lot of times. And sometimes the information is not really wanted. There is people that know the staff and know that the houses are bad, but they do not know where to start. So, then you can really help them. And sometimes it costs more money, but they get a so much better home for it.

People in the office know of technical solutions that make sense and they know about energy solutions and how much these costs and where the subsidies are for. It is the complete picture. And it is not something that we already offer, it is something that they are working on right now. They want to give the full circle of information.

Energy assessment is not something they do right now, but it is something they want to do in the future. Right now it is not an official research, but more question-based.

The solutions they offer, are not products. They tell them what they need and redirect them to contractors for which they have a list and contact information. When people go out of the office, they have a kind of shopping list with what the best solutions are for you and they can contact mentioned contractors to give them their solutions. In the future it can be very closed offers.

Do you think there are contractors in the neighbourhood that can offer this kind of solutions, that the contractor knows will always fit (in technique and solution)? He does not know, that is something they would like to analyse with the suppliers. The most similar thing that has happened for this kind of solutions is with solar panels (in the city of Valencia). But there is no experience with energy efficiency in the city. It will be very important, as you can go a step further than what you are doing now.

6. What parties are missing at the moment to get the HUB up and running? Do you have suggestions who to contact?

Not really, but maybe he is not the right person to see that. Otherwise they would already have contacted them. Basically the energy office works on a connection between the stakeholders related to the energy market. They also try to collaborate with other connections in the work field

(such as the technical university) and also with social entities in the neighbourhoods. They also work with schools and high schools in the neighbourhood. But they should collaborate more with the professionals. They are working on that right now. They are proposing to do that in the upcoming weeks.

7. Are there any functionalities that is not spoken of at the moment, but you think are necessary to create a successful HUB?

We of course need to elaborate on all the things we discuss (technical side and financial side). Everything is a work in progress. One thing is to go to the next step and then start managing subsidies for municipalities etc. Not only on the information, but also a managing OSS for Valencia. But that is not really feasible as the competence is within the municipality for this. There is not really something missing right now.

8. When the StH-project ends, what is the first step to take, to continue the HUB?

They would not really do anything different. At some point he thinks that the public administration has to stop this and the OSS will take off on its own. There has to be a proper demand and supply side for this. Then the OSS would not be needed anymore, as both sides will be able to find each other seamlessly.

Right now, they are promoting collective approaches from the energy office. There will be more OSS in Valencia and more energy initiatives.

Right now there are four HUBs (in preparation or working). How many are necessary? That depend on what is asked. From Europe the OSS is very popular and to use this to promote the renovation wave. It makes sense to make use of the HUB as the medium for the subsidies and renovations. So, a lot more office would be needed.

How many people work there right now in the HUB? In the energy office it is four people right now. In the foundation it is half of them doing the coordination of the work. The four people working are not only focussed on the energy efficiency. One is focussed on energy poverty, one is focused on the social events and things and the other two are focused on energy efficiency and energy renewables. The work field they are covering is more broad than just energy efficiency. They are trying to find the right solutions as well. It is the idea that people will come to the office to ask for these solutions. Ideal is that they give a proven solutions and they implement this in their homes.

They collaborate with social services where people can find the information of the energy office and get into contact with them. You often see that people do not take the next step and they need some help in guiding them.

Extra info:

They really believe in being there for the citizens, to guide them and listen to them, so they do not just have to take a questionnaire. Trust is very important. They really need to speed up the process and standardise this process so they get more people and so that the work they do can be done faster. How much do we have to actually spend on people? At the moment they try to put a limit of 45 minutes as a first assessment. And then they are trying to direct everyone to the workshops, they have every months. Four or five different workshops, one is directly about energy renovations and another one is about renewables and solutions. If they have more questions after this, then they do a conversations.

One thing that is interesting and is starting now is starting a citizen pool of people who will want to use energy solutions. They will share their experiences on their projects, so other people have an idea

of what to expect. This also again to speed up the process and as kind of middle point between a workshop and an interview. Around 15 or 20 people join up to a workshop. Their idea is that this will help them on what they need on information from them. They want to learn from people as well.

ICLEI

Present: Haico van Nunen, Merle Savelsberg, Andreas Jäger

There is no one solution, but rather a modular approach, what kind of different functions could be brought together. This is also important to think of in the replication process (that we think in components).

1. **What is, according to you, the role of the HUB? (primary function)**

From a EU perspective, it is really important to realize the EU renovation wave and increase the energy rates throughout Europe, to decrease carbonization and increase the goals for 2050 for Europe. The local level will be where these goals will be realized, so the HUBS play a very central role in linking these goals to the EU level. That is where the real catalyst will be. The HUBS wil be required to add a first level awareness to be there for citizen advice and then also linked to the funding schemes that are available at the national level.

2. **What form goes with this role (physical – digital – hybrid) and to what extent?**

The ideal situation would be a physical place in conjunction with digital services and tools. Especially when we look at vulnerable groups (such as energy poverty) they cannot use the digital tools, so then a physical HUB would be ideal. Also to go to certain neighbourhoods to get into touch with these people, as they cannot be reached digitally. It needs to be a combination. Perhaps even at district level that you have a focus area for the program (instead of just a city). In smaller cities advice would suffice, in bigger cities there should be a district level. Neighbourhoods vary up to 5000 people. I would say below 50.000 would actually be feasible. A city with for example 600.000 people having one OSS would not be feasible. A very small scale approach is great, but is also associated with funding requirements. It needs to be somewhere in between.

3. **We try to bring a lot of functionality into the HUB. But what is <u>the most important</u> added value of the HUB?**

It depends on what kinds of services it offers. If it gives the possibility of integrated solutions and an integrated approach for buildings and functions as a mediator to cover the general problems in renovating with certain building types, that would be fantastic. It is challenging. But I see potential for these approaches to resolve some of the conflict within such building

Awareness raising is being super important as well as trust building. Independent advice is very important. The renovation market right now is very fragmented and many people get their fingers burned of in the process due to incompetent contractors. So an intermediary that can point you to certified quality contractors will be really key for a fragmented renovation market. Which basically exists across the whole of Europe right now. There is no perfect market yet.

Getting everyone in the right track, but ideally it links to one of the problems of measuring the HUBS. To be able to justify where the money goes. The money that goes into these HUBS it is not always clear where it goes (better control on it). Many of our cities have GHD inventories and decarbonisation ideas and can link it to measured reductions, that would be an important signal and link to local goals and in extension regional and national goals. So the monitoring should be a short and simple advice. An important component that needs to be integrated.

4. **Who owns the HUB, and what role does your organisation have in the HUB? (i.e. who pays for the HUB)**

At the moment the easiest way forwards is to have inhouse HUBS and organise them within the municipalities. The municipalities are not keen on private players to enter the market. The market is not ready for private players. So the easiest way is to form it within the administration. It is associated with negatives as well, because of the stop and go effect. That the funding is provided for three or four years. When a new mayor is selected and there is a shift in policies, it can sometimes stand still or stop. Stable financing is very important, ICLEI is pushing for this within the renovation HUBS. At the moment all the money is flowing to national level based on strategies. And then they are devided between the regional places. We are worried that the money will not add to the funds, but will replace the existing funds and that the actual money for the renovation sector will be used for other things (They have Elena funding here, with three years and one year possibility of extending). After three years you can see the take off. You need something with continuity. Continuous funding is very important.

5. What kind of solutions (range of solutions) does the HUB offer? Are these solutions already available?

The questions asked to ICLEI is all about funding. A lot of cities have real technical capacity and real understanding of the local conditions. Sometimes there is very little we can offer them on technical knowledge. Their main issue is to really secure the funds to operate. What we are doing quite often is exchanging facilities between these people. They link cities up, that have experience and they can exchange and discuss their solutions and best practices. Also working with Elena and working within the Horizon projects. Those are the main leverage points that they have at the moment. Something that we haven't done much but should do more, how we can take the weight of the shoulders of local authorities on some services that could be put into the regional or national level. The first step on thinking what you want to renovate could be done at a higher level, instead of by local government to reinvent websites and tools to do this. Local you can work with clients that are thinking further along and are already specifically looking for something.

It depends on the member state context, where we don't have a local level. In other context you actually have very powerful regions that have their own funding programs. At the EU level you could probably not provide the information for funding as some areas are very specific, unless it is very well maintained. So, the regional level is perhaps more the focus (ICLEI).

When we look at replication, we look at components, the legal structures, the contractor list and the financing (really specific topics). There we can gain interest from the work field. It would be a good opener to engage the right people. To be very clear about the value added in taking part in workshops that are not linked to funding. We are just talking and they do not have time to talk. Priority is to deliver services to the local area. If it becomes to abstract, they will drop out. We will see how things go. It will be a challenge. Already in the process of setting up a network (not only from ICLEI, they work at the higher level) but at the expert level that are working in the renovation sector and are not political leaders.

6. What parties are missing at the moment to get the HUB up and running? Do you have suggestions who to contact?

Marketing is a huge part of the OSS. Many of the parties have a dedicated marketing specialist, that know what ways of communication are the best for the different groups. That is something that could be brought in. I also think that our connection to the local level is maybe a bit weak. They have academic and private sector representation, but on the ground, in terms of organisations that can deliver and engage in the local level, that is not there. They are setting up a framework, but how it then connects to the local level, is not in their hands. They would like someone on the ground that can the theoretical construct to the people that use the services.

Should this be more on the technical side, an intermediary or the function of the NGO? I saw it more from the non-technical side. On the technical side, depends on national context, in Germany there is a very good system of energy advisors and heavily subsidized and they go into homes and talk to people and make the first link on what kind of solutions are very attractive for them. It is a system that works very well. Energy advisors would also be great in the STH project. To get across the threshold. It is a lot of manpower this way. There should be a way to inform people without this kinds of hours (mix to inform people and really talk to people and that is very difficult right now). Realistically you cannot send advisors to every apartment. Focus should be on different approaches that work in parallel to inform the population. Lot of potential to look at the typologies of buildings and prefabrication. There are still a lot of issues of high-upfront costs and that scares people of. There needs to be a general advice on the neighbourhood level, dependent on the type of building (like the age when they were built) and link this to attractive funding. There the local level can also provide more information, to get into talking with banks for funding and contractors for good quality renovations. Not one way to do this. It needs to be a portfolio of strategies that are complimentary.

7. Are there any functionalities that is not spoken of at the moment, but you think are necessary to create a successful HUB?

If it was up to me, we would have established such HUBS in all the local areas, or perhaps in rural areas town will share such a HUB. The aggregation of local authorities applying for funds together. They are established, up and running and have a long term security of operation. By dedicated funding pods. To have them be established and stay established and not worried about what happens in four years. This will be linked to awareness raising and dissemination. More an advisory HUB for funding opportunities. Enablers to get the market going. Once there is market maturity then I hope the market players will enter. It is critical that we avoid the upfront costs and tenant problems. We set the conditions for the private sector to take over. We need to create the preconditions for the market to function. It is really important to take of the capacity building and creating a market where it does not yet exist. To gain experience. There needs to be skills development. This needs to be also happening. Not sure if that is needed within the context of the OSS. But the national and regional level need to design these training (also linked to the EU). It could then be implemented within the local level (or city administration). The supply side needs to be enabled and the demand side needs to be activated and then hopefully it will create the basis for it to take its own form and become a dynamic renovation HUB. This approach would be better as the supply side does not take of in some cities (they look at each other).

Schemes need to reflect the local conditions (it is very different between countries and areas). The national levels understand the conditions and could develop the framing and certifications. National funding grants will be assessable to contractors that are qualified. These kind of things need to be developed at the national level and integrated in the local level. At STH we need to be a more assertive.

8. When the StH-project ends, what is the first step to take, to continue the HUB?

There should be someone that can prolong the renovation wave throughout Europe (and the HUB in the city). The national level has the potential to really push the OSS concept and provide technical assistance in setting this up. The national level understands the policies and set-up. The member states themselves are very well placed to provide legal advice and funding landscape for these OSS. So, there needs to be a service centre at national level for the OSS. Ideally we would need some kind of pot that can be activated be the local authorities. On paper the long term strategies for renovation are great, in reality (especially eastern EU) there was not a lot of talk of what was going on at the subnational level. So where these billions of euros are going, I am a bit

worried and think that this could actually be an issue and therefore having money at the EU level, where the local authority can get to without going to the national level, would be really adding value. This needs to be continuous instead of just four years.

IVE

Present: Haico van Nunen, Merle Savelsberg, Ana Sanchis

1. What is, according to you, the role of the HUB? (primary function)

The basic role of the HUB is to give reliable information, because when you face a renovation, you really do not know where to look for budget, materials, solutions and subsidies. Everything is very scattered. The main goal is have somewhere to go and get information about the whole process. Because it is very complex, as it involves many different actors and different solutions.

If they want to focus on extra things next to the renovation, it is extra effort. The office should give the information and take into account those kinds of things from the beginning. The HUB should have the offers, to think more integrally about the renovation of the home. That is an extra service that the HUB adds for the customers.

Ana mentioned that when talking with Alejandro, he said people ask for the roof but they also go with more general questions. So, they have like five branches of information, where customers can already sort for themselves why they want to do a renovation (money, energy, health etc.). The office has information on with what kind of questions people come to the office. Ana will send an email with this information.

2. What form goes with this role (physical – digital – hybrid) and to what extent?

They have a double vision. The office, who depends on the municipality, wants to be a physical office. From the point of view of the regional office, it is important that in the main cities there is a physical HUB, but as you cannot reach everyone this way, there also needs to be a digital office.

The customization would be done in the physical office, as there is a staff working there. The digital office will be maintained regularly, but it is not sure if someone will be able the work behind the screens all the time.

If you want to have an idea of the costs of some measures or possibilities, online is a good solution. But when you want to do something specifically for your home, you have to come to the physical HUB.

The digital HUB is an excellent opportunity to get into contact with customers and get their attention. Here it is possible to ask people if they want to participate in the renovation, when the online advice is given. Through this way the customers can also directly come into contact with the municipality.

The HUB can also only refer you to a contractor, if you already know exactly what you want. So they connect you with the company you need for your renovation.

3. We try to bring a lot of functionality into the HUB. But what is <u>the most important</u> added value of the HUB?

It should be trust. The customer needs be certain that they give a proper solution and have proper contractors. The whole combination, everything you find in the HUB should be trustworthy.

4. Who owns the HUB, and what role does your organisation have in the HUB? (i.e. who pays for the HUB)

In Spain, the competence for ruling the housing, is on the region. The direct application of those rules is in the cities. But sometimes the cities do not act properly on certain rules, as they say that

those rules are something for the region to implement. There is a disconnect between the two organisations. IVE is trying to get the region to offer money and solutions (training and resources) to open these HUBs and for different activities. The HUB depends on the municipality, but it is also dependent on the resources of the region.

They are very dependable on how the municipality reacts to the HUB. Valencia is not yet part of the current existing network. For the moment they are working in parallel. Hopefully they will merge at some point. The cities are free to implement whatever they want. Most subsidies however come from the region. When the municipality get funded for opening a HUB, it comes with a long list of requirements to fulfil in order to get support. They have to comply with the requirements. In November five pilots of the HUB will be opening.

They are doing that now because it was already part of the plans of IVE. They felt they were not getting to the right customers. Now, they can take advantage thanks to the Save the Homes project, to launch it altogether. It is a nice coincidence to collaborate on it. (This would still be happening without the Save the Homes project).

The role that IVE has, is the technical part and backend. How to communicate and explain the benefits. They see their role fitting the mindset for the HUB. The front office should be managed by the municipality. Local architects will be used for the HUB. The people that work in the office of the HUB are probably going to be contracted by public budget. Different kind of people will work there (technical, financial etc.). It can also be civil servants.

5. What kind of solutions (range of solutions) does the HUB offer? Are these solutions already available?

Trying to start with standard solutions. Right now, IVE is focussing on the energy part and behaviour towards energy improvement. In the beginning they are going to focus a lot on the subsidies that are already in place. Like, for instance, the changing of windows as they are really bad. There is also a lot of grants for changing the heating systems such as boilers and energy renewables.

Their intention is to use existing researches and standard reports people are already getting from them. Next to the report, customers could get a standard offer with their report. An advice is given, but not a real solution. For the moment it can be seen as a warning for what to do with the home.

Subsidies and product improvement are the first steps. Wishes include also facades and roofs. Other solutions and options are not important for now. In order to be ready for 2050, they would also need to include solar panels (so renewable energy sources).

For the moment IVE is very active on reviewing the energy bills. They are also very active in recommending behavioural change. There are also surveys they use right now in order to help customers. The interesting part is that these factsheets were very easily read and understood by the customers.

The actual changes are in the advice. The office is running for contractors. They are asking for legal requirements etc, so there will be list of what contractors are suitable. In this way they are able to show what they are capable of. The region and municipality are currently using different methods of finding suitable contractors. They have to find a connection point between the municipality and the region in order to merge this into one. The registry of contracts is not in place yet. It should be on short term (like weeks or months). For the financial side, it will take longer.

For the moment the contractor or designer will need to adapt solutions to the specific building. The long term solution is to offer inclusive options, where for different types of buildings there are possibilities. But this will not be ready by the end of the project.

They want to do a follow-up of the works done, or project delivered, so they can control the quality. Think of surveys or follow-up calls to see how the renovation has been done. They can do it now, because there are not so many people going to the office, but if it is a success, then there will be a different solution needed.

Right now, they have three people at the office who are delivering the service of the HUB. There is a limit to what is possible for them. The digital HUB could take a bit of the load for the physical HUB. The physical HUB can help people who actually need it.

6. What parties are missing at the moment to get the HUB up and running? Do you have suggestions who to contact?

From their side, there is a lot of work to be done with the suppliers. They have not really started digging on that part. They have a lot of ideas of what to do with them, but they have not yet discussed it. It is for suppliers on solutions and building materials.

There is a list for contractors, but IVE has not yet seen it. For the moment they have launched the registry with their own means. So perhaps they have not been able to get that many contractors to add themselves to the list.

They also cannot offer all solutions if they do not know what the contractors can deliver as solutions to the customer. They are looking at what is being developed at this moment, to see if there is a better way to offer solutions. They do not want to have sponsor solutions in official factsheets, but the office can have a lot of publicity if they want to help with this. You can have a preferred partner to work at your place.

The municipality cannot put one contractor before the other (in Rotterdam), how is that done in Spain? They have done it together with a legal department, so there are mandatory requirements in order to get on the list. Next to that, there are voluntary requirements. The list is open to everyone. You are not on the list if you do not fulfil the requirements or if you do not want to. If you want to participate, it is up to you.

The customer orders the list of contractors by how they want it, or in alphabetical order. As a contractor, if you are called once and have done a renovation, then you go down on the list and the next one is up for renovation. In this way, everyone gets a fair chance to do a renovation through means of the HUB.

7. Are there any functionalities that is not spoken of at the moment, but you think are necessary to create a successful HUB?

It would be nice if the HUB can add the customised project. But IVE does not think it is feasible at the moment for the Save the Homes project. More a one-stop-shop where you get the complete overview of the solutions on paper and you can go to a contractor that will do it for you. It does not have to be for free, it could be paid for. They, however, do not think that people are willing to pay for the advice provided by the HUB. They are going to act like a glue in order to connect the different actors. Maybe they can charge a fee for the customer if they apply for a fee for them. But, for public service, they will not pay.

The physical HUB is seen a public service by the people. It all comes back to trust. A municipality office will give trusted advice, that you will take to a contractor or architect that will work it out

for you. You can better ask the contractor for the exact solutions as they will also see the home that needs to be renovated. The purpose of the HUB is a better informed customer.

8. When the StH-project ends, what is the first step to take, to continue the HUB?

In this case, the HUBs are already running on a municipality based funding (and region). They depend on public budget, so these HUBs will work beyond the Save the Homes project. If they have an environmental function on the city, they will be viable after the projects ends. They will also have enough clients, as it is a public office. The last phase of the customer journey they would also like to get them involved in the diagnoses of renovations done to see if the energy bill is lower and the comfort is better etc. Also, they can do something if there is a lot of negative feedback.

GNE

Present: Haico van Nunen, Merle Savelsberg, Kristina Klimovich, Mart Jacobs

1. What is, according to you, the role of the HUB? (primary function)

KK: Technical assistance, financing and using some form of smart funding. The HUB should provide technical support, give people advice and administrative support. Financing report can be direct or can be something to clear on the different aspects. Also to get grants and subsidies. Towards the professionals the HUB can provide them with new projects. The HUB can bring them together and connect the two communities.

MJ: the main focus should be to get the people engaged in the one-stop-shop and how to get people to go there. You need to think about the practical side of things as well in order to lower the boundaries as much as possible.

What is the value of information they get over there?

KK: we should give real solutions. But we also are trying to figure out what the cities want. GNE offers a full service. They have architects that work in specific fields needed for the projects etc. They adjust programs to the needs that they observe of the users. It should maximise the probability that the user will renovate his/her home well. Right now, we are not getting in the renovation wave, so we need to do more, in order to get entry into the business of the municipality. So that we get more involved in the renovation phase.

HvN: GNE would like to have the whole package, but if the parties we are working with, are more aiming at parts of that track, it is also a possibility.

2. What form goes with this role (physical – digital – hybrid) and to what extent?

KK: they follow what the cities think is feasible and practicable. But they prefer a clear website, where they can find information and schedule an appointment to get more information. Via this website, you could also link digitally with contractors or doctors for renovations. But at this point, it is the question if cities can realise that. So, a physical HUB is necessary.

MJ: agrees with KK. Also word of mouth is very important, especially in the beginning when it is very unknown.

Option of Rotterdam: digital information platform and in real-life more information.

MJ: Yes, it would be ideal. But, the strategy of Rotterdam is also very suitable for where they are in the renovation process. When looking at Valencia, it is less suitable to do this digitally. There should probably be a different approach for each city.

KK: expecting that there will be too much traffic, then there is a lot of expectation. You need to sell to get traffic, so that should not be a concern. But there is the question of how much advice you give for free. You need to discuss this. Valencia it is a must to give this for free. Rotterdam needs to think more about this, they only think a bit ad hoc about this. But perhaps we should ask someone specialised in this, to give advice on how to do/approach this. The goal is not to make the city program the best, but to get people to renovate. They should bring people in touch with the right source of information. It should be good advice, that does not go into the technical part too much and then connect them with the right divisions. This is also a way to give contractors more leads for renovation.

HVN: Rotterdam are looking at what their role should be and what they can do, without stepping in the free market, perhaps they are too shy and they need to do some experiments on where the border lies. They do not follow a strategic way. It should be that that border is clear to them and the follower cities as a result of this project.

KK: Example of the belastingdienst. Like, to help on the phone on how, but you still need to do it yourself. The service of the HUB should be like this and respectively the role of Rotterdam as well. The city can give a transparency process that helps their citizens and puts them on the right track with the right contractors.

3. **We try to bring a lot of functionality into the HUB. But what is the most important added value of the HUB?**

KK: Transparency and ensure simple explanations. It should be easily explained to customers that do not know anything from the outside. Demystifying the process is very important, so it is clear to everyone what is happening and why we are doing these things.

4. **Who owns the HUB, and what role does your organisation have in the HUB? (i.e. who pays for the HUB)**

KK: In the beginning the municipality. They should get three people or something for the first year and train them and then review if everything works, if there is not too much demand or too little demand. Especially in the beginning there should be transparency.

Afterwards there should be a kind of model that pays for the structure and people in place, but it should be an organisation that is transparent and independent of the solutions. Or make the companies pay an annual fee to pay for the HUB so that it stays independent. The municipality will still be owner, but the companies will be part of it.

5. **What kind of solutions (range of solutions) does the HUB offer? Are these solutions already available?**

KK: loans, subsidies are already available. Do you want a perfect solution or a good one? There are bank that provide loans for renovation and subsidies. These are good starting points. In Valencia they already have several instances to add to the shop to provide solutions. If we are a few years down the road, and we have solutions that are not perfect, but we have more money, then we can improve the solutions. There is no point to get the cities together to get the perfect solutions. You start with the simple, existing solutions. If the market says it is too cheap, we can make it more expansive and if it is too expansive, then we can make it more cheap (markt-werking).

Future possibilities

KK: transparency in all financing options and a menu. Creating a new solution, there first needs to be demonstrated that there is a market for. So then you can arrange everything for it. Multi-family buildings are the most challenging one, so that is something to focus on.

6. **What parties are missing at the moment to get the HUB up and running? Do you have suggestions who to contact?**

KK: there are no parties missing. We are so used to working within constraints, so rather than just thinking who else to work with, we just make do. We have all the right parties to work with. We should be engaging more with the professional side, to just hear their voice (contractors,

engineers, architects) to hear what they say. How did the amendment with Rotterdam go and how to develop this.

HVN: Rotterdam is still searching on what they want with the Save the Homes project. There are some collisions between different projects and we try to support them in getting some firm ground and strategic course in it, but they find that a bit more difficult.

KK: in task 3.1/3.2 they are doing a bench marking of all OSS across Europe. They have an excel of currently 55 programs right now, and it ranks OSS by low-touch to high-touch. It is not scientific. It is used to explain to partners to give people ideas of how some of these programs are cooperatives, how they work with subsidies and technical advice and the financing. This could also be done for Rotterdam in order to help them become more clear on how and in what way the OSS can work.

7. Are there any functionalities that is not spoken of at the moment, but you think are necessary to create a successful HUB?

HVN: the HUB is the complete customer journey by getting people aware that they should renovate homes and point them towards the right contractors in order to renovate. Feedback loops could also be interesting. The role of the HUB is more than only asking questions, it is also educating contractors. The HUB can also grow out into a knowledge centre.

KK: agrees with that. There is a customer centric, but the other part there is a need to generate the right contractors, so they get projects. B2C and B2B. Two different parts that are related to the HUB. It would be ideal to have an office with several people responsible for both sides (B2C and B2B) and related to Rotterdam.

HVN: the municipality is hopping on two legs: one is they are paid by the municipality so they cannot do much. On the other side, they are working with the energy community and they do not back the whole of Rotterdam, but in this case it is Prins Alexander. So, we are trying to discover why they are shifting the task to the energy community, as they are the city and should have a controlling role. It makes it more difficult, if and external company is responsible for the HUB. Suggestion is that the municipality brings it back to their department and make them responsible again.

KK: There does not have to be one way, the community can help the city and the city can help the community.

HVN: Rotterdam is starting it small, but if it is repeated in other areas, if you scale it up, it should cover the whole of Rotterdam.

KK: you bring them to the HUB (energy community) in order to scale what you do. Rotterdam does not have a lot of channels to work this way. The energy community can be perfect trust building partners and community experts and promotions ways to use.

8. When the StH-project ends, what is the first step to take, to continue the HUB?

KK: There should be one HUB, mainly provided by the municipality, and perhaps supported by the local energy communities, that can support them. In Rotterdam, we do not know yet what model will work as there are some things not yet clear. Valencia has a more clear business model, in order to look to the future.

Extra things that need to be said:

MJ: no, on Rotterdam side it is needed to get some clarification. Although the setup in Valencia is different, there can be some overlap. In Valencia we are already looking at the spreadsheet, so to say, and in Rotterdam that is not yet done.

Annex 2 – StH Document 2: Citizen engagement

BHG

Measures and additional parts

Renovating the roof ★★★	Replacing the glass ★★★	Measure 3 ★★★	Measure 4 ★★★
How much information do you need? ★★★	How much information do you need? ★	How much information do you need?	How much information do you need?
Do you need technical advice? ★★	Do you need technical advice? ★	Do you need technical advice?	Do you need technical advice?
Do you need financial advice? ★★★	Do you need financial advice? ★	Do you need financial advice?	Do you need financial advice?
How important is execution/aftercare? ★★★	How important is execution/aftercare? ★★★	How important is execution/aftercare?	How important is execution/aftercare?

What else do you expect?
Answer

Information if it is possible for my building

Other remarks for partners
Answer

VCE

Measures and additional parts

Measure 1 Improve façade insulation ★★★	Measure 2 Change fossil fuels boilers for heat pumps ★★★	Measure 3 Change windows ★★★	Measure 4 Install collective solar PV ★★★
How much information do you need? ★★	How much information do you need? ★★	How much information do you need? ★	How much information do you need? ★★★
Do you need technical advice? ★★	Do you need technical advice? ★★★	Do you need technical advice? ★★	Do you need technical advice? ★★★
Do you need financial advice? ★★★	Do you need financial advice? ★★	Do you need financial advice? ★	Do you need financial advice? ★★
How important is execution/aftercare? ★★	How important is execution/aftercare? ★★	How important is execution/aftercare? ★	How important is execution/aftercare? ★★

What else do you expect?
Answer

Other remarks for partners
Answer

Annex 3 – Workshop on renovation activities

Workshop on renovation activities

On June 3th 2021 the second technical workshop was organised. On the agenda were the demand and supply side the customer journey and the start of the citizen HUB. During WS2 we discussed the role of the HUB with the use of a MIRO-board. The preliminary results of the interview were used as starting ground for the grouped development session.

Motivation

The demo case In Rotterdam shows us that setting up a HUB is not just about putting energy measures together and advertising them to the citizens. The talk in the Rotterdam case focuses on the roles of each party and who is responsible for what. The municipality is in the lead but does not always want that role, or is fitted to fulfil that role. It is in line with the shift towards a 'participating society'. However, it is too soon to expect players in the market to assume that role on their own. There is some need for an extra push. This situation asks for a lot of finetuning before the outlines of a HUB can be defined.

In the Valencia demo case the Energy Office already functions kind of as a HUB. There it is less about roles, but more about how you can optimize what is already in place. In light of deliverable 4.5 (risks) we dedicated this workshop to the process of the HUB and the connections between tasks.

To speed up the process of demonstrating, we would like to start using *existing* channels in Rotterdam, so the decision making is not necessary (or on a project level instead of a strategic level) which costs less time. Also when looking to the upscaling as described in 5.3 we pick the best channels and use them. However, if we want to use existing channels, we need to know what these channels are, both in Valencia and Rotterdam. Therefore the roles, quality and risks are shown in chapter 6.

Approach

In this workshop we used a model that indicates all the necessary phases of a renovation and asked all consortium partners to fill in existing activities and new (wanted) activities.

The base of the figure consists of four quadrants, that make up an entire renovation. In the workshop each quadrant was handled separately, by adding post-its. Green for existing and pink for new channels. Afterwards, these post-it's were rearranged and labels were added that summarises the input of that particular part of the quadrant. It shows what is needed in each section.

The first conclusions, just based on the amount of existing channels and new channels can be found in figure 40.
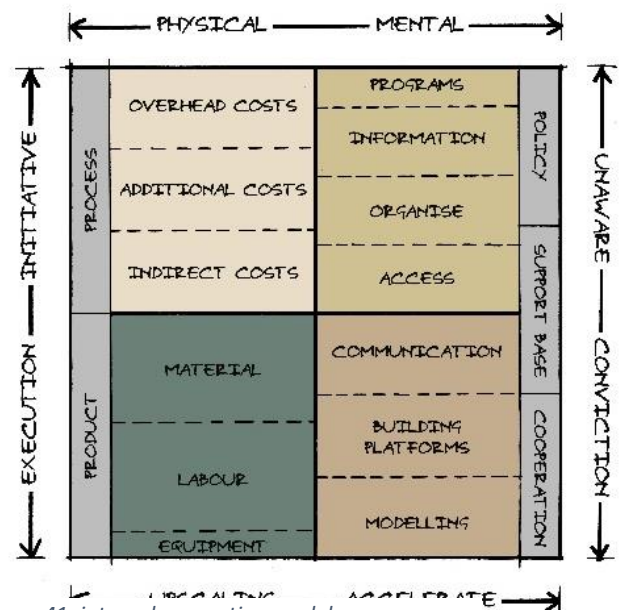

Figure 41: integral renovation model

All post-it's were analysed and summarised. This leads to the following figure (36), where the green post-its stand for existing channels and pink for new (wanted) channels.
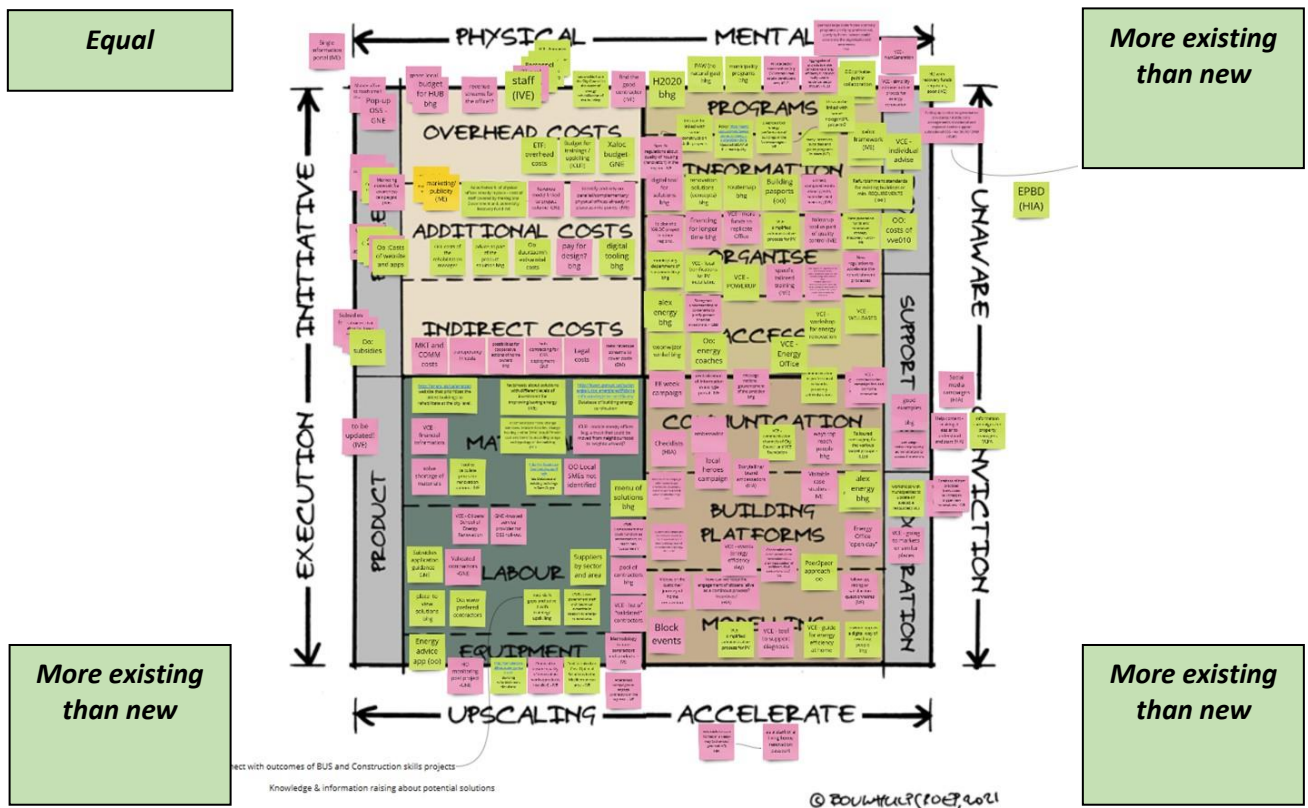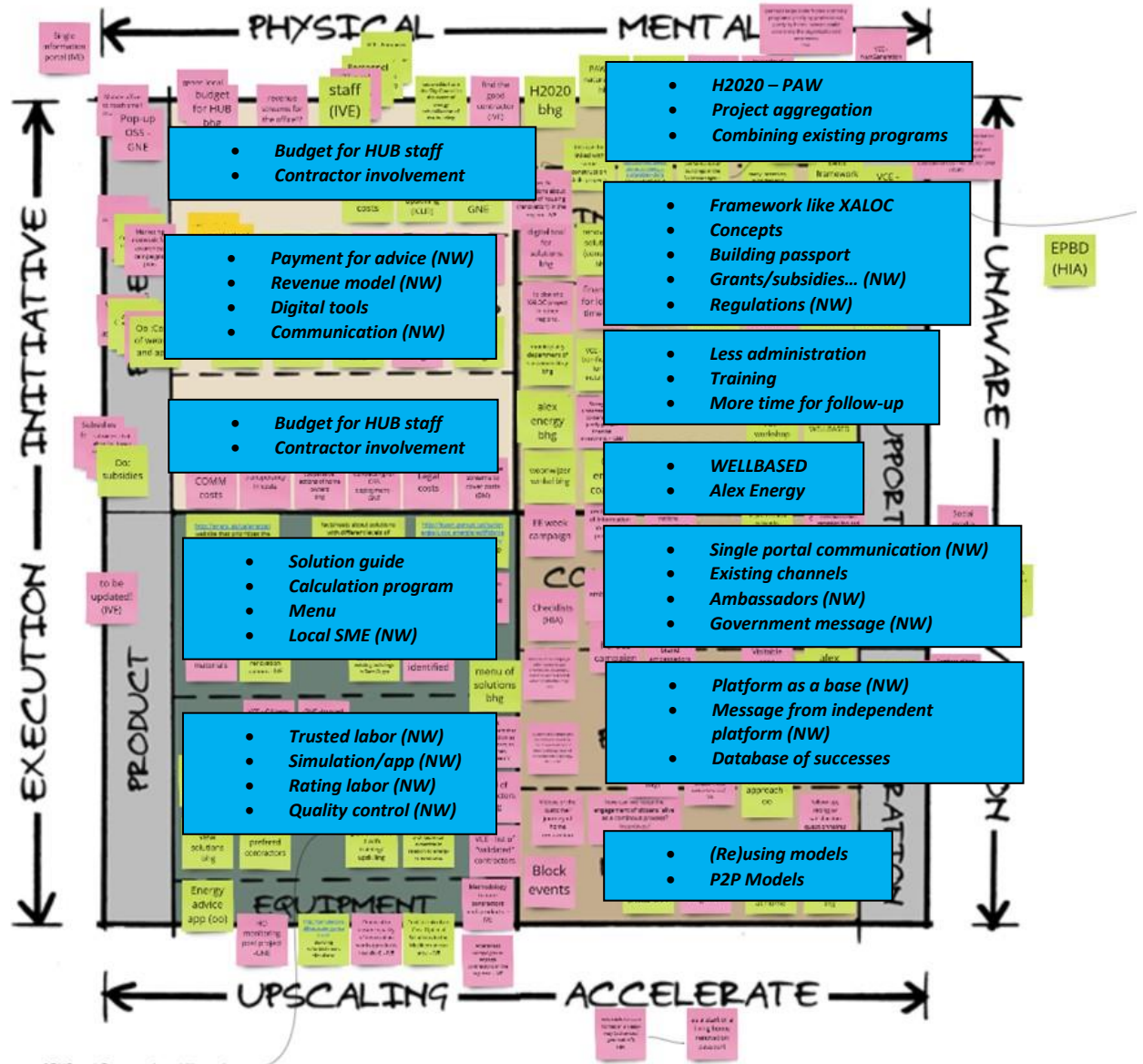

Figure 42: Analysis of new (green) and existing (pink) channels

So when we look at the outcome of this workshop, we can conclude that on the product level, there are more existing channels than new, which indicates that there are enough solutions and products. The process side shows as much existing channels as new channels. So there are options available, but there is need for improvement. On the level of policy and support there are more new channels than existing. This means that this is an area that needs improvement. The last quadrant, which is about platforms and communication shows that it is already available.

So the task that the HUB needs to fullfill is mainly at the process side and not the product side. This is in accordance to the definition given in chapter 6, that it is a place for information that supports the process. It is also good to see that on the platform level there are existing channels. So the HUB doesn't need to start from scratch, but can build upon existing initiatives.

Figure 44: Summary of the outcome of the workshop

One huge difference between newly built and renovation is that you need all the quadrants for a successful project. So, it is not only about filling in all the quadrants, but also how things are connected. For example, the way it is organised, or, for the HUB how it is made available to people. Therefore, also the consortium was asked to mention the connections they thought were key and available in their approach. This resulted in several connections per consortium member, but when added up, a focus can be seen.
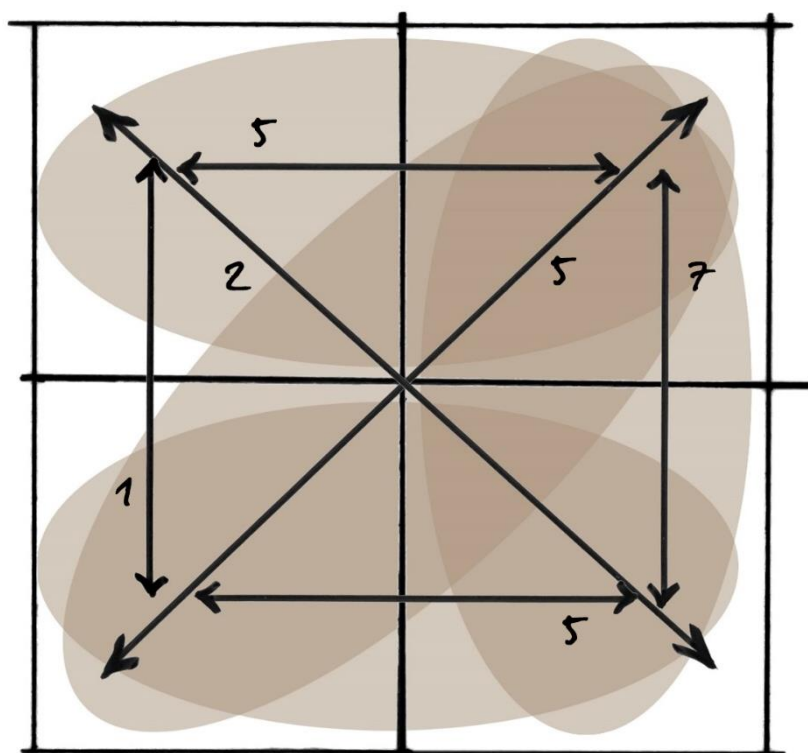
© BOUWHULPGROEP, 2021

Figure 45: Interconnection between quadrants

The figure above illustrates the four quadrants. The connections between the quadrants are shown by the arrows, each of them with a number that indicates how many relations there were mentioned by the consortium. The arrows that got the most relations (5 or 7) were coloured. The outcome is that quadrant 3 has the most connections. This is the quadrant that focuses on policy and getting a support base.

It is logical that this quadrant gets the most hits, as the Save the Homes project originated as a policy on how energy saving can be rolled out, so how to make policies more tangible. It is good to (re)establish this.

It also points out a difficult point of the project. It is not enough to make plans on paper and in policies, you have to make the step towards actual buildings and renovations. These steps are depicted by the arrows. These arrows are about reaching out to other parties and get them involved and on board.

With this outcome and the recommendations in figure 3, we can complete the risk assessment of D4.5 for Valencia and Rotterdam. It shows what can be added. For the follower cities (and the cities to come) it can function as a guide in setting up a local HUB.

Existing Channels	New channels
Budget for staff	Payment for advice
Contractor involvement	Revenue model
Digital tools	Communication with citizens
Solution guide	Local SME
Calculation model	Trusted labor
menu	Simulation app
Project aggregation	Rating labor (list)
Policy	Quality control
Framework like XALOC	Grants /subsidy
Concepts	Adapting regulations
Building passport	Single portal communications
Less administration	Ambassadors
Training	Government message
Time for follow up	Message from a platform
Alex energie	Independent platform
Existing channels	Database of success
Reusing models	
P2p models	

Figure 46 An overview of changes and currently available tools/instrument

Annex 4 – Step by step customer journey

A. This step is about the first contact people have. They are not concerned with energy, energy saving or renovation of their home yet. They are unaware of the need for energy reduction and therefore not interested. But you want to inform them of the possibilities via several ways, like social media campaigns, informal campaigns (folders or advertisement in public areas). Of course has the public opinion on energy saving changed the last two year, this also has an impact on the Save the Homes project. Another place where this awareness can be raised is at community meetings. This kind of communication can be digital or in a physical way where people can walk in or make an appointment

B. After the first contact a follow up is needed. This can be a website with (global) information or even a simple diagnostic tool to explore possibilities for your home. It is not detailed yet, but it shows you the direction you can go. The tool and website are digital ways to do so, but it is also possible to organise events where (groups of) people get information about the possibilities. Still, in this phase people are not aware that they should do something and have no clue whatsoever what to do, nor the budget needed for this.

C. After the follow up, a moment of contact is needed. This can be a contact form where you sign up for a more information or even a trajectory, but a call is also a possibility or a physical visit to explain all further steps. This visit can be a visit to the actual building, but more likely a visit to the HUB (or local office).

D. After the first phase step, 0: onboarding there is an entity that functions as a starting point. This is called the HUB. It is a place where people can start their customer journey, when they are already onboarded (they know that they want to do something). People that already know that they want to participate can go directly to the HUB, skipping the onboarding phase (0). We now go into the design phase. Although design is perhaps a word that is to definite. A (building) design distinguishes three phases a sketch design, a preliminary design and a definite design. Definite design is Step 2The next few steps are about the sketch and preliminary design. Now more detailed information about the home is needed. Perhaps a viewing of the premises is needed. In the Rotterdam pilot this was already done in (B) but that is too early in an optimal process. In the Valencia case the information is obtained from/with the occupant, during the visit to the energy office.

E. One of the key elements in decision making is finance. This needs to be done on the investment side of the task, as well as on the profit side. So what will the renovation cost, and how much will I save by these measures, and can there be a balance? For a just calculation to obtain the money there is also a cost to take into account (i.e. the costs of a loan). For the citizen the overall decision making will focus on the amount of money needed. Although the mapping in WP2 showed that people are less inclined to commit to a loan, with a solid and trustworthy proposal at least part of the market could be reached.

F. Now an action plan will be made. Until this moment it was about onboarding people and a first (global) design, so you know the possibilities for your dwelling. From this point on, it is getting serious, you actually want to renovate your home. But before this can be done we have to know exactly what is needed. In this phase you still want to choose some details, but in general the sort of measures are known. Because now it comes down to your own home, it is reasonable to ask a fee for the oncoming work. The prior phases were free of charge (until now).

G. Now the trajectory starts where the actual plans are made. Now is the task to select all the ideas and choices from the first part of the journey (leaflets) into a plan. In the Rotterdam case this will be done as a collective, so you have people around you that are going through the same choices. But not all plans have to look the same. Because now the information goes into advise a fee is applicable for the following steps. If people want to proceed they pay a sum as a collective. This fee allows professionals to develop a plan together with the citizens. In Valencia this phase is more an individual search, where a professional needs to help you. This can be a contractor (then you are combining step 2 and step 3), or an architect / consultant who makes a design together with you. The energy office can point you in the right way to one of these professionals therefore there is a list available. This is a regional initiative valid for any municipality in the Valencia Region, therefore, for Valencia too (https://registrochc.five.es/empresas-y-profesionales/)

H. Step 0 and step 1 are all about getting the right information and references. Citizens get an impression of the possibilities of their home and the costs that come with the plan. Now the renovation advice actually goes into

your own dwelling. So now it is no longer about a building that looks like your building, but we use information about your dwelling and your energy consumption.

I.   The plan you make has to be paid for. In this phase the investment needed for the renovation are known. Based on this amount, the owner needs to see how he is going to pay. There are possibilities to get guidance on this topic. Some global information can be given in the Hub. However, if it gets into the personal situation a financial professional should give the advice. i.e. a board or perhaps an independent consultant. In Rotterdam the Energy Transition Fund is in place. In Valencia the owners or the professionals contact with financial entities and can consult any doubt to the Hub. Some contractors already have a financial entity supporting the costs, and some financial entities have their products advertised in the Energy Office (also through the save the Homes financial information brochure). Finally, the list of potential grants supporting energy retrofitting is extense, and a compatibility tool is being developed for improving financial advice from the energy Office.

J.   Now the final plan is made. The collective has made a plan for all the homes. This does not necessary have to be one plan copied over 25 homes, but he plan can consist of several measures divided over the participants. This is also the last opt out for people. If the plan that is developed is not according to their desire, they can decide to stop and leave the whole trajectory, before a quotation is put out. However the design fee is paid.
In Valencia this route is an individual route. From taking the initiative until the plan and even the quotation, the household makes its own plan. This can also be part of a condominium, in that case, the Hub offers support to the neighbours and/or the condominium manager in their decision-making and convincing all households. In this 'individual' process professional support can be of use, but it is up to the household to employ this professional. This can for example be an architect, a contractor or a building expert. The HUB does not play a role in this part, rather than providing a list of possible contractors.

K.   In this phase the final plan is set to market with quotations. Ideally this is done within a proven network of contractors. These contractors can be evaluated in the in-use phase, and they can learn from previous projects. For the citizen comparison of price (fair value) is of importance, so multiple quotations will be asked. Perhaps, in the future fixed prices could be used both saving time for contractors and gaining trust by a guaranteed quality and price by the HUB. For now the (Dutch) market is so stressed that no results occur.

L.   The renovation contract is the direct agreement between the citizens and the contractor. From this point on, the HUB only has a role as follower.

M.   Start of the execution of the work

N.   For citizens it is good to know what they are up to. Renovating is not their usual work, so they do not know how long it takes or what the activity entitles. Therefore, information is needed. Renovation is all about management of expectations. So it is better to say the work is finished in 8 working days, then we will be ready in probably 6 days. Because in both cases when it takes 7 days, people will be upset that it took longer, but in the other day, people are relieved that the work is done sooner. A personal dashboard will help to manage expectations.

O.   During the last phase an inquiry can be used to get the opinion of citizens. As a feedback to the process, as a way of quality control and for improvement of the HUB method.

P.   This report focusses on the functionality of the HUB and not rather the individual results. It can be used to monitor the city approach, but does not help individuals. So it is part of the business case and KPI's as discussed in D4.3

Q.   The in Use Phase (step 4) focusses on getting the information of the previous steps back to the front, so we know better to target people, show solutions they actually want a look at how contractors and other participants have acted.

R.   Each city is working to a specific standard. Whether it is a national standard or just a solution that is good and fits with a lot of houses. These standards offer a starting point for new citizens

S.   Retrieving all necessary information

T.   Questionnaires on the whole process. In step O also the possibilities for a questionnaire are mentioned. The difference is that now the whole process is finished. Doing both could be a risk, of people not filling in the questionnaire.
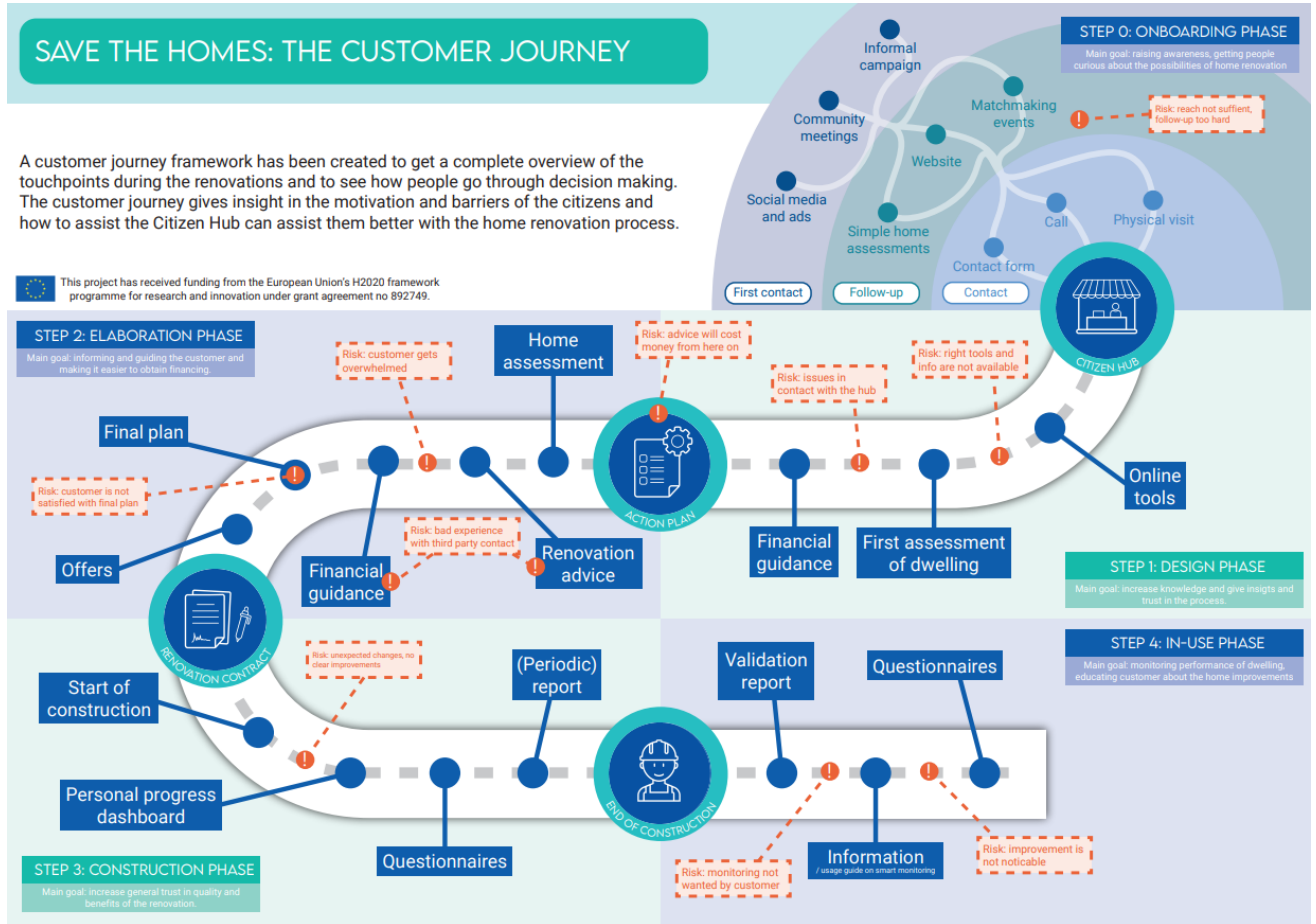
Save the Homes

Annex 5 – List of acronyms

In the Save the Homes (StH) project, a lot of acronyms are used. An overview of the most used acronyms, and abbreviations is mentioned below

HI&A	Huygen Engineers & Consultants
GNE	Global New Energy Finance S.L.
BHG	Bouwhulp Groep
RDM	Rotterdam Municipality
IVE	Valencia Institute of Building
VCE	Fundación Valencia Clima i Energia
VRCP	Valencian Regional Council of Property Administrators Associations
SCUG	Sant Cugat Municipality
COL	City of Ljubljana
UIPI	International Union of Property Owners (Union Internationale de la Propriété Immobilière)
ICLEI	ICLEI: Local Governments for Sustainability (International Council for Local Environmental Initiatives)
StH	Save the Homes
HUB	A HUB is trustworthy place, where citizens can get information, in a digital or physical way, to get acquainted with (sustainable) renovation, the measures, the finance and the impact it has on living. Besides information, it functions as a gateway towards contractors, suppliers and intermediates, so that individual homeowners can actual make the step towards execution.
EIB	Economisch Instituut voor de Bouw, Dutch for Economic Institute for construction sector.
IHRS	Integrated Home Renovation Services

Annex 6 – Pilot Rotterdam