Save the Homes

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1 Executive Summary

The overall aim of **Sav€ the Homes** is to facilitate the upscaling of energy efficient renovating houses. Therefore a process of onboarding designing, elaborate, construction and of course in-use is described as a On-Stop-Shop approach. This deliverable on 'documented quality and achieved targets of the renovation activities' describes the way the **quality** of the homes can be quantified. It shows that quality control is important, mainly to ensure that the demanded quality is **actually reached**, but also because of the possible negative outcome if the results of a OSS are regarded negative. More than with a single project, repetitive solutions are dependent on how the **market sees them**.

In this deliverable the quality control of the pilot project in Rotterdam is described. It is an extensive way to control a project, but it contributes to the overall results. In Valencia there is a problem that the outcome of the project cannot directly be followed. In the last paragraph of this deliverable some **recommendations** on monitoring are given. From example that quality control could be an additional (paid) service by the OSS, or that a label can be used to get a grip on the outcome of the renovation, but also as a means to guide subsidies or other ways of funding.

2 Projects

The aim of the pilot projects is to facilitate the upscaling of energy efficient renovating houses. Therefore, in two cities (Rotterdam and Valencia) pilots were conducted. Two follower cities are using (part of) the knowledge developed in the pilots in their own situation.

The focus of Save The Homes lies with the privately owned houses. This means that most of the clients are no professionals. They have no idea what to ask for and how to describe their wishes. At the same time the construction sector has to deal with a bias when it comes to quality. Renovation solutions would not meet the wishes, are too costly or do not fit together. There is a gap between supply and demand. The mapping in Workpackage 2 on as well the demand side as the supply side shows that gap.

If sustainable renovation must become an every day business, the action of deciding to do a renovation must be as simple as buying a pair of new jeans; you know what you get, with the known waste and height it will fit, and if something happens after all, you can go back to the store. How different is the building sector, where the quality when finished can differ, and where different parties point to each other when something goes wrong.

Figure 1 Quality control of performance is needed

This means that quality of the (sustainable) renovation is an aspect that we cannot ignore. Quality must be high. On the one hand a high quality is needed to reach the high ambitions, connected with a deep renovation. An installation that is not properly installed will not reach its prospected gain, getting dissatisfied clients and results in not reaching the climate goals. To circumvent these kind of situations, the quality of a product must be good. But also quality of work must be good, so the overall performance is reached. If there are no complaints and people see that everything is right the first time, people will tend to undertake the same steps.

'Quality of renovation matters must be good.'

This largely has to do with image and perspective. Within Save the homes an important task lies with the HUB, whatever form that may be (physical or digital). In Valencia the HUB is the network of energy Offices. In Rotterdam it is the role Alex Energie performs. It is important that it is trustworthy, that people have a good feeling with the results. In earlier deliverables we defined a HUB as:

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.

2.1 Rotterdam

Figure 2 the neighbourhood divided in components

One of the solutions is making more use of the available replication in the city. In the Netherlands we have the advantage that a lot of buildings are similar. During the consortium meeting in Rotterdam (CM4) this was shown with the presentation and excursion in the area. This also can bee seen in figure 2. But this replication allows for a more concept based approach. If you know how the buildings look, you know what to offer. This can be put in a menu, that people can choose from. If we can work in such a way seeking out the right renovation solutions becomes more like buying a new pair of jeans. A renovation is like a product that you take of the shelves.

But if a renovation is an of the shelf product, than the quality is known upfront, and quality control can be organised as well. This is one of the advantages of mass customisation. The same solutions will be applied throughout the neighbourhood. In the last phase of the route to realisation (figure 3) the moment of quality control is set.

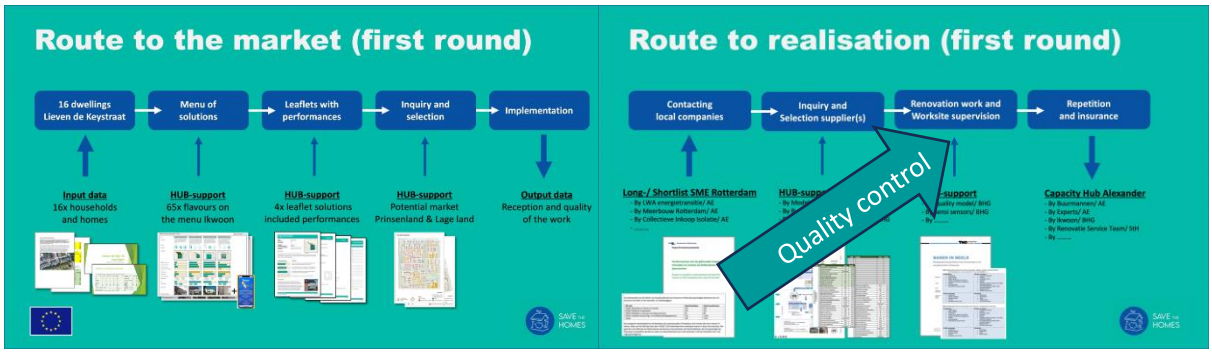


Figure 3 Steps in the Rotterdam case to come from onboarding towards realisation (also see D2.5)

2.2 Valencia

In Valencia the route of the customer journey is different from Rotterdam. In Valencia people can come to the Energy Office and get advice. Advice on their bill, advice on how to renovate their home or advice on how to engage their other condominium owners. They also get advice on the actual measures they can take. But from that point on the link with the Energy Office diminishes. People can get information on available contractors, but the office cannot recommend a specific contractor. As a lot of municipalities have to stay independent. This means that people that want to do a renovation have to look for themselves. From this point on, the Energy Office 'looses' the owners, they do not know if the citizens are doing any renovations, and they certainly do not know what they have done. So, there is no influence on the outcome of the renovation or quality control. They can point out what qualities are needed, but they have no way of finding out whether they are followed. In light of monitoring, in Valencia they can match advice that has been given with subsidies that are issued. That gives a way of conversion. This is a gross number, and not information address based. But on the level of control there is no control.

Improvements to this level could be made by not just an indication of what the measures are, but also providing citizens with a checklist that they can use afterwards to check the measures (done by the contractor) themselves. Although the measures are less uniform in Spain than in the Netherlands, there are measures that are often reoccurring.

Another option is to offer quality control by the Energy Office, just to ensure quality. This could also be good as a feedback loop for the office but has a rather high demand on labor. This would mean that one or two technical people should visit all renovated homes. This could be a paid service, but then people need to see the extra value, for example they could issue a label or approval as well. And perhaps this label than can give you access to finance, (tax)reduction like in San Cugat or subsidy.

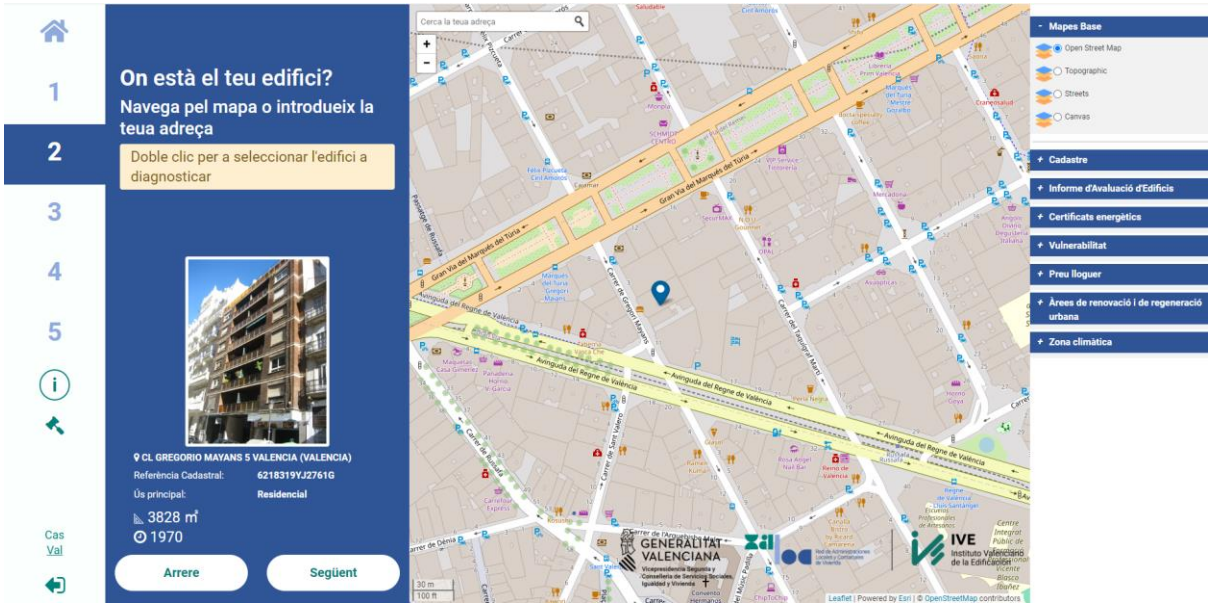


Figure 4With RenovEU a lot of data can be gathered, but the execution part is not in I (yet)t. With a quality check the quality 'as is' can be put in as well allowing to track progress of the renovation pace.

3 Quality

3.1 Rotterdam

In the Netherlands quality of building used to be delegated to the municipality. With the recent changing of laws, quality control has become a private question. Except for some major constructions, contractors can do their own quality control. So, in the renovation process, it is also up to the contractor to ensure the quality. This is quite a grey area. The one who is doing the work is also responsible for control of that same work. In the laws it is written that a contractor has to provide proof (i.e. photos) to ensure that it was built according to plan in case something happens. Buit it is also up to the client to put in the brief and agreement how quality control must be arranged.

In a One Stop Shop, a lot has to do with trust and reputation. Quality and quality control must be part of the total offer. Therefore, in the pilot project quality control was part of the work. From step 2 the citizens of pilot 1 wanted expert guidance to bring their project to an end. A lot of work for the HUB was done within the project, this was work outside the project. From the point on that the citizens in the first project were serious about the action and a real plan was formed, they paid for expert guiding. This was money spent on the process of making a plan, getting a permit, asking for quotations and selecting partners. So, all this work directly contributed to their homes, and that is why they were willing to pay for it. Also, quality control (after the work) was part of this guidance. As explained before, the quotation part failed, and the building collective emerged. This was organized by the citizens themselves.

Figure 5 law on quality control (NL)

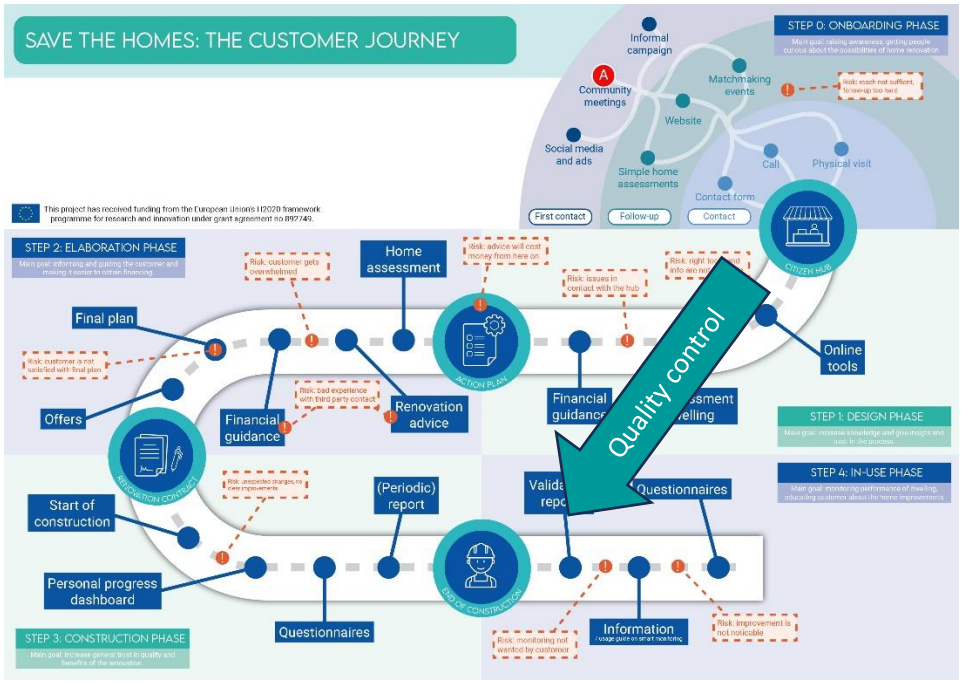


Figure 6 Customer journey and quality control

9 (out of 16) homes were finished in Q3 in 2023. As a first way of quality control, we received a video of one of the homes. Although a good first way to check basic quality, it does not meet the needs for quality control.

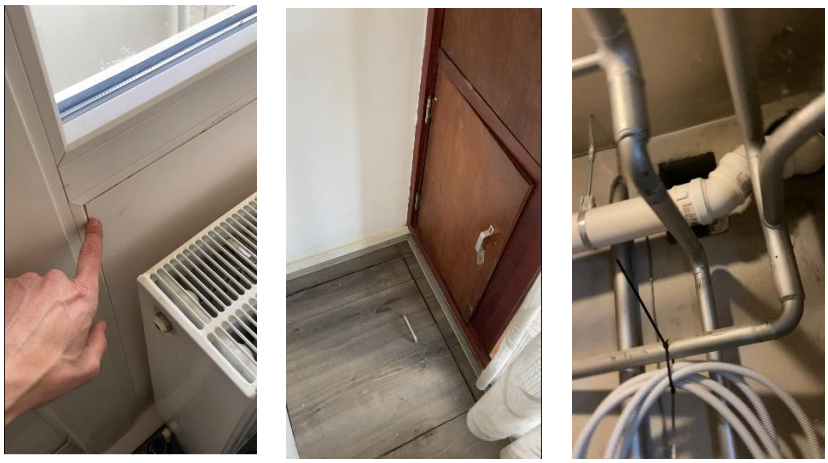


Figure 7 Still from the first (self) inspection video

However, for the right quality control we waited some time. Just to see if errors occurred in the first few months and because we needed a cold month to see what the performance of the installation was. A professional technician visited the nine homes, looking at the work that was performed. For each of these houses a report was made. For each house such a report was made:

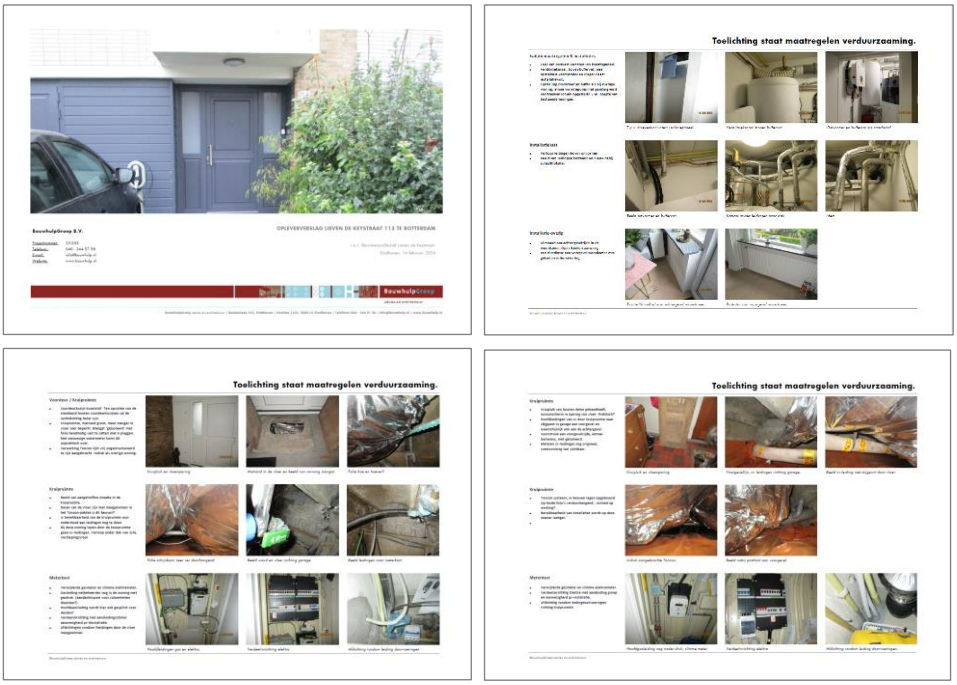


Figure 8 Example of a quality report per house

These reports go into the following aspects, when applicable in the building:

- Crawl space / floor
- Electrical installation
  - House
  - PV installation
- Insulation
  - Façade
  - Roof
  - Front door

- Installation (general)
  - Heating
  - Ventilation (central / decentral)

Overall, we could see that the work has been done properly. Some minor defects were seen. With some recommendations the report is finished and handed over to the owner. They can report it to the building collective to solve the problems.

A point of improvement was the documentation that was handed over to the owners. Like the manual of the installation (Pv, heat pump, ventilation) but also on the products that were used, like the insulation or electrical installation.

3.2 Valencia

From this point that people get some advice towards the actual execution, the Energy Office no longer tracks the owners. Therefore, they do not know if the citizens are doing any renovations, and they certainly do not know what they have done. This partly emerges because of the top-down approach used in Valencia. Because they are an organization paid for by the municipality, they cannot advise one contractor. So, it becomes up to the people to look for a contractor themselves.

Although the offices in Valencia do offer services all along the renovation journey, including during contractors' hiring, renovation doing and results measuring, as a public service, it does not want to interfere with private market or compete with the services that are already covered by the market, so in most of the cases, the track of the user is lost in the final steps of the renovation journey.

However, the Energy Office sometimes does call back actions, to ask if people that did come to the office took any measures. But this is a time-consuming way to get information. And often you call people that have not done anything yet, but perhaps will do so in the future, so are you going to call another time. Besides that, because it is a time-consuming approach, it is not a structural way.

As an example, by the end of 2023, the offices conducted a survey with users that have received assessment about energy renovation. In total, 20 users replied to the survey, showing the following results:

Did you do any change in your household after receiving assessment from the office?

30%: no, none

20%: I changed my windows

30%: I improved my insulation

40%: I asked for private contractors' budgets

If you didn't do anything, why not?

12.5%: lack of time

37.5%: lack of money

25%: it doesn't depend on me

12.5%: I consider there is no need to do anything

25%: other reasons

Did you propose any renovation to your condominium neighbors?

60%: no, nothing

10%: I proposed to do external insulation of the building

15%: I proposed an integral renovation of the building

25%: I proposed a PV installation and/or aerothermal heat pumps

INITIATIVES

Next to the actions of the energy office that are linked tot the actual every day situation, there ae some initiatives for all steps in the customer journey to get a grip on quality:

Stop 0 - Onboarding

Spanish pilot is focused on triggering energy renovations, therefore, quality assessment is focused on the first steps of the customer journey, but leaving aside the Stop 0 – onboarding, where awareness materials have been designed in order to drive citizens into energy renovation, and focus on quality assessment relays on the decision-making stages.

Stop 1 - Design

At the end of the Project, and given the data available from all the Citizens Hubs, which is the data coming from the subsidies' applications, design quality is assessed considering the way in which the renovation has been designed in terms of energy efficiency objectives and coherence (i.e., renovations achieving non-renewable primary energy (nrPE) savings without considering energy demand reduction are the lowest in the ranking):

· (1) reduce demand & reduce nrPE >60%

· (2) reduce demand & reduce nrPE <60%

· (3) reduce demand & don't reduce nrPE

· (4) don't reduce demand but reduce nrPE

· (5) don't reduce demand and either nrPE

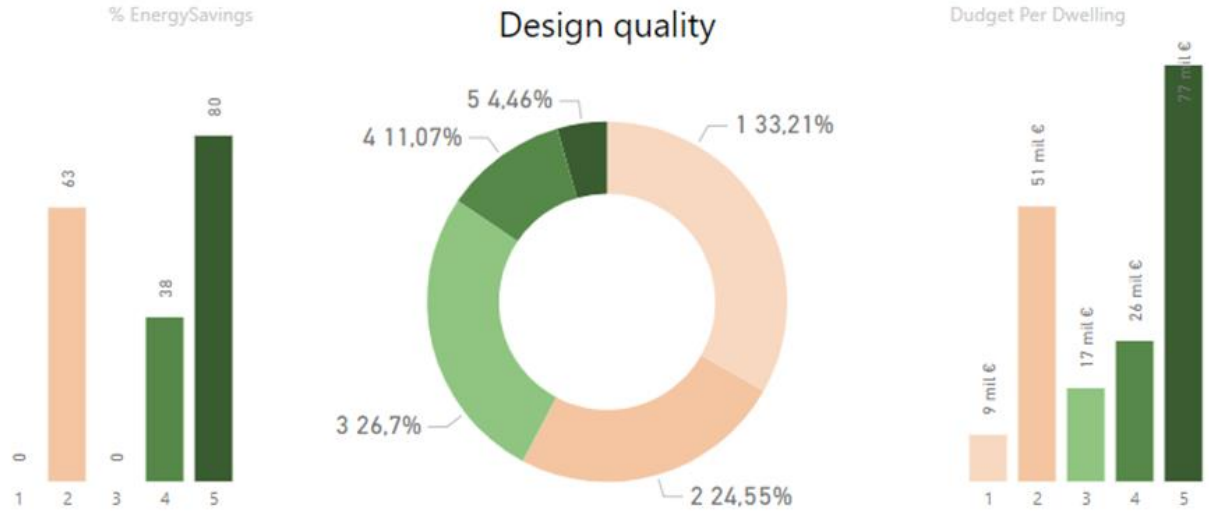


Figure 1.- nrPE savings, distribution and cost per dwelling of the 5 design quality levels defined

This information is to be used to learn where to put the effort on supporting designers to introduce best solutions to homeowners, emphasizing on the insulation if big number of projects have forgotten about it, or renewables, if even the project is about insulating, the don't get to reduce nrPE.

In our scenario, we see some interesting points:

· First, insulating is not a priority (level 1 & 2)), maybe because of the inconvenience and disruption of this type of works, maybe due to the bureaucracy involved.

· On the other hand, there is a number of projects which started with insulation but didn't get to save energy (level 3), here follow-up is convenient, to study which systems changes will make their effort worth.

· Also, interesting how 'incorrect' interventions, implementing active measures with no passive measures at all (level 2) get an important energy reduction, but also at high upfront cost, which will make difficult/ long the return of their investment.

· Finally, proper deep renovations (level 5) are scarce, due to the high costs, but energy cost are almost completely eliminated, so these interventions are to be followed up in order to improve implementation efficiency, reducing the upfront costs and calculating return scenarios, in order to try to promote these types of interventions.

Stop 2 - Formalization

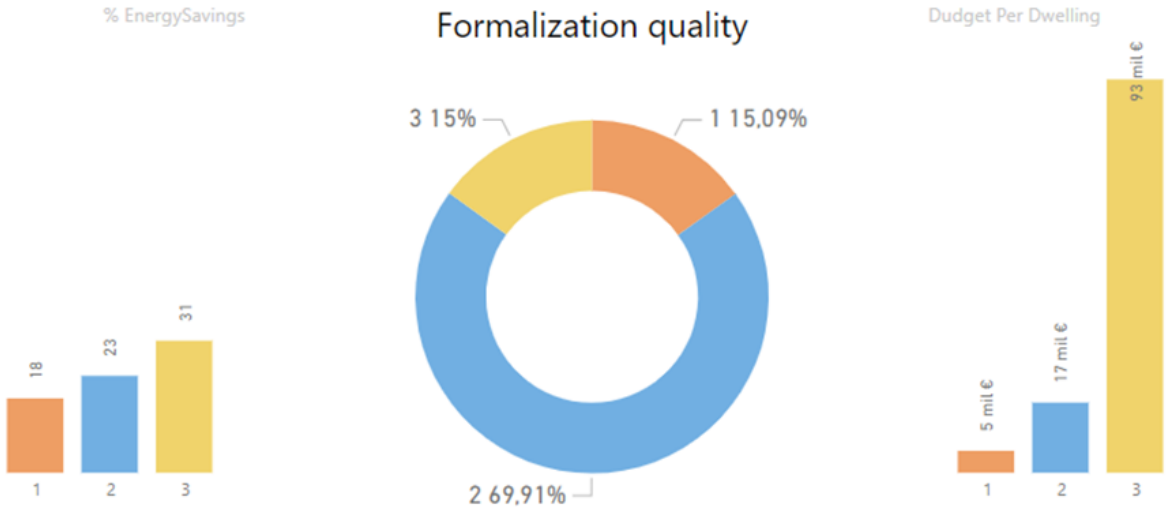
At the end of the Project, and given the data available from all the Citizens Hubs, which is the data coming from the subsidies' applications, formalization quality is assessed considering the quotations offered by craftsmen and contractors to realize the designed renovation. Therefore, for each design quality level, the budget per dwelling distribution is analyzed, considering that formalization quality lies in an average cost for achieving the same energy objective. Too cheap a budget is a warning for potential poor execution, bad quality materials or procedures. Too expensive a budget is a sign of a potentially unreliable contractor, unexperienced or trying to take advantage of the existence of subsidies or energy renovation wave.

· Budget below the 15th percentile

· Budget above the 85th percentile & below the 85th percentile

· Budget above the 85th percentile

This information is to be used for learning about market dynamics, and where to put the effort to improve trust and transparency, easing the decision-making process for homeowners.



In our scenario, we have flagged extreme renovation budgets as the ones which statistically lie in the 15% lowest budgets for each design level, and in the 15% highest. Reasons for these extreme values can be multiple, such as biggest interventions, innovative or rare solutions or materials, incorporation of interventions which do not affect energy performance, etc… but we will pay attention to them in order to try to find out flaws in the energy renovations formalization:

· First obvious thing is that expensive renovations get higher energy savings, but at a really exaggerated cost, therefore, those contracts should be analyzed in order to control if contractor is behaving properly or just renovation goes far beyond energy renovation needs.

· On the other end, cheap renovations achieve lower energy savings, but at very lower cost, therefore attention is to be paid to realization, in order to determine if there is a performance gap from design to reality, or, if on the other way round, those renovations are extremely effective in economic terms.

Stop 3 – Realization

As observed in previous stops assessment, there is a potential for ensuring quality in this stop. Nevertheless, efforts needed exceed the resources available in the citizen Hubs in their actual shape, and quality is only assessed by personal appointments with interested homeowners looking for solving doubts, or by sharing concerns and experiences in the collective workshops and meeting organized for gathering different stakeholders (homeowners, professionals and contractors) together.

Stop 4 - Evaluation

A pilot experience was carried out for monitoring energy and IEQ performance before and after energy renovation. Due to time constraints, those data are not suitable for assessing quality of the carried-out renovations, since they are related to buildings without renovation, and to buildings already renovated, but from whose projects we don't have access in the same terms as the ones analyzed here.

Nevertheless, monitoring arose very interesting data for developing a future mechanism of quality assessment before-after renovation and produced very welcomed by homeowners' reports.

All the information about these monitoring campaigns can be found on D4.7.

4 Conclusion

In the Rotterdam case quality control was something the owners specifically wanted, just to ensure that if they pay such an amount of money, the results are what may be expected. That is why they were willing to pay for this service. One of the generic lessons we got from Save the Homes was that people are not willing to pay for generic advice, but when it comes to your own house and your own project, they are willing to pay for certainty and professional aid.

In Valencia there is no quality control from the Energy Office. But based on the big data that is available, for example the amount of grants and known reductions, some lessons can be learned. These lessons can be incorporated in new policies and in future monitoring.

In future, it is up to the HUB / OSS at least to offer quality control as a part of the service. As a needed assurance for people to step in to the HUB, but also to establish a good reputation and to maintain it. If a checklist is available, then the kind of quality or the quality that will be checked can be communicated with the owners. In the case of ready to use renovation offers, this is easier to do. In the future, one can even think about giving a label or mark of approval when the building passes the standards that are set by the one stop shop. This will also make sure that good contractors will be involved in the work that the OSS provides. However, as long as we are in a market where we have to deal with whoever wants to work, external quality control based on experience will have to do the job.


Quality control
As part of work for the collective,
paid for by the citizens
H2020
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