



SKILLS
INSTRUCT
INSTRUMENTS
CONSTRUCTION

Expectations of building and homeowners



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 894756.

D3.5 Report on expectations of building and homeowners

Dissemination Level: Public
Lead Partner: LIST
Due date: 30/11/2021
Actual submission date:20/02/2023

Published in the framework of:

Evidence-based market and policy instruments implementation across EU to increase the demand for energy skills across construction sector value chain.

Authors:

Sébastien THOMAS, LIST
Sylvain KUBICKI, LIST
Marcello CURCI, DTTN

Revision and history chart

| Version | Date | Editors | Comment |
|---------|----------------------------|----------------------------|-------------------|
| V1.0 | 3 rd Nov. 2022 | SébThomas, LIST | - |
| V1.1 | 16 th Nov. 2022 | SébThomas, LIST | UIPI survey |
| V1.2 | 22 nd Nov. 2022 | Marcello Curci, DTTN | Internal Review |
| V2 | 2 nd Feb. 2023 | Sylvain Kubicki, LIST | Review |
| V3 | 14 th Feb. 2023 | Agnieszka Kowalska, ASM | Review |
| Final | 16 th Feb. 2023 | Sylvain Kubicki, LIST | Final corrections |

Disclaimer:

The information in this document is subject to change without notice. Company or product names mentioned in this document may be trademarks or registered trademarks of their respective companies.

All rights reserved

The document is proprietary of the INSTRUCT consortium members. No copying or distributing, in any form or by any means, is allowed without the prior written agreement of the owner of the property rights.

This document reflects only the authors' view. The European Community is not liable for any use that may be made of the information contained herein. Responsibility for the information and views expressed in the therein lies entirely with the author(s).



Table of contents

| | |
|--|----|
| 1. Executive summary | 3 |
| 2. Context, building owner classification and expectations | 4 |
| 2.1 Context | 4 |
| 2.2 Building owner classification and interests | 5 |
| 3. Studies and surveys on building owner’s expectations | 7 |
| 3.1 PLURAL project survey results | 7 |
| 3.2 UIPI homeowner survey | 7 |
| 3.3 Homeowner survey INSTRUCT project | 9 |
| 3.3.1 Methodology | 9 |
| 3.3.2 Results | 11 |
| 3.3.3 Lessons learned | 13 |
| 3.4 Lessons learned from INSTRUCT Demo 5 (WP4.5) | 14 |
| 4. References | 15 |
| 5. Appendices | 16 |

List of figures:

| | |
|---|----|
| Figure 1: The Roles of Stakeholders regarding EPC and Energy Efficiency Measures (Laura Muhr, 2020) | 4 |
| Figure 2: Type of end users and their interests and scope of actions (Laura Muhr, 2020) | 6 |
| Figure 3: UIPI survey: type of renovations planned in percentage of respondents (Causse, Figueira, Gutiérrez, & Panagiotopoulou, 2021) | 8 |
| Figure 4: UIPI survey: incentives to motivate renovations in percentages of respondents (Causse, Figueira, Gutiérrez, & Panagiotopoulou, 2021). | 9 |
| Figure 5: INSTRUCT survey: works carried out | 11 |
| Figure 6: INSTRUCT survey - skills of workers (1: not very skilled - 5: very skilled) | 12 |
| Figure 7 : INSTRUCT survey - importance of certified/labelised companies (1: I did not pay attention to - 5: I paid attention) | 12 |

List of tables:

| | |
|--|---|
| Table 1: Homeowner category for the analysed surveys | 6 |
|--|---|



1. Executive summary

This deliverable captures and analysis results of survey amongst building and homeowners in Europe and delivers some recommendations for a quick market uptake of energy related skilled workers. It details first the homeowner classification and interests related to energy performance.

Home and building owners have a great impact on actual energy efficiency: they decide to renovate, to buy, sell buildings. They have the large scope of action; this is in principle particularly important to elaborate on the building user/owner expectations on skilled workers.

Among the different surveys (mainly focus on residential buildings owners), a lack of qualified people is not the main barrier for energy/environmental performance perceived by the building owner. Cost is the most important factor influencing the decision of renovation of buildings. Nowadays, cost of energy is pushing forward. Moreover, the lack of qualified worker has also a negative impact on services availability, quality and price. A second barrier illustrated is organisation of the works: the owner wants an efficient renovation process (data based, coordinated, quick, cost effective) to achieve the energy (and cost) reduction expectations.

The building owner have biases on their interpretation of information, so they are not always aware of what to do (this is especially the case for the owner of a single dwelling). Work could be done to bring a better information and pick up their lack of knowledge to have greater impact.

On a methodological point of view, it is hard to involve building user in surveys, other projects have also had issue to grab many answers in the field of building owner expectations. This is probably linked with the aforementioned statement.

At the time of writing these lines, Europe faces challenge of decreasing quickly and drastically the use of fossil fuel. So, a huge building renovation plan is about to get underway in all countries/region. In addition to the use of decarbonized new materials (insulation material requiring low energy to produce), the needs of energy efficiency qualified people are growing very strongly. It seems that once the financial barrier is overcome, the importance of the workforce is crucial.



2. Context, building owner classification and expectations

2.1 Context

Building owner is one of the stakeholders of the energy efficiency value chain presented in D3.4 Report on sensitization methodology towards producers and retailers, but is quite far from the training and skill development programs developed in WP2. Despite building owners are not always involved in these schemes, they have a great impact on actual energy efficiency: they **decide to renovate, to buy, sell buildings**. They are really decision making in building energy performance features. To deliver an efficient message for market uptake of energy related skilled workers, it is essential to better know who the building owners are and discover what they need. To better know them, we have classified the different sort of building owners, conducted survey about their expectations and analysed the results. In this report, the term “owner” relates to the ownership of an existing property (not considered from the future building investor's perspective).

In the H2020 EPANACEA project¹, the roles of stakeholders related to Energy Performance Certificate are identified. This is a good entry point for discovering the various roles and actions a building owner must take. This project deliverable is illustrated in Figure 1 where the stakeholders are pointed out as well as the actions and the possible attribution linked with the interactions (in blue). Building owners clearly play a central role for decision making on the more effective energy saving measures. Behind the term “end user” some roles like tenant, landlord, building occupant, building manager are sometimes hidden. A classification is suggested in the next paragraph. The end user has the most numerous interactions with other stakeholders, and he is probably the less trained for making those interactions efficient. End user has potentially a high level for improving the energy performance of the buildings.

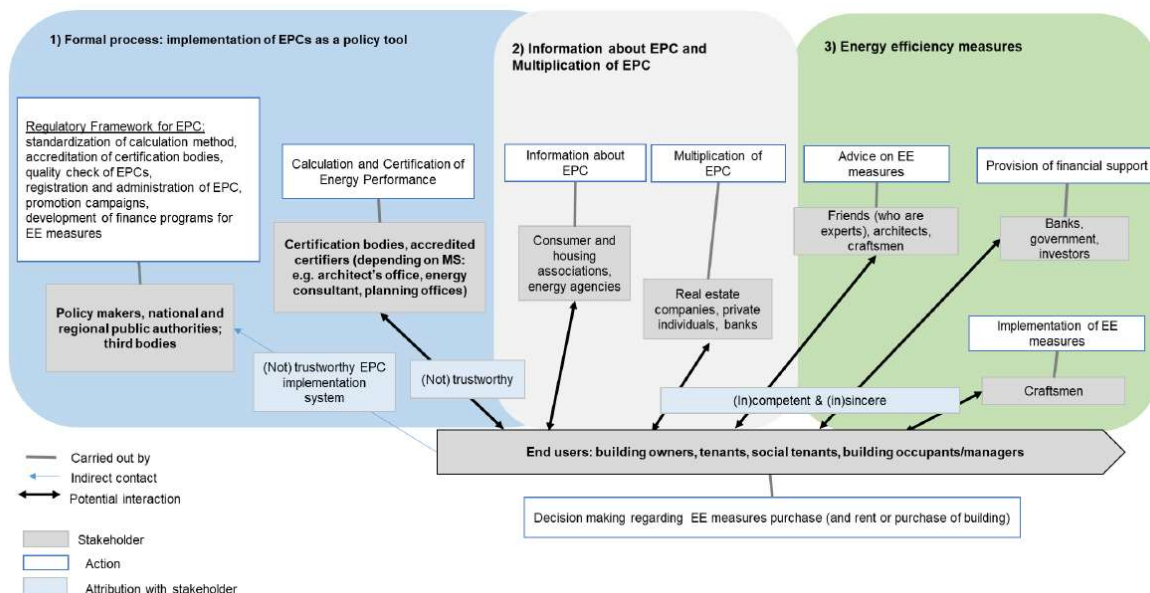


Figure 1: The Roles of Stakeholders regarding EPC and Energy Efficiency Measures (Laura Muhr, 2020)

¹ <https://epanacea.eu/> Accessed on November 2nd, 2022

2.2 Building owner classification and interests

The EPANACEA project results (Laura Muhr, 2020) describe some knowledge and competences that are common to building owners. They usually have biases in their interpretation of the information they manipulate, they are missing knowledge about benefits of Energy Efficiency measures, about fundings, about how to use their building efficiently. **So, the lack of adequate information and building owner misunderstanding of concepts are perhaps something to develop when pushing forward well skilled workers.** As the definition of building owner encompass a lot of people with different interests and qualifications, a classification of those owners could be done.

The project document details the **EPC “end users”**, who are quite close to the home/building owner who are the focus in this report. They are sorted depending on:

- their relationship with the building: **owning**, (social) **renting**, **managing**, **occupying**,
- the **type of building** (e.g. multi-family/single-family),
- the **use of the building** (residential/non-residential/private or public, etc.).

Based on the analysis of EPC “end users” interests, the following categories seem to be useful to consider for this D3.5 report:

- A. Owner and occupant of a dwelling in multiple-family house,**
- B. Owner and occupant of an individual dwelling/house,**
- C. Building owners of public building/office,**
- D. Building owner and landlord of residential building.**

Their scope of actions and their interests are presented in Figure 2 (where EE means energy efficiency), the other boxes present are not related to building/homeowner, so they are removed from the sorting achieved in this report. It is important to figure out the relationship between the different roles in the Figure 2. For example, building managers of public and residential buildings and offices are valuable for exchanging information about energy efficiency measures, even if they are not directly proprietary. In addition, landlord and tenants interdependency is pointed out.

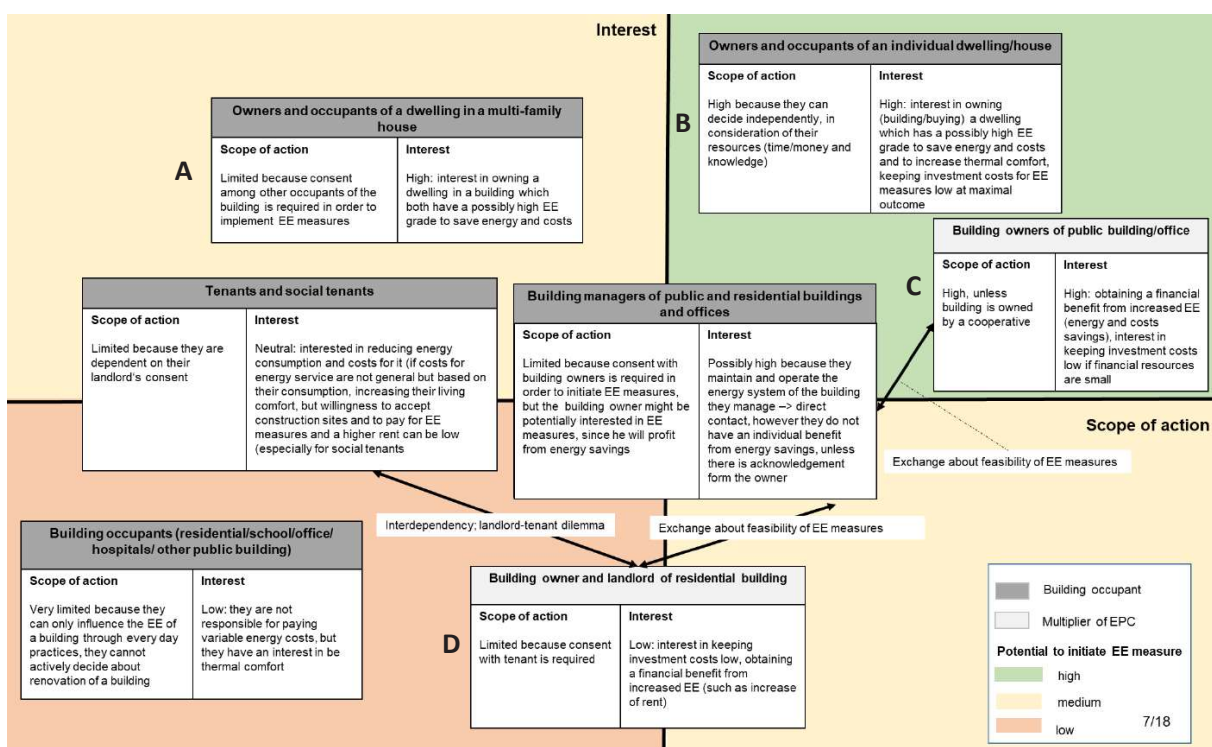
The four groups of building owners have obviously different interests and scope of action. On the one hand, **the owner of a complete building (B & C) can have a huge scope of actions** (e.g. easier to undertake works if you do not need agreement of tenants), and **a high interest in energy efficiency improvement** because they will decrease their energy use costs and/or receive higher loans. On the other hand, **owners of an apartment in large buildings (A) have lower lever of actions because of required consent of other occupants.** Ultimately, **the landlords renting their residential buildings (D) have lower interests and have to cope with the tenant and their willingness to afford some higher rent after renovation.** The building owner/user interests showed in the project are predominantly economic, the effect on comfort is also mentioned and the environment takes more generally a back seat.

In the following chapter, some of the categories of owner are surveyed as visible in Table 1. The first column ‘Survey’ refers to the next sections of this report, where each survey is presented in details.

Table 1: Homeowner category for the analysed surveys

| Survey | Principal homeowner cat. | Minority homeowner cat. |
|-----------------------|------------------------------|-------------------------|
| § 3.1 PLURAL project | Unknown | <i>Non applicable</i> |
| § 3.2 UIPI survey | Dwelling owner cat. A. and B | Landlord cat. D |
| § 3.3 INSTRUCT survey | Dwelling owner cat. A. and B | <i>Non applicable</i> |
| § 3.4 Demo 5 feedback | Dwelling owner cat. A. and B | <i>Non applicable</i> |

The Figure 2 below shows that tenants and building occupants (even if they are not owning the property) can also have a significant ‘scope of action’, despite a lower ‘interest’ is low according to the figure. It is obvious that the energy crisis is pushing forward the interest of tenants to have an energy efficient building.


Figure 2: Type of end users and their interests and scope of actions (Laura Muhr, 2020)

3. Studies and surveys on building owner's expectations

Based on the context detailed above, some surveys on building owner expectations have been analysed and are presented in the following sections §3.1 and §3.2. We then present the survey built and managed as part of INSTRUCT T3.5 (§3.3).

3.1 PLURAL project survey results

A small number of answers to a 1-year lasting survey has been analysed in the frame of the PLURAL project², it gathers the people opinion about the most important factor for building renovation. A total of 4 building owners and 7 occupants have answered the survey (mainly in Greece), this shows it is particularly difficult to find some persons giving their opinion about their building energy concerns. Without any surprise the cost of renovation is the most important factor compared to the others. Reduction of energy consumption comes after, then the thermal comfort and the environmental impact at a lower place. Other factors are treated but not so relevant for the current project (renovation time, visual comfort). This research work has been achieved by the national technical University of Athens, Greece. Most of the answers come from Greece despite the European audience of the survey. A local contact has much more impact on the people willingness to respond to the survey.

3.2 UIPI homeowner survey

UIPI (International Union of Property owners) has deployed an international survey in Europe for property owners on their capacity and willingness to renovate their buildings³. It was available between January and March 2021 and reached 10 450 respondents. This survey, compared to the other ones (PLURAL) detailed in this report has clearly a sufficient audience to draw some consistent conclusions about the building owners' expectations (before energy crisis). The results are presented in an online report (Causse, Figueira, Gutiérrez, & Panagiotopoulou, 2021), this paragraph details the most important items related to INSTRUCT project objectives amongst all other goals of this survey: *"gather information about how property owners perceive home renovation and if they are properly informed about it - about its relevance in fighting climate change and improving living conditions and what is the opinion of property owners on those matters. Also, it intends to explore property owners' intentions to renovate and what tools they have available to proceed in renovation and/or if there is lack of such means regarding information, specialised services, available budget, and financial tools"* (Causse, Figueira, Gutiérrez, & Panagiotopoulou, 2021).

First, the owner classification is central when assessing owner expectations. **Around 70% of respondents are homeowner** (no difference between dwelling size – multiple, single-family house), so the results are more likely to be associated to non-professional **residential building owners**. Only

² <https://www.plural-renovation.eu/> Accessed on the 2nd November 2022

³ <https://www.uipi.com/uipi-assesses-european-property-owners-capacity-and-willingness-to-renovate/>



a **minority of responding landlords** (25% of respondent) own more than two properties. From a geographical point of view most of answers come from Northern and Central Europe (10% of respondent in Southern countries).

Secondly, the renovation planned by the building owner is mainly focused on insulation (particularly windows) and thermal installations as stated in Figure 3. This makes sense according to the value chain defined in INSTRUCT D3.4⁴ emphasizing the impact of works on the main energy use in residential buildings (i.e. space heating).

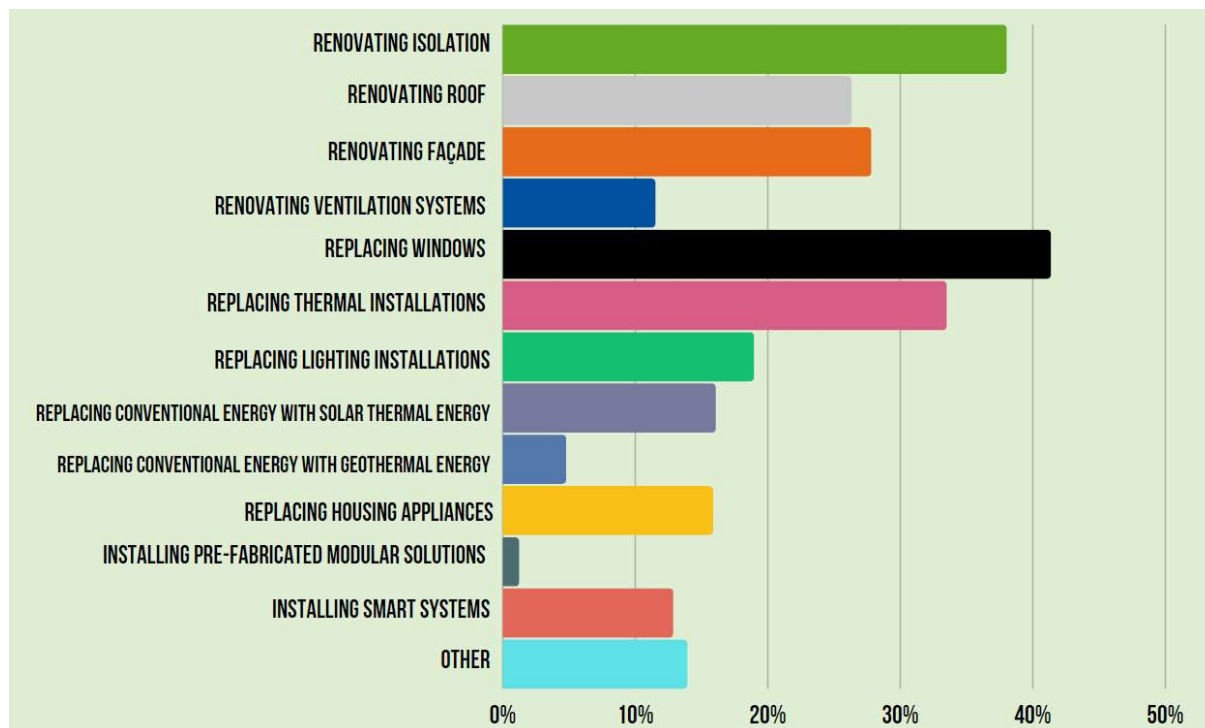


Figure 3: UIPI survey: type of renovations planned in percentage of respondents (Causse, Figueira, Gutiérrez, & Panagiotopoulou, 2021)

Then, 77% of respondents find it is beneficial to make their properties more energy efficient. The four main goals (descending order) are: **Increase the rental or property value, saving money, increase comfort, benefit for the environment**. On the other hand, some reasons are emphasized for not doing renovations. **44% thinks they do not need renovation, 31% are facing economic constraint to renovate, 10% have a lack of information and 6% indicates a lack of qualified services**. Other reasons are possible disturbance of tenants and the small benefits compared to the costs. But this last point is certainly less relevant since 2021. The lack of qualified services is not the main barrier encountered by the homeowners. Cost is the main barrier mentioned, the incentives proposed are therefore mostly dealing with funding/cost/tax of renovation work as showed in Figure 4.

The survey clearly shows that a tailored renovation policy can tackle **adequately the renovation costs**. Some **other important features** are also emphasized in Figure 4:

⁴ INSTRUCT Deliverable D3.4 „Awareness raising methodology towards energy efficiency value chain”

- Access to the adequate technical information for building owner and landlords. This can be achieved by one stop shops (one place for all information).
- Effectively manage the relationship between landlord and tenant (loan schemes, ...) in single and multiple family buildings.

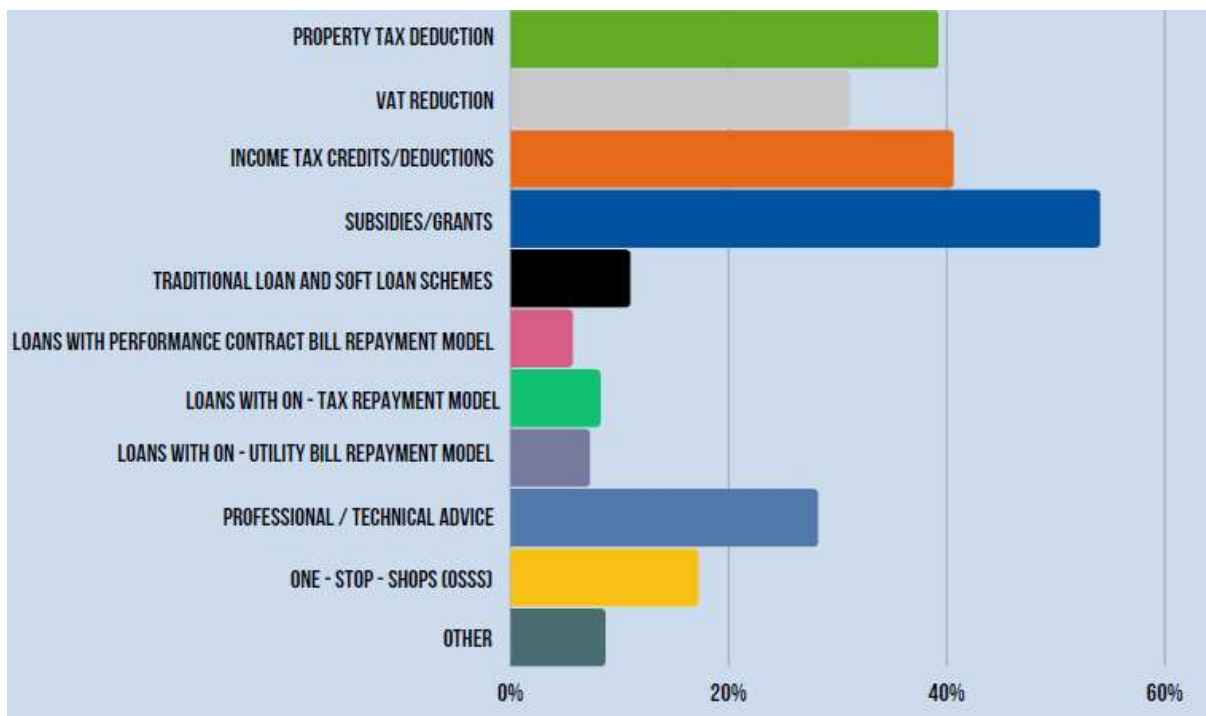


Figure 4: UIPI survey: incentives to motivate renovations in percentages of respondents (Causse, Figueira, Gutiérrez, & Panagiotopoulou, 2021).

The survey main conclusion is about the needs of building owners: *“what people and homeowners need, is to feel confidence, certainty and security, something that is achievable with the right policies and cooperation between all relevant stakeholders.”* (Causse, Figueira, Gutiérrez, & Panagiotopoulou, 2021).

Raising awareness is also an important point, the energy crisis has certainly put the energy efficiency on the front of the stage!

3.3 Homeowner survey INSTRUCT project

3.3.1 Methodology

To catch people opinion at large scale, in 2022, an online survey entitled *“Energy efficiency renovations in my home, satisfaction survey”* has been created. It is based on the findings of the previous studies and on INSTRUCT project objectives. It has been **widespread in Europe** via the following communication channels:

- BuildUp platform⁵,

⁵<https://www.buildup.eu/en/news/give-your-opinion-energy-renovation-your-home> accessed 2nd November 2022

- ECTP platform⁶,
- LinkedIn INSTRUCT project page⁷,
- LinkedIn page of some partners and researchers (e.g. LIST⁸, DDTN⁹),
- Some project partners Facebook's accounts.

The main objective of the survey is to **catch building owners' opinion about the skills of workers in relation with energy efficiency**, particularly single or multifamily private owners. These were not directly involved in the UIPI survey described above. Questions have been created to be answered easily by a building owner, as a collection of closed (mandatory) and opened (optional) questions. The energy performance related renovation phase is emphasized because this phase is associated to interactions the owner had got with the workers.

In order to know the expectations of buildings and homeowners with relation to the skills of workers, the questions are asked gradually to know a little bit more their renovation project context. The survey is thus divided into three parts:

- 1 **Project information** (country of the building, simple description of renovation works).
- 2 **Evaluation of the work carried out** (cost, availability of companies, quality).
- 3 **Training of the people** involved in the renovation project.

This last part is really the heart of INSTRUCT project, the answers will help making recommendations.

To facilitate the process of filling the survey and collect a large number of answers, the following elements can be emphasized:

- No **personal data is collected**, so there is no particular agreement to be validated by the respondent. We hope this facilitates the respondent to fill up the complete survey and send his/her answer. Besides, this does not allow us to give feedback nor to ask additional questions to people willing to share their experience with construction workers.
- The survey is proposed in **six languages** according to the project partners' languages (English, German, Finnish, French, Italian and Polish).
- The writing is gender neutral.
- The time expected to fill in the survey is **around five minutes** (results show an average time of five minutes and half).
- The survey has been created in Office forms, this tool has a good name recognition, and proposes the survey language according to the user account language (when available).

Despite the widespread channels, the low number of replies has been encountered (25). It is hard to get people giving their opinion. Some recommendations for better involvement are presented in section 3.3.3.

⁶<https://www.ectp.org/news-events-newsletters/news/news-detail/give-your-opinion-on-the-energy-renovation-of-your-home/> accessed 2nd November 2022

⁷ https://www.linkedin.com/posts/instructproject_fill-r%C3%A9novation-%C3%A9nergie%C3%A9tigue-de-mon-habitation-activity-6979064167169208322-CkB6?utm_source=share&utm_medium=member_desktop
Accessed 2nd November 2022

⁸ <https://www.linkedin.com/feed/update/urn:li:activity:6984149023825797122> Accessed 2nd November 2022

⁹ <https://bit.ly/3EiwU83> Accessed 17th November 2022



3.3.2 Results

This section presents the results of the survey, it has been launched on the 22nd of September 2022 and closed on the 03rd of November 2022. First, the project information is requested. Among those who responded, the location of buildings renovated is as follows: **Belgium (14), France (6), Luxembourg (3), Finland (1), Italy (1)**. The main answers are from Belgium. It should be mentioned that the researchers driving the survey are working at LIST and live mainly in Belgium. So, a clear number of answers is linked to the relationship of the respondent to the ones asking to fill in the questionnaire.

The **works undertaken** in responders' projects are detailed as follows (multiple answers were allowed), it is essential to understand the type of renovation done, to better know the professionals involved:

- Increase in the size of your home (5)
- Insulation of walls (15)
- Replacement of windows (16)
- Installation of photovoltaic panels (7)
- Installation of a wood/pellet stove (6)
- Renovation of the heating or hot water system (19)
- Other (4)

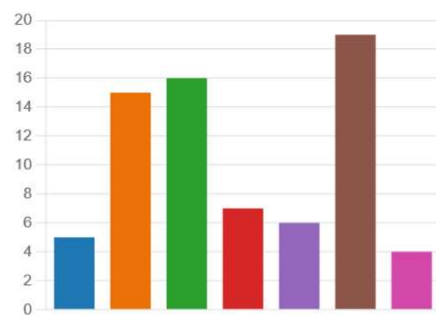


Figure 5: INSTRUCT survey: works carried out

The last field 'Other' contains roof insulation, cogeneration heating unit (multifamily), solar thermal panels and ventilation system.

The results show that the people are doing more than one renovation work (2.88 mean value).

Most of the respondents (80%) have modified/renovated the system for heating their building. "Installation of a wood/pellet stove" are also considered by the responders. Envelope renovation is also important (80%) and implies nearly equally the windows and opaque surfaces insulations. Most people combine heating and envelope works (64%). Renewable energy (wood, photovoltaic and solar thermal panels) represents 40% of the projects. 80% of projects dealing with building size increase emphasize the energy efficiency work achieved.

The information access (to know the type and content of the work to be carried out) has been surveyed, from 1 (easy access) to 5. There is no specific tendency about the information access, the mean value is 2.88 with a Gaussian-like distribution. This is the same for the company's availability (1: Easy access, 5: Difficult access) with a mean value of 2.72. There is still the same trend for the speed of work (1: slow to 5: fast) where the average is 2.72. For the cost (1: affordable – 5: expensive), the mean value is 3.88 signifying the **responders find expensive to boost the energy performance of the building**. Besides no one answered "1". Despite it is expensive, the responders appreciate the impact of the work on energy consumption (from 1: Not satisfied, 5: very satisfied – mean value encountered 3.8).

As the survey is run in a very turbulent period for energy prices, one question emphasizes the choice of renovation undertaken: *“Given the current situation (rising energy prices), would you make the same renovation choices again?”* Answers from 1: not at all, to 5: totally. The mean value is very high (4.32) **indicating the respondents are confident with the choice of renovation they did and their impact.**

After focusing on energy aspects, the last set of questions is related to the training/skills of the workers involved in the renovation projects. First, a closed question can orientate the discussion about skills: *In your opinion, were the professionals who worked on your project sufficiently skilled?* The answer required a choice between 1: bit skilled, to 5: very skilled. The average value entered is 3.64. **Based on the respondents’ answers, there were no significant lack of skills of the workers.**

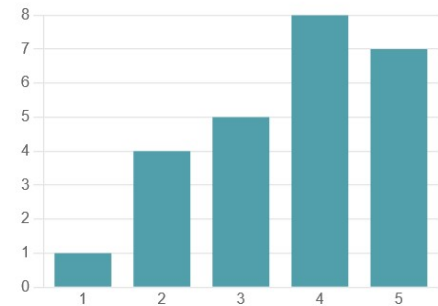


Figure 6: INSTRUCT survey - skills of workers (1: not very skilled - 5: very skilled)

The question is followed by an open question to elaborate about the previous answer. Globally there were not many complaints about the quality of the workers nor the advice from designers. Nevertheless, some individual comments are worth mentioning here:

- Lack of knowledge of new sustainable insulation material.
- Lack of knowledge on airtightness of buildings, no understanding of the work of other professionals and possible alterations.
- Lack of life cycle view of the work, in particular regarding the maintenance (easy to install a new boiler but hard to explain how to use it and maintain it).
- + Availability of an energy auditor/coach to choose the works to be carried out.
- + Building owner involved in the work of his/her building, this improves the work follow-up.
- + Digitalisation of the companies help choosing the adequate stakeholder, speed up the process.

More than the half of the responders left a comment to this question, this means they were interested in the survey and wanted to say something!

It was asked if the responder paid attention to the quality labels/certificates of the companies. The average value is 2.28 and the distribution is presented in Figure 7. **The certification/labelling is not a priority for the people.** Those who answered 5 explained that in their cases the certification was required to obtain subsidies. The other comments described that the choice is mainly guided by relative’s recommendations.

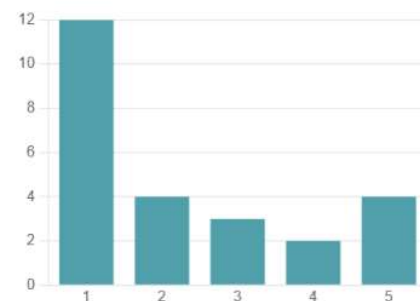


Figure 7 : INSTRUCT survey - importance of certified/labelled companies (1: I did not pay attention to - 5: I paid attention)

A question of work coordination is also proposed, the average answer is 3.2 (1: bad coordination – 5: good coordination). No trend is deduced from this question. There are two potential coordination techniques based on

the responder's comments: coordination by the building owner or by an architect. This question makes sense because of multiple stakeholders involved in the project.

The last question is an opened one about **what to do to improve the quality of the work carried out by the companies**. 44% of responders gave some insights. We report below on individual items that can be linked to INSTRUCT project objectives:

- ❖ Better communication skills with the customer and the other companies.
- ❖ Trained people on new materials.
- ❖ Better owner access to information and documentation related to the works.
- ❖ Identify the companies on a single website to allow centralising subsidies.
- ❖ Sensibilisation of all stakeholders to energy efficiency.
- ❖ Better management of workers on site by their supervisor.
- ❖ More info on the HVAC equipment operation and maintenance (not only equipment installation).

From those items, some recommendations could be elaborated.

- Firstly, **communication skills and data management** could be further developed to better transmit adequate information to the customer and between companies. Data management is also important for the operation phase of the building (e.g. maintenance of boiler) to reach high performance.
- Secondly, a **better update of knowledge of new materials/components and equipment** (building material/equipment evolve quicker than construction companies) to install them correctly and to advice adequately the customer.
- Finally, based on the 25 answers received, the **improvement lies in the organisation of the work** and not in the work itself. The building owner expects a better building (i.e. less energy consumption) after undertaking renovation works. He/She wants an efficient renovation process (data based, coordinated, quick, cost effective) to achieve the expectations.

3.3.3 Lessons learned

On a methodological point of view, some lessons can be learned from this survey, including possible improvements to the survey itself.

The responders gave valuable information in the opened questions, it would have been interesting to gather their email addresses to contact them. This could only be done in compliance with GDPR regulation.

We had a low number of responders despite our motivation and the multiple channels used. It is hard to get people giving their opinion if we are not directly linked with them. This implied all the project team to investigate on his personal (close) network. We could have established some targeted answers number by project partners to catch more people. Another idea could be to offer something to the people who answer.

As the close contact with building owner is a prerequisite for having answers, we could have established closer contacts with: owner organisation at local level, municipalities.



We could also have distinguished the different construction companies (HVAC, insulation, ...) in the survey answers, in order to have a separate set of recommendations according to the stakeholder category. This is important as the renovation combines many works from several stakeholders.

3.4 Lessons learned from INSTRUCT Demo 5 (WP4.5)

The Demo 5 in WP4 deals with some building owners' raising awareness events. Two effective meetings arranged in September-October 2021 involved homeowners to discuss about the Superbonus incentive detailed in INSTRUCT Deliverable D3.3, and the opportunity to undertake energy efficiency interventions on existing buildings. In those meetings, particularly in the Q&A session, the opinions of building owners were gathered, and the following points came up:

- A remarkable interest for the functioning and requirements of the fiscal incentive, especially when it comes to the legal-economic side to access the measure. Less attention was put on the quality and technical skills needed to perform energy efficiency works.
- Some issues to distinguish between energy efficiency interventions and other typologies of renovation works, which are not covered by the fiscal incentive (i.e. painting works of the external facades).
- General consensus on the need for several professional background and profiles to manage renovation interventions and the procedures required: designers, installers, auditors, but also economic-legal professionals, such as accountants, were equally considered.

The two first points remind us that **a major concern of building owner is the way to finance the renovation** (and especially energy improvement). The last point emphasizes the awareness of the required interactions between homeowners and other stakeholders/experts, a crucial point when considering the Superbonus incentive, which is a quite complex measure to be understood and addressed by end-users and owners of residential buildings.

4. References

- Causse, E., Figueira, M., Gutiérrez, B. i Panagiotopoulou, I. (2021, April). *UIPI Survey Final Report*. Brussels.
- Muhr, L. (2021). *EPANACEA Project Fact sheet on energy-related behaviour patterns in the context of buildings*. IZES gGmbH – Institut für Zukunftenergie und Stoffstromsysteme.
- Laura Muhr, S. C. (2020). *EPANACEA Project Stakeholder Analysis Report*. IZES gGmbH – Institut für Zukunftenergie und Stoffstromsysteme.



5. Appendices

Annex 1: INSTRUCT online survey: complete raw results.

Link

[https://asmpl.sharepoint.com/:x:/r/sites/INSTRUCTProject/Shared%20Documents/WP3%20\(Leader%20-%20LIST\)/T3.5/D3dot5%20annex%201%20INSTRUCT%20survey%20raw%20results.xlsx?d=wf392705bc12e415b9e3a945b8bfa9d29&csf=1&web=1&e=UjHyEy](https://asmpl.sharepoint.com/:x:/r/sites/INSTRUCTProject/Shared%20Documents/WP3%20(Leader%20-%20LIST)/T3.5/D3dot5%20annex%201%20INSTRUCT%20survey%20raw%20results.xlsx?d=wf392705bc12e415b9e3a945b8bfa9d29&csf=1&web=1&e=UjHyEy)

Annex 2: INSTRUCT online survey questions and translations in 6 languages.

FRENCH

Rénovation énergétique de mon habitation, suis-je satisfait(e) ?

Dans le cadre du projet Européen INSTRUCT (No. 894756 <https://instructproject.eu>), le LIST (Luxembourg Institute of Science and Technology) souhaite récolter votre avis sur la qualité de la rénovation énergétique de votre logement.

Ce questionnaire s'adresse exclusivement aux propriétaires de bâtiments qui ont effectué une rénovation énergétique de leur habitation.

Merci de participer à cette étude. Ce questionnaire est utilisé uniquement à des fins de recherche dans le cadre du projet INSTRUCT. Toutes les données sont collectées de manière anonyme et seront traitées de manière confidentielle.

Un peu d'information sur votre projet

Votre pays de résidence

Quels travaux avez-vous effectué?

Augmentation de la surface de votre logement

Isolation de parois

Remplacement de châssis

Installation de panneaux photovoltaïques

Installation d'un poêle à bois/pellets

Rénovation du système de chauffage ou d'eau chaude sanitaire

Autre à préciser via le champs suivant

Précisez les travaux effectués s'ils ne sont pas présents dans la liste précédente

Avez vous eu un accès facile à l'information sur le type et le contenu des travaux à réaliser ?

Accès aisé

Accès compliqué

Evaluation des travaux effectués

Disponibilité des entreprises

Peu disponible

Très disponible

Rapidité de la conception/mise en œuvre de l'intervention

Lent

Rapide

Coût de l'intervention

Abordable



Coûteux

Impact de la rénovation sur la réduction de la consommation d'énergie

Pas satisfait

Très satisfait

Compte tenu de la situation actuelle (hausse des prix de l'énergie), referiez-vous les mêmes choix de rénovation?

Non pas du tout

Oui tout à fait

Formation des personnes impliquées dans le projet de rénovation

Considérez-vous que les professionnels qui sont intervenus sur votre chantier disposaient des compétences suffisantes?

Peu compétent

Très compétent

Pouvez-vous nous en dire plus ?

Avez-vous été attentif(ve) aux labels/certificats de qualité des entreprises ?

Peu attentif

Très attentif

Pouvez-vous nous en dire plus ?

L'activité des divers intervenants a-t-elle été bien coordonnée ?

Mauvaise coordination

Bonne coordination

Pouvez-vous nous en dire plus ?

Selon vous, que peut-on mettre en œuvre pour l'amélioration de la qualité du travail réalisé par les entreprises

Merci

Pour toute question relative au projet, n'hésitez pas à nous contacter aux adresses suivantes : sebastien.thomas@list.lu ou sylvain.kubicki@list.lu. Si vous nous contactez, vos données personnelles seront traitées conformément à la politique de confidentialité du LIST disponible au lien suivant : <https://www.list.lu/en/privacy-notice/>



ENGLISH

Energy renovation of my home, am I satisfied?

Within the framework of the European project INSTRUCT (No. 894756 <https://instructproject.eu>), the LIST (Luxembourg Institute of Science and Technology) would like to collect your opinion on the quality of the energy renovation of your home.

This questionnaire is exclusively addressed to building owners who have carried out an energy renovation of their home.

Thank you for participating in this survey. This questionnaire is only used for research purposes within the INSTRUCT project. All data is collected anonymously and will be treated confidentially.

Some information about your project

Your country of residence

What work have you done?

Increase in the size of your home

Insulation of walls

Replacement of windows

Installation of photovoltaic panels

Installation of a wood/pellet stove

Renovation of the heating or hot water system

Other to be specified via the following field

Specify the work carried out if it is not present in the previous list

Did you have easy access to information on the type and content of the work to be carried out?

Easy access

Difficult access

Evaluation of the work carried out

Availability of companies

Not very available

Very available

Speed of design/implementation of work

Slow

Fast

Cost of work

Affordable

Expensive

Impact of renovation on reducing energy consumption

Not satisfied

Very satisfied

Given the current situation (rising energy prices), would you make the same renovation choices again?

No not at all

Yes, totally

Training of the people involved in the renovation project

Do you consider that the professionals who worked on your project were sufficiently skilled?

Not very qualified

Very qualified

Can you tell us more?

Did you pay attention to the quality labels/certificates of the companies?



I did not pay attention to

I paid attention

Can you tell us more?

Was the activity of the various stakeholders well coordinated?

Poor coordination

Good coordination

Can you tell us more?

In your opinion, what can be done to improve the quality of the work done by the companies

Thank you

If you have any questions about the project, please contact us at sebastien.thomas@list.lu or sylvain.kubicki@list.lu. If you contact us, your personal data will be treated in accordance with the LIST privacy policy available at the following link: <https://www.list.lu/en/privacy-notice/>

FINNISH

Kotini energiaremontti, olenko tyytyväinen?

Eurooppalaisen INSTRUCT-hankkeen (nro 894756 <https://instructproject.eu>) puitteissa LIST (Luxembourg Institute of Science and Technology) haluaa kerätä mielipiteesi kotisi energiaremontin laadusta.

Tämä kyselylomake on tarkoitettu yksinomaan kiinteistönomistajille, jotka ovat tehneet taloonsa energiaremontin.

Kiitos osallistumisestasi tähän kyselyyn. Tätä kyselylomaketta käytetään vain tutkimustarkoituksiin INSTRUCT-projektissa. Kaikki tiedot kerätään anonymisti ja niitä käsitellään luottamuksellisesti.

Perustietoja projektistasi

Asuinmaasi

Mitä remontteja olet tehnyt?

Lisäitkö kotisi kokoa?

Seinien eristys

Vaihdettiinko ikkunoita?

Asennettiin aurinkopaneeleita?

Asennettiin takka/pellettipoltin

Uudistettiin lämmitys- tai käyttövesijärjestelmä?

Muut määrittelemättömät parannukset

Yksilöi tehty parannus, jos sitä ei ollut edellisessä luettelossa

Saitko helposti tietoa suoritettavan työn tyypistä ja sisällöstä?

Helposti

Vaikeasti

Arviointi tehdystä työstä

Yritysten saatavuus

Huonosti saatavilla

Hyvin saatavilla

Suunnittelun/töiden toteuttamisen nopeus

Hidas

Nopea

Työn hinta

Edullinen



Kallis

Peruskorjauksen vaikutus energiankulutuksen vähentämiseen

Tyytymätön

Erittäin tyytyväinen

Tekisitkö samoja korjausvalintoja nykytilanteessa (energian hinnan nousu) huomioon ottaen?

Ei ei ollenkaan

Kyllä, täysin

Peruskorjausprojektiin osallistuvien henkilöiden osaaminen

Ovatko projektissasi työskennelleet ammattilaiset mielestäsi riittävän ammattitaitoisia?

Ei kovin päteviä

Erittäin päteviä

Haluatko tarkentaa?

Kiinnititkö huomiota yritysten laatumerkkeihin/sertifikaatteihin?

En kiinnittänyt huomiota

Kiinnitin huomiota

Haluatko tarkentaa?

Oliko eri toimijoiden yhteistyö hyvin koordinoitua?

Huonosti koordinoitu

Hyvin koordinoitu

Voitko kertoa meille lisää?

Mitä mielestäsi voitaisiin tehdä yritysten tekemän työn laadun parantamiseksi?

Kiitos.

Jos sinulla on kysyttävää projektista, ota yhteyttä osoitteeseen sebastien.thomas@list.lu tai sylvain.kubicki@list.lu. Jos otat meihin yhteyttä, henkilötietojasi käsitellään LIST-tietosuojakäytännön mukaisesti, joka on saatavilla seuraavasta linkistä: <https://www.list.lu/en/privacy-notice/>



GERMAN

Energetische Renovierung meiner Wohnung, bin ich zufrieden?

Im Rahmen des europäischen Projekts INSTRUCT (Nr. 894756 <https://instructproject.eu>) möchte das LIST (Luxembourg Institute of Science and Technology) Ihre Meinung über die Qualität der energetischen Renovierung Ihres Hauses einholen.

Dieser Fragebogen richtet sich ausschließlich an Gebäudeeigentümer, die eine energetische Renovierung ihres Hauses durchgeführt haben.

Vielen Dank, dass Sie an dieser Umfrage teilnehmen. Dieser Fragebogen wird ausschließlich zu Forschungszwecken im Rahmen des INSTRUCT-Projekts verwendet. Alle Daten werden anonym erhoben und vertraulich behandelt.

Ein paar Informationen zu Ihrem Projekt

Ihr Land, in dem Sie leben

Welche Bauarbeiten haben Sie durchgeführt?

Vergrößerung der Wohnfläche Ihrer Wohnung

Isolierung von Wänden

Austausch von Fenster

Installation von Photovoltaikanlagen

Einbau eines Holz-/Pelletofens

Renovierung des Heizungs- oder Warmwassersystems

Sonstiges bitte über das folgende Textfeld angeben

Geben Sie die durchgeführten Bauarbeiten an, wenn sie nicht in der vorherigen Liste enthalten sind.

Hatten Sie leichten Zugang zu Informationen über die Art und den Inhalt der durchzuführenden Bauarbeiten?

Leichter Zugang

Komplizierter Zugang

Bewertung der durchgeführten Bauarbeiten

Verfügbarkeit der Unternehmen

Wenig verfügbar

Sehr verfügbar

Schnelligkeit der Planung/Durchführung der Aufgabe

Langsam

Schnell

Kosten der Aufgabe

Erschwinglich

Teuer

Auswirkungen der Renovierung auf die Verringerung des Energieverbrauchs

Nicht zufrieden

Sehr zufrieden

Würden Sie angesichts der aktuellen Situation (steigende Energiepreise) wieder die gleichen Renovierungsentscheidungen treffen?

Nein überhaupt nicht

Ja sehr

Ausbildung der am Renovierungsprojekt beteiligten Personen



Sind Sie der Meinung, dass die Fachleute, die an Ihrem Projekt beteiligt waren, über ausreichende Kompetenzen verfügten?

Wenig kompetent

Sehr kompetent

Können Sie uns mehr darüber sagen?

Haben Sie auf die Qualitätssiegel/-zertifikate der Unternehmen geachtet?

Wenig aufmerksam

Sehr aufmerksam

Können Sie uns mehr dazu sagen?

Wie gut wurden die Aktivitäten der verschiedenen Beteiligten koordiniert?

Schlechte Koordination

Gute Koordination

Können Sie uns mehr dazu sagen?

Was kann Ihrer Meinung nach zur Verbesserung der Qualität der von den Unternehmen ausgeführten Arbeit getan werden?

Wenn Sie Fragen zum Projekt haben, können Sie uns gerne unter folgenden Adressen kontaktieren: sebastien.thomas@list.lu oder sylvain.kubicki@list.lu. Wenn Sie uns kontaktieren, werden Ihre persönlichen Daten gemäß der Datenschutzrichtlinie des LIST behandelt, die unter folgendem Link abrufbar ist: <https://www.list.lu/en/privacy-notice/>



ITALIAN

Ristrutturazione energetica della mia casa, sono soddisfatto?

Nell'ambito del progetto europeo INSTRUCT (n. 894756 <https://instructproject.eu>), il LIST (Istituto lussemburghese di scienza e tecnologia) desidera raccogliere la vostra opinione sulla qualità della ristrutturazione energetica della vostra casa.

Questo questionario è rivolto esclusivamente ai proprietari di immobili che hanno effettuato una ristrutturazione energetica della propria abitazione.

Grazie per aver partecipato a questo sondaggio. Questo questionario viene utilizzato solo per scopi di ricerca nell'ambito del progetto INSTRUCT. Tutti i dati sono raccolti in forma anonima e saranno trattati in modo confidenziale.

Alcune informazioni sul vostro progetto

Il vostro paese di residenza

Che lavoro ha fatto?

Aumento delle dimensioni della casa

Isolamento delle pareti

Sostituzione di finestre

Installazione di pannelli fotovoltaici

Installazione di una stufa a legna/pellet

Ristrutturazione dell'impianto di riscaldamento o di produzione di acqua calda

Altro da specificare tramite il seguente campo

Specificare il lavoro svolto se non è presente nell'elenco precedente

Avete avuto facile accesso alle informazioni sul tipo e sul contenuto del lavoro da svolgere?

Accesso facile

Accesso difficile

Valutazione del lavoro svolto

Disponibilità delle aziende

Non molto disponibile

Molto disponibile

Velocità di progettazione/attuazione dell'intervento

Lento

Veloce

Costo dell'intervento

Conveniente

Costoso

Impatto della ristrutturazione sulla riduzione del consumo energetico

Non soddisfatto

Molto soddisfatto

Vista la situazione attuale (aumento dei prezzi dell'energia), rifarebbe le stesse scelte di ristrutturazione?

No, per niente

Sì, molto

Formazione delle persone coinvolte nel progetto di ristrutturazione



Ritiene che i professionisti che hanno lavorato al suo progetto fossero sufficientemente qualificati?

Non molto competente

Molto competente

Può dirci di più?

Avete prestato attenzione ai marchi/certificati di qualità delle aziende?

Non molto attento

Molto attento

Può dirci di più?

L'attività delle varie parti interessate è stata ben coordinata?

Scarsa coordinazione

Buona coordinazione

Può dirci di più?

Secondo lei, cosa si può fare per migliorare la qualità del lavoro svolto dalle aziende?

Per qualsiasi domanda sul progetto, contattateci all'indirizzo sebastien.thomas@list.lu o sylvain.kubicki@list.lu. Se ci contattate, i vostri dati personali saranno trattati in conformità con l'informativa sulla privacy di LIST disponibile al seguente link: <https://www.list.lu/en/privacy-notice/>



POLISH

Remont mojego domu w kontekście poprawy efektywności energetycznej, czy jestem zadowolony?

W ramach europejskiego projektu INSTRUCT (nr 894756 <https://instructproject.eu>), LIST (Luksemburski Instytut Nauki i Technologii) chciałaby zebrać Państwa opinię na temat jakości remontu Państwa domu.

Niniejsza ankieta skierowana jest wyłącznie do właścicieli budynków, którzy przeprowadzili remont związany z poprawą efektywności energetycznej swojego domu (np. ocieplenia, specjalne instalacje, itp.).

Dziękujemy za udział w tej ankiecie. Niniejszy kwestionariusz jest wykorzystywany wyłącznie do celów badawczych w ramach projektu INSTRUCT. Wszystkie dane są zbierane anonimowo i będą traktowane jako poufne.

Kilka informacji o Państwa projekcie

Pana/Pani kraj zamieszkania

Jakie prace wykonał Pan/wykonała Pani?

Zwiększenie powierzchni domu

Izolacja ścian

Wymiana okien

Instalacja paneli fotowoltaicznych

Instalacja pieca na drewno/pellet

Renowacja systemu ogrzewania lub ciepłej wody użytkowej

Inne, które należy określić w poniższym polu

Proszę podać inne wykonane prace, jeśli nie ma ich na poprzedniej liście

Czy miał/a Pan/Pani łatwy dostęp do informacji o rodzaju i charakterystyce wykonywanych prac?

Łatwy dostęp

Trudny dostęp

Ocena wykonanej pracy

Dostępność firm

Niezbyt dostępna

Bardzo dostępna

Szybkość projektowania/realizacji prac

Powolne

Szybko

Koszt pracy

Przystępny

Drogi

Wpływ remontu na zmniejszenie zużycia energii

Nie jestem zadowolony

Bardzo zadowolony

Czy biorąc pod uwagę obecną sytuację (wzrost cen energii), dokonałby Pan/dokonałaby Pani ponownie tych samych wyborów dotyczących remontu?

Nie, w ogóle nie

Tak, całkowicie

Szkolenie pracowników zaangażowanych w tego typu projekty remontowe.

Czy uważasz, że fachowcy, którzy pracowali nad Pana/Pani projektem byli wystarczająco wykwalifikowani?



Nie bardzo wykwalifikowani

Bardzo dobrze wykwalifikowani

Czy może nam Pan/Pani powiedzieć coś więcej?

Czy zwracał/a Pan/Pani uwagę na znaki jakości/certyfikaty firm?

Nie zwracałem uwagi na

Zwróciłem uwagę

Czy może Pan/Pani powiedzieć nam więcej?

Czy działalność różnych podmiotów (dostawcy, instalatorzy, projektanci) była dobrze skoordynowana?

Słaba koordynacja

Dobra koordynacja

Czy może nam Pan/Pani powiedzieć coś więcej?

Co Pana/Pani zdaniem można zrobić, aby poprawić jakość pracy wykonywanej przez firmy?

Dziękuję.

Jeśli ma Pan/Pani jakiegokolwiek pytania dotyczące projektu, skontaktuj się z nami pod adresem sebastien.thomas@list.lu lub sylvain.kubicki@list.lu (język angielski) oraz l.wilczynski@asmresarech.pl (język polski) . W przypadku kontaktu z nami, Pana/Pani dane osobowe będą przetwarzane zgodnie z polityką prywatności ustawy RODO.



Glossary

| Acronym | Full name |
|----------------|---|
| CA | Consortium Agreement |
| EC | European Commission |
| EASME | The Executive Agency for Small and Medium-sized Enterprises |
| GA | Grant Agreement |
| PC | Project Coordinator |
| WP | Work Package |
| TL | Task Leader |
| DoA | Description of Action |
| PSC | Project Steering Committee |
| SQM | Scientific and Quality Manager |
| DEC | Dissemination and Exploitation Committee |
| KOM | Kick-off meeting |
| ASM | ASM – Market Research and Analysis Centre |
| VTT | Technical Research Centre of Finland |
| LIST | Luxembourg Institute of Science and Technology |
| RIL | Finnish Association of Civil Engineers |
| CU | Cardiff University |
| R2M | Research to Market Solution France |
| DTTN | Distretto Tecnologico Trentino |
| ENEFFECT | Center for Energy Efficiency EnEffect |
| GER | General Exploitable Result |
| AB | Advisory Board |
| PM | Person month |
| M | Month |





SKILLS
INSTRUCT
INSTRUMENTS
CONSTRUCTION



Evidence-based market and policy instruments implementation across the EU to increase the demand for energy skills across construction sector value chain.



www.instructproject.com



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 894756.