

Towards large-scale roll out of “integrated home renovation services” in Europe

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Keywords

existing residential buildings, households, building refurbishment, integrated home renovation services, one-stop-shops, financing

Abstract¹

In the residential sector, the market offer for sustainable energy upgrades is fragmented, composed of a myriad of micro and small companies, and mostly uncoordinated. Meanwhile, most homeowners lack the capacity to set-up and supervise complex and ambitious projects. Furthermore, many face obstacles in accessing the necessary up-front financial resources. As highlighted in the Renovation Wave initiative of the European Green Deal, there is a need to develop a coordinated and coherent response to the needs of homeowners, in order to make their renovation process as painless as possible.

In this paper, we present a review of various initiatives that aim at developing integrated service offers for the energy renovation of private housing. After clarifying the concept of *Integrated Home Renovation Services* and positioning it in the current market offer related to home renovation, we analyse each step of the customer journey and illustrate how the user experience could be improved, based on local experiences. We follow by proposing an empirical typology which identifies three main models: *advice*, *support* and *implementation*, and the provision of finance as an additional option. Finally, we discuss how

integrated home renovation services could be facilitated and rolled-out throughout the EU.

Introduction

The European Union has set the objective of climate neutrality by 2050, with an intermediate target in 2030 of halving its greenhouse gas emissions compared to those of 1990. As highlighted in the Renovation Wave initiative of the European Green Deal, this objective represents an additional investment in building renovation of EUR 90 billion every year until 2050². For the residential sector, this means at least **doubling the current rate of renovation, while significantly increasing the share of performing renovations and low energy renovations**³.

Although technical solutions are known and available, intervention in the residential sector remains very complex, in particular due to the ownership structure of the building stock. 70 % of the EU population own the home they live in⁴, while the remaining 30 % live in rental housing (with large variations depending on Member States). Even for rental housing, the share of professional owners (housing companies, social housing operators) remains relatively small compared to individual owners. This means that, in the vast majority of cases, **the de-**

1. The sole responsibility for the content of this article lies with the authors. It does not necessarily reflect the opinion of the European Climate, Infrastructure and Environment Executive Agency (CINEA) or the European Commission, which are not responsible for any use that may be made of the information contained therein.

2. See “A Renovation Wave for Europe – greening our buildings, creating jobs, improving lives”, SWD(2020) 550 final.

3. We refer broadly to performing renovations as renovations which deliver higher savings than the standard measures (e.g. replacing an old boiler); and to low energy renovations as renovations which reach a low energy standard, usually defined at national level. Both usually require insulating the building envelope.

4. EUROSTAT. Housing in Europe – statistics visualised. 2020 edition.

cision to proceed with home energy renovation belongs to non-professional homeowners, who are usually insufficiently informed, unskilled for their role and/or lacking the time to manage an energy renovation project, which is rarely their main priority.

In order to upscale home energy renovation, public policies usually focus on boosting demand through awareness raising, mandatory requirements, or by providing public subsidies and low interest loans. However, given the lack of capacity of homeowners to cope with the complexity of low energy renovation, we postulate that **home (low) energy renovation can only be upscaled if appropriate services are put in place on the supply side, in order to decrease the burden of renovation on homeowners**. This paper shows how the development of “Integrated Home Renovation Services” (IHRS) can provide a coordinated and coherent response to the needs of homeowners at each step of their customer journey, in order to make the renovation process as painless as possible.

After clarifying the concept of IHRS and positioning it in the current market offer related to home renovation, we analyse each step of the customer journey and illustrate how the user experience could be improved, based on local experiences⁵. We follow by proposing an empirical typology which identifies three main models: *advice*, *support* and *implementation*, and the provision of finance as an additional option. Finally, we discuss how integrated home renovation services could be facilitated and rolled-out throughout the EU.

Defining “Integrated Home Renovation Services”

HOME RENOVATION AS A “CUSTOMER JOURNEY”

What is the customer experience of homeowners renovating their home? The question is rarely tackled in the policy debate and, when asked, the answers suggest that many homeowners avoid renovating their home not only because of a lack of interest, but also because they are reluctant to engage in the process. **In most cases, homeowners manage the renovation process on their own**, which includes defining the energy savings measures, contracting with various construction companies, coordinating the worksite and taking delivery of the work. They are on their own to access a bank loan or mobilise subsidies. Some homeowners even perform all or part of the works themselves.

While from a homeowner’s point of view, home renovation is one coherent project, it is usually not seen as such by contractors or by public authorities, whose interventions are focused on specific aspects or moments of the project. In this context, **we define the customer journey as the sequence of interactions between a homeowner and all the stakeholders involved in the renovation**, from the homeowner’s point of view.

We could make an analogy between home renovation and a wedding⁶: for the bride and groom, their wedding is one single coherent project; but not for the actors involved (e.g. public authorities, religious authorities, caterers, hotels, travel agencies,

etc.), none having a clear interest in coordinating with the others. Although the bride and groom are usually inexperienced, they generally have to fill in the coordination gap, which is often a major source of stress. Wedding planners are often their best option to ensure a smooth and successful wedding experience.

Equivalent service integrators are needed to upscale home energy renovation. **Delegating part or all of the tasks for which homeowners are not well equipped, can make the renovation experience much more attractive**, and avoid that homeowners abandon their project or keep it to the simplest measures.

MAPPING THE CURRENT MARKET OFFER

A large number of professionals already offer renovation-linked services to homeowners. Figure 1 presents in rows what we consider to be the main steps in the customer journey and, in columns, the main types of actors involved in the housing sector. Where rows and columns meet, we indicate to what extent the expected services appear to be a core business, a secondary or a marginal activity for the type of actor considered. It should be noted that, **while we present the customer journey in a very sequential manner, in practice several of these steps are conducted in parallel**, possibly with several iterations at certain stages.

The mission of supporting individuals with project design, selection of companies, worksite supervision and acceptance of the work is typically the activity of **architects, energy auditors and engineers**, possibly in association. By definition, architects and engineers provide independent advice, analyse quotations and coordinate the renovation works, working in the best interest of their clients. However, this independence means that they are not in a position to carry out the work themselves, or to offer finance. The support of architects and engineers is usually needed for low energy renovations, but its costs remain a barrier except where it is subsidised (e.g. KfW programmes in Germany).

In the majority of cases, **craftspeople and installers** are the first entry point of homeowners into an energy renovation journey. The primary motivation for contacting them varies greatly and is not necessarily that of saving energy. Craftspeople and installers are very often called to (urgently) repair or replace faulty equipment. In many cases, they are contacted for a project aimed primarily at adapting the home to the (evolving) needs of the household, in which they may be asked to include energy improvements. The construction sector is organised by trades and extremely fragmented, made up of a myriad of small and micro enterprises. This means that craftspeople, even those highly skilled to meet the needs expressed by their clients, are not necessarily in a position to offer complex and comprehensive refurbishments. And it is not reasonable to expect them to spend time they do not have, answering needs that were not expressed, proposing solutions that only their peers and competitors can deliver.

General contractors (and to some extent **craftspeople networks**, especially those affiliated to energy providers⁷) are in a

5. For each of the experiences mentioned, a link to the website is provided in the Reference section.

6. This analogy was first formulated by Françoise Réfabert, Énergies Demain.

7. It is worth highlighting the existence of craftspeople networks with strong focus on energy. Many, such as *BLEUCIELED* or *RéseauPro ENGIE* in France, were developed under the impetus of some energy providers, as a result of the energy savings obligation set in the Energy Efficiency Directive (EED).



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

better position to propose a broader set of interventions, part of which will be sub-contracted to smaller companies. However, they will most likely focus on the interventions they know best and/or which are the most profitable for them, and will not necessarily advise the homeowner to engage in complex energy renovations which they are not experienced in. While general contractors often provide valuable advice to homeowners, their advice cannot be neutral as their interest is to sell the standard works where they maximise their profits and limit their risks. In addition, general contractors do not necessarily have sufficient means for marketing and promoting new innovative solutions to homeowners and they are, in most cases, not capable of providing financing solutions⁸.

Brokers are often put forward when reviewing existing *one-stop-shops* models, especially as initiatives led by private actors⁹. Brokers act as intermediaries between individuals and professionals, not only from the construction sector but also, possibly, from the financial sector. On the one hand, brokers help homeowners define their project and, on the other hand, they help professionals find clients. Assuming that homeowners' willingness to pay for such services is low, the underlying business model is usually based on a commission charged to professionals, typically 5–10 % of the amount charged to homeowners. This means that, ultimately, brokers' main clients are

not the homeowners but the professionals, for whom they act as business introducers. While this market positioning is perfectly relevant, it is not always well explained and understood, sometimes leading homeowners to distrust the advice given. All the more so considering the aggressive telemarketing practices of some brokers, which are damaging the reputation of all players in this market segment, including the most virtuous.

Retail banks are specialised in providing financing solutions and their role is crucial to allow deeper renovations, which usually require external finance. Their existing customer relation can be activated to provide first level advice, such as information on energy savings opportunities and existing subsidies, and even sometimes simplified energy diagnosis. However, while retail banks can improve their products to better meet the needs of their clients, they can provide credit only if there is a solvent demand for credit.

Equipment providers (i.e. hardware stores and equipment vendors) are quite active nowadays in promoting energy efficiency measures, which is a good way to boost their sales. Although their market positioning differs, they usually have a significant marketing capacity and can be excellent information relays. They are traditionally core actors in the vocational training of craftspeople and construction companies. In addition, these actors are in a position to reach the *informal* energy renovation market, i.e. the probably significant number of individuals who perform energy renovations without any professional support.

In the specific segment of multifamily buildings, **condominium administrators** are increasingly dealing with energy efficiency, particularly where the legislation requires energy audits, and sometimes even energy improvements. However, they operate in a particularly challenging market segment where the decision-maker (i.e. the homeowners General Assembly) is usu-

8. Also resulting largely from the energy savings obligation set in the EED, we note the existence of banks created in joint venture between energy providers and high street banks. Rather than offering energy efficiency financing directly to homeowners, these specialised banks pass through the intermediary of craftspeople (members of the networks mentioned earlier), whose technical offer they support by providing financing solutions.

9. See, for instance, the *Reimarkt* (NL) concept in the Netherlands. However, it seems that the experiment is being phased out, following a decision by the municipality of Groningen to end its subsidies.

ally weak, fleeting (the General Assembly meets usually once, exceptionally twice per year), divided (mosaic of individuals with divergent interests) and distrustful of any external actor. Their low remuneration compared to the complexity of an energy renovation project, and the risk of losing their management mandate if they are too insistent, mean that they are probably not the best prescribers, although they can play a central role.

Finally, **public authorities**, especially local and regional authorities and their **energy agencies**, can provide valuable information and first level advice to homeowners thanks to their proximity. However, they are usually reluctant to intervene in a competitive market and prefer to position themselves in a neutral role of information and orientation. This means, for example, that they do not go beyond a certain level of detail in their recommendations, or they cannot recommend a specific private actor. Furthermore, many of these structures do not have the human and financial resources to proactively approach homeowners and, as consequence, are mostly in contact with homeowners who are already motivated or engaged in a renovation process.

In a nutshell, it is not the lack of participants in the market that explains the low uptake of energy renovation, but rather their absence of coordination and their diverging interests which prevent a holistic answer to the needs of the homeowner. Public intervention is needed to create and strengthen the missing links between fragmented market offers, and to accelerate the transformation of practices towards low energy renovation.

WHAT ARE “INTEGRATED HOME RENOVATION SERVICES”?

While it is fairly simple to describe what “Integrated Home Renovation Services” (IHRS) might include, their concrete implementation can take many different forms depending on the local context and resources. Here is how to understand the terms:

- **Integrated** has a twofold meaning. The approach should combine various services in a packaged offer to homeowners, in order to create confidence and simplify the renovation process. The approach should also be well integrated in its context, making best use of what is locally available, notably in terms of public support schemes and local market players.
- **Home** means private homes, which can be individual or multifamily buildings, but not public buildings, social housing or tertiary buildings.
- **Renovation** focuses on existing buildings and excludes new buildings. In particular, the focus should be on low energy renovation, either all at once or at least in a planned staged approach that could be followed-up by the IHRS, using tools such as Building Renovation Passports.
- **Services** emphasizes the nature of solutions to be provided.

Note that this approach is often discussed under the denomination of *one-stop-shop*. However, the use of this term in the public debate is not yet stabilised and it is commonly used to refer to a wide range of very different approaches, not limited to housing, many of which focus on streamlining public funding (i.e. single funding portal). We therefore prefer to use the more specific term of IHRS.

Promising local experiments along the customer journey

Several public authorities have developed local IHRS, often with the support of EU programmes. Although many of these initiatives are still in early stages of implementation, there is already a lot to learn from their intervention logic, pending further analysis in the future. Rather than presenting all these initiatives in detail, we use them as examples for the different steps of the customer journey identified in Figure 1. This does not exclude that other initiatives may be as relevant.

INFORMATION/MARKETING

At this first stage of the customer journey, the aim is to raise homeowners’ awareness on how they consume energy, the importance of controlling their consumption and the means to do so. Through the use of various communication media, this stage reaches out to the largest audience and aims not only to trigger immediate actions but also, in the longer term, to change homeowners’ representations and disseminate new social norms. Messages are not specifically tailored to the particular situation of the homeowner, and can be issued by a wide variety of public or private actors. This role has been taken historically by public authorities, and is typically delivered by local energy agencies. **The impact of information/marketing can be greatly enhanced in an IHRS by linking it with a concrete offer of services.** This can explain the relative success of some private IHRS led by equipment providers, such as the *Better Home (DK)* programme¹⁰.

DETECTION

Homeowners are rarely ready to make major decisions and the window of opportunity for an ambitious renovation is quite small. It is therefore important to detect and target more precisely those households who are more likely to undertake a renovation. In particular, low energy renovations are much easier to integrate in a global renovation of newly purchased home, where homeowners often implement a number of interventions before they move in (e.g. repaint the façade, change windows or boiler, etc.). **House buyers are therefore a key target group**, which needs to be approached before the actual purchase, for example by channelling information through real estate agencies, banks and notaries. For example, the *C-Real (BE)* project in Limburg follows such approach by establishing a permanent, structural collaboration between a mortgage lender (Onesto) and a semi-public renovation adviser (Dubolimburg).

SIMPLIFIED DIAGNOSIS AND RECOMMENDATIONS

Beyond the provision of information (message-centred), a further step is to provide advice (recipient-centred) to homeowners, i.e. to guide them in their choices. Such advice is not necessarily limited to technical aspects and may also cover financial aspects (focused here on the investment profitability), including information on available subsidies and the way to mobilise them. Although generic, **such advice gives homeowners the key elements to make a first decision (go/no-go)** and engage

10. Although it now appears that its private promoters are putting a stop to it. It should also be noted that the existence of a vested interest in such IHRS could be perceived negatively by homeowners in a different cultural context.

further into the customer journey, possibly with support from the IHRS. At this stage, advice can take the form of a simplified diagnosis, based on standardised typologies and calculations, to estimate roughly the potential energy savings, the costs and available public grants.

Services at this step are mostly provided or funded by public entities, with the explicit intention not to disturb the private market, and **exclude going into design details**, selecting construction companies, supervising the proper execution of the work, or ensuring its reception. In no way does the adviser substitute the homeowner who remains sole responsible for all decisions taken. This is, for example, the positioning chosen by *Padova Fit (IT)*, which consists of an information desk operated by the municipality, providing first level information and advice and then referring homeowners to a list of qualified professionals whom they can contract directly. Subsequent operations are facilitated by the definition of standard protocols and contracts that professionals can use, which can significantly increase the impact of giving simplified recommendations.

Such positioning has the advantage of not engaging the IHRS professional responsibility in case of problems during the execution of works. However, **the choice of not taking part in the design and selection of construction companies reduces the attractiveness to homeowners**, for whom these are the most stressful steps.

PROJECT DESIGN

To overcome the limits of the previous positioning, an IHRS can decide to go one step further and **support homeowners more operationally in their energy renovation project**: firstly by carrying out a detailed on-site energy audit, to analyse the specific situation and determine potential savings; secondly, by defining in details the work to be performed, including specific requirements (e.g. on thermal bridges) and making sure these specifications comply with grant requirements (e.g. levels of thermal resistance, qualification of the builders...). Such detailed project design is rarely prepared for individual retrofitting measures (such as a boiler replacement) but it is usually needed for comprehensive low energy renovations.

This constitutes a first qualitative leap and a **tipping point between an “advice model” and a “support model”**. This means carrying out market activities and incurring professional liability for the advice provided. The switch from one model to the other can be materialised by the existence of a service contract or by a physical visit to carry out the audit.

SELECTION OF COMPANIES

In this step, the homeowner asks construction companies (or groupings thereof) to provide quotations and then selects the best offer. Note that in small renovation projects, construction companies may be identified earlier (including without competition) and involved in the design; however, in the perspective of a publicly organised IHRS this should be avoided because of the risk of conflicts of interests.

The selection of companies is a crucial step. It usually represents a lot of stress for homeowners due to the difficulty of mobilising companies, the technicality of the offers and the fact that actual investment costs are decided. Insufficient specification of the works often leads to unforeseen costs or litigations due to sub-optimal quality of the works.

Significant cost reductions can be achieved through IHRS at that step, especially for low energy renovation, by moving from a project approach to a programme approach, i.e. through standardisation and replication. Quotations can be improved by: reducing the transaction costs for preparing an individual quotation (which is never exactly the same); reducing the risk of unforeseen costs, which is very real, especially when companies do their first project; reducing the risk entailed by co-operation with other construction companies, which is often required in order to better coordinate delivery and quality of the work; reducing costs for equipment by negotiating larger or collective contracts. *Oktave (FR)* has thus trained over 200 craftspeople to form groupings capable of delivering low energy renovation projects based on standard renovation packages, which reduces design costs and the price of quotation.

We distinguish 3 possible IHRS organisations at this stage:

- **Assistance:** the IHRS works in the exclusive interest of the homeowner, which means that it must have no contractual relationship with the companies performing the refurbishment. Furthermore, while it advises on the choice of companies (e.g. by making available a directory of (possibly certified) companies), it does not select them on behalf of the homeowner, who remains fully responsible for this choice and its consequences. This is, for example, the traditional positioning of architects, and the one chosen by *Hauskunft (AT)* in Vienna. Beyond the scope of an *advice* model, in a *support* model, the IHRS can assist homeowners to launch a consultation of companies, obtain quotes and analyse them, often giving an opinion on what is or not a “good price” and even sometimes supporting homeowners in negotiating prices.
- **Delegation:** the IHRS works in the exclusive interest of the homeowner and receives part of the homeowner’s prerogatives through a delegation contract. Although the homeowner ultimately assumes all consequences, the IHRS may perform certain acts defined in its mandate (such as, for instance, signing contracts with construction companies), which are binding for the homeowners as if they had performed those acts themselves. This is, for example, the positioning of *Hauts-de-France Pass Renovation (FR)* (which also includes a stand-alone financing offer).
- **General Contractor:** the IHRS not only proposes to design but also to carry out the renovation work. In that case, the IHRS may perform part of the work itself and/or hire construction companies and impose their choice on the homeowner. The IHRS relationship with construction companies can take several forms (subcontractor or co-contractor, with joint or separate liability), potentially through framework contracts. This constitutes a second qualitative leap and a **tipping point between a “support model” and an “implementation model”**. Indeed, the IHRS is no longer working in the exclusive interest of the homeowner but also has an economic interest in delivering works. It should be noted that while this does not prejudice of its quality, the advice provided upstream by the IHRS may be perceived as less impartial. A positive aspect is that, since the IHRS has the possibility of making profit on the work, it may offer less expensive advice upfront. This is, for example, the positioning chosen by *FaciRénov (FR)*.

FINANCING PLAN

Whereas financing is not THE solution to home renovation, lack of clarity on how to afford home renovation is often a good reason for abandoning the project. The financing plan is one of the first questions homeowners ask at an early stage; it is progressively refined as technical choices and costs are clarified. The purpose of the financing plan is not to answer the question “*Is the investment attractive?*” but rather “*How can I pay for it?*” (whether profitable or not).

The IHRS needs to identify precisely the household’s self-financing capacity (its savings and incomes), the amount of public grants which can be accessed, the amount to borrow but also that of other outstanding loans, which condition the homeowner’s capacity to repay. The financing plan needs to be clarified well ahead of the start of the works, including the agreement on a potential loan.

It may seem obvious for an IHRS to add this type of service on top of a core technical offer. However, financial services are highly regulated, and advice provided in preparation for banking transactions may be qualified as banking intermediation, which is a regulated profession. Financial regulations may entail organisational constraints for IHRS, for example specific qualification requirements for staff.

FINANCING SOLUTIONS

Immediately connected to the financing plan, a crucial step in most renovation projects, especially when targeting low energy renovation, is access to external financing sources, which usually consist of consumer loans (potentially subsidised) and secured housing loans/mortgages (in the case of a renovation bundled with a home acquisition project), as well as public grants. An IHRS can provide different services, potentially in combination:

- **Support in accessing public grants.** Although it is often possible to combine different grants, understanding the different requirements can be complex, as funding schemes are usually not coordinated between the different funding bodies (local, regional, national and European levels, as well as energy utilities in many countries). In the earlier stages of the customer journey, an IHRS can optimise the amounts of grants and ensure that the project complies with the grant requirements; in this step, the IHRS can also assist homeowners in preparing their grant applications.
- **Pre-financing of public grants.** While public grants improve the profitability of the investment, they are usually received *ex-post*, sometimes long after the work has been paid for. This means that the homeowner must have the capacity to finance the full investment, including the pre-financing of the grant amounts. IHRS can improve this situation by providing pre-financing solutions which can take the form of a short term loan¹¹. In this approach, the risk of non-compliance with the grant requirements (and also the risk of default on the short-term loan) can be mitigated by the IHRS in earlier stages if it is involved in the design. A subrogation mandate may even allow the IHRS to recover

the grants on behalf of the homeowner, as repayment for its short-term loan.

- **Pre-qualification for a retail bank financing offer.** Although the bank will usually make its own analysis of the homeowner’s financial situation, the IHRS can facilitate due diligence, notably by providing the information in a standardised format, in agreement with the bank. An IHRS can develop partnerships with one or more specific bank(s), and argue that it can bring a critical mass of projects to the bank, which may justify the bank setting up a specific product tailored to energy renovation, and training its staff on it.
- **Autonomous financing solutions.** The IHRS can even include a standalone financial offer within the package of services. This constitutes a **third qualitative leap and a (substantial) “option” that may be added to each of the three models** (although it has only been observed with the *support* and *implementation* models). Integrating finance makes the IHRS more attractive to the homeowner, as the decision to launch the work no longer depends on a third-party’s approval (the bank). Also, having been anticipated since early project stages, the loan application is usually not rejected. Finally, where investment grants exist, they can be integrated in the financing offer in the form of capital rebate. On the other hand, most homeowners prefer to deal with financial institutions they know and trust, especially when it comes to a long-term loan commitment, and the IHRS financial offer needs to be very well promoted to create comparable trust. Also, proposing a standalone financial offer requires an appropriate legal framework, as banking activities are highly regulated. For example, IHRS in France have the possibility to provide finance only because third-party financing companies are legally defined and allowed to offer loans to homeowners, under very specific conditions¹².

While access to credit was seen until recently as a major barrier to home renovation, it is perhaps less crucial nowadays given, on the one hand, the current low-interest rate environment and the massive injection of public funds in renovation loans (in particular linked to the European Green Deal and the Resilience and Recovery Facility) and, on the other hand, the **increased recognition by the banking sector of the impact of energy efficiency on the probability of default of mortgages** (cf. Billio M. et alii, (2020)). The banks involved in the *Energy Efficient Mortgage Initiative* are thus looking into the extension of their customer relation to cover the upstream parts of the customer journey in complement to their traditional role.

Several initiatives, initially inspired by the US-based Property Assessed Clean Energy (PACE) model, are also **exploring how to disconnect the debt from the homeowner and attach it to the property itself**. This **home-based financing** approach can be implemented in different ways. For instance, it is currently experimented via a Property Registry (see the *EuroPACE (ES)* project), via the energy bill (see the *RenOnBill (ES, IT, LT)* project) and via local taxes (see the *FitHome (NL)* project and the US PACE programmes). The main advantage of home-based financ-

11. This does not require a derogation from the banking monopoly as long as those loans are interest-free.

12. See art. 124 of Law n°2014–366 of 24 march 2014, which defines “third-party financing companies” and art. 23 of Law n°2015–992 of 17 August 2015, which clarifies the conditions for these companies to make loan offers.

ing is that it overcomes the aversion of households to take financial commitments with a longer term than they expect to stay in the dwelling. For example older households, although often free of mortgage repayments, no longer have access to long term loans and/or may no longer want to invest in the long term; on the other hand, younger households may not consider appropriate to undertake major investments in a home they do not plan to keep in the long run. The second main advantage of home-based financing is that it opens up new possibilities for debt recovery, including the possible intervention of public authorities in the collection process, thus minimising the risk of non-payment.

RENOVATION WORK

At this stage, the work is carried out by one, or more likely several, construction companies, usually organised as separate and uncoordinated trades. The added value of the IHRS is to organise and rationalise their different interventions. Yet, the lack of qualified craftspeople to carry out low-energy renovations is often cited by frontrunners as one of the main obstacles to the implementation of their IHRS. Conversely, craftspeople often argue that the energy renovation market is not sufficient (or less attractive in tense markets) for them to invest in training their staff. They may even view the IHRS as a competitor rather than a partner and refuse to collaborate, for example by refusing to act as a subcontractor to the IHRS.

This raises the issue of vocational training in the construction sector, which goes far beyond the scope of IHRS. Major efforts have been dedicated over the past decade to train the workforce and support the move upmarket, for instance through the EU initiative *BuildUp Skills*, and these efforts need to be continued and even increased in the future. An IHRS programme such as *SuperHomes (IE)* devotes a great deal of effort to training and coaching professionals and to setting up standards and codes of practice.

WORKSITE SUPERVISION/RECEPTION OF THE WORK

Worksite coordination and supervision are essential to avoid faulty work by contractors, which can lead to serious problems for the building (e.g. moisture due to thermal bridges or lack of ventilation) and can also have financial consequences if grant requirements are not met. For complex renovation projects, planning and coordinating the work of different craftspeople is also a challenge for which most homeowners are not equipped. Although work supervision is a common task for architects, most homeowners do not hire one and supervise the works themselves, and this should clearly be considered in the package of services proposed by IHRS.

QUALITY ASSURANCE, GUARANTEES AND FOLLOW-UP

Given current market maturity, the risk of poor workmanship remains very high, especially when it comes to low-energy renovation. Homeowners' satisfaction on the results is essential to establish confidence in the services provided by an IHRS, where word-of-mouth plays a major role. This raises the question of what an IHRS can guarantee to homeowners, which can take two main forms:

- The IHRS can provide a **guarantee on the quality of the work performed** (i.e. guarantee on the materials and methods used, also referred to as *intrinsic energy performance*

guarantee), with a clear commitment to correct defaults that lead to lower energy performance than planned. This is essential in case the IHRS *implements* the work, but also important when only *supporting* the homeowner.

- Some IHRS provide a **guarantee on the actual energy savings**, in the form of an energy performance (or similar) contract. This may be a key selling point for IHRS targeting multifamily buildings, in particular combined with finance as implemented by *Sunshine (LV)*. However, an energy savings guarantee appears less relevant for individual housing, or in multifamily building with individual heating systems, as it tends to entail disproportionate transaction costs and be intrusive for the household.

In the private residential sector, the notion of **quality should also cover the quality of services provided, from initial contact to after-sales services**. An IHRS must be able to guarantee the quality of the services it provides, including all the stakeholders involved. In *HolaDomus (ES)* for instance, contractors who wish to work with the programme are required to sign consumer protection policies as part of the validation package. These cover basic validation requirements (from solvency, reviews from other customers, licences etc.) to communication rules, some provision for code of conduct and a penalty point system too.

At this stage, the IHRS may also include **post-work monitoring, including advice and recommendations to homeowners on the proper use of the equipment** installed and how to achieve the expected savings on energy bills.

Main IHRS implementation models

We have highlighted in the previous section that there are number of choices which constitute qualitative leaps and tipping points between different models.

We identify empirically three main models for IHRS, although the boundaries between them may be porous:

- **Advice model:** the IHRS focuses mainly on the upstream parts of the customer journey, essentially information and first level advice, without getting into specific project details.
- **Support model:** the IHRS supports homeowners in the detailed design of their energy renovation project. The IHRS makes a first qualitative leap by being fully engaged in market activities, taking position and incurring professional liability for the support provided. In concrete terms, the switch from the *advice* to the *support* model can be materialised by the existence of a service contract, for instance, but not only.
- **Implementation model:** the IHRS makes a second qualitative leap by not only providing detailed advice but also carrying out all or part of the renovation work. As a result, and without prejudice to the quality of the advice provided, the IHRS no longer works exclusively in the interest of the homeowner but also has an economic interest in delivering works.

In addition to the services included in these three positioning models, a third qualitative leap can be made by offering **autonomous financing solutions**. Rather than a fourth model though, this is a (substantial) "option" that may be added on

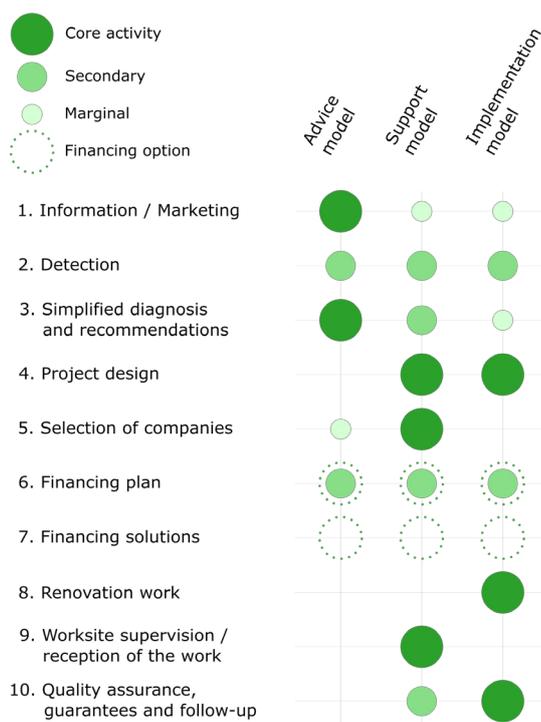


Figure 2. Main models of integrated home renovation services.

top of any of the three previous models (in particular the *support* and *implementation* models).

It is important to understand that, while the distinction between the different models is easy to define in generic terms, the exact tipping point is much less clear when one gets into the details, especially when it comes to distinguishing between *advice* and *support*. The boundaries between models are open to interpretation and in case of litigation, a court may judge that the IHRS is liable, even in the absence of a contract or even though the contract does not mention any liability.

How can integrated home renovation services be upscaled?

Upscaling home (low) energy renovation is a key objective, from the local to the European level, in order to achieve climate neutrality by 2050. Major and urgent efforts are required to disrupt current market dynamics, which justifies public intervention in organising IHRS.

STRATEGIC OPTIONS FOR INTEGRATED HOME RENOVATION SERVICES

The different IHRS models we have outlined are all valid and complementary rather than in opposition, as this remains an open field for innovation. However, public authorities wishing to set up an IHRS need to make a number of strategic choices, as **different models can hardly be carried out by one and the same structure**. The IHRS will either operate on the fringes of the market or fully on the market; the IHRS will either position itself alongside the demand, accompanying homeowners, or on the supply side, offering both advice *and* renovation work; the IHRS will either refer to a third-party financial offer (in most cases a retail bank) or propose its own autonomous offer.

Among the other strategic decisions public authorities need to make, we can highlight the following.

First, the **objectives and level of ambition of the programme** are decisive in choosing the most appropriate IHRS model. While simple measures, such as changing boilers or windows, can easily be achieved through an *advice* model, **the support and implementation models seem more adapted to delivering low energy renovation programmes.**

Also, the **costs to create and operate IHRS must be balanced against the investment potential**, which depends in particular on:

- The territorial scope and the potential number of homes to address. The most comprehensive approaches, especially those including financing solutions, will be better suited to a regional level, where sufficient demand can be met to balance costs.
- The expected average amount of investment per project, resulting from the level of ambition. The fixed and variable costs of implementing the more complex models must be justified by sufficient ambition and potential demand.
- The number and nature of the steps to be covered in the customer journey, the extent to which some of them can be monetised, and the positioning of the IHRS vis-à-vis the private sector.

Last but not least, **public authorities must decide how to best position their action to build homeowners' trust**, which is fundamental in the absence of a track-record of successful renovations that can be held up as examples to trigger new operations. All the initiatives we have taken as examples are based on public/private collaboration and the question is not so much who ultimately performs the services (usually a private contractor commissioned by the IHRS, except at the most strategic steps) but *who is accountable to homeowners for the intervention?*

The response to these questions will determine the most relevant intervention model and its specificities. There is no ideal configuration for IHRS, as **the best solution is a compromise based on local conditions.**

More questions of public action governance may arise which we cannot develop here. Should public authorities *push* private actors to expand their offer and collaborate, even if they do not have an obvious interest in it? Or, should an ambitious public offer be created, *pulling* the market by demonstrating how IHRS can work and getting private actors on-board? Should an *ad-hoc* structure be created to provide the services? Should such structure be fully private (as in *AnPost (IE)*), fully public and operating commercially (as in *Hauts-de-France Pass Renovation (FR)*), a public/private company (as in *Île-de-France Energies (FR)*), a public/private foundation (as in *HolaDomus (ES)* and *OpenGela (ES)*), or yet another legal form? Does this structure operate within the general legal framework of competition or as a Service of General Economic Interest (SGEI) or a Social Service of General Interest (SSGI), whose perimeter should be debated and legally defined, as is now the case in France¹³? In the case of a public service, will public actors operate among other market

13. See art. 12 of Law n°2013-312 of 15 April 2013 and art. 22 of Law n°2015-992 of 17 August 2015, which created a public service for the energy performance of housing.

players, or will they become organising authorities for the public service, which may (or may not) be delegated (in whole or in part) to private actors, but now under public supervision? This is just a first glimpse at the questions public authorities could debate and decide on, on their way to the creation of an IHRS.

SHOULD IHRS BE ECONOMICALLY VIABLE?

IHRS costs to provide services to homeowners, but also to ensure the back office (HR, IT, accounting, etc.), tend to be covered by public budget allocation in this still emerging phase, within a wider budget dedicated to structuring the market (e.g. training construction companies, coordinating with banks, etc.). Those costs can also be charged to private actors, at least partially: to homeowners who benefit from the services but also, alternatively, to the private companies who benefit from the IHRS intermediation.

Most IHRS used as example here were set up with the aim of ultimately running on a commercial basis and reaching economic equilibrium, after a pilot phase where public funding (notably from the EU's Horizon 2020 and ELENA programmes) covers a large share of the costs. We estimate that **it takes 4 to 6 years for an IHRS to reach maturity**, i.e. streamline its processes and interactions with stakeholders to deliver renovations with optimal cost effectiveness. However, **to date, none of the publicly supported IHRS initiatives we have mentioned have reached the stage of self-sustainability**, even after a number of years of operation and the delivery of substantial investments.

As a matter of fact, homeowners' willingness to pay for the services is a limiting factor. For example, the rather successful *Hauts-de-France Pass Renovation (FR)* only charges roughly half of its actual costs to homeowners, through a fee of EUR 1,860. However, if we look at the investments triggered in home renovation, between EUR 40–60,000 per low energy renovation project in the case of Hauts-de-France, IHRS present **a very significant leverage factor which in our view justifies to be publicly subsidised**, including the activities which pertain to the commercial sector. Most successful financial instruments to date subsidise energy audits and design costs, and the EU has demonstrated in the past 10 years the effectiveness of funding project development costs¹⁴; public funding should be extended to the services covering the whole customer journey. At a moment when the EU and the Member States are preparing to inject massive amounts of public grants in home renovation programmes¹⁵, it seems relevant to allocate part of these monies to IHRS, which we consider as **indispensable to ensure public grants are absorbed and properly allocated to low energy renovations**. In the future, public funding could then be progressively reduced, once the value of such services is sufficiently recognised by homeowners.

COMPLIANCE WITH COMPETITION AND STATE AID RULES

Integrated Home Renovation Services include many services that would normally be delivered by private market actors, which may raise concerns about possible distortions of compe-

tion. The fact that an IHRS does not charge homeowners for its full costs, or that it benefits from guarantees from its public shareholders, may for instance raise State aid concerns. Public authorities subsidising the operation of IHRS will likely be required at some point to guarantee an open competition to all market actors when awarding such public grants. This may be counter-productive, especially for the *support* and *implementation* models: although the 4 to 6 years required to go up the learning curve are in line with the time frame of public contracts, the obligation to re-procure periodically may be a serious disincentive for the IHRS provider to invest in optimising the services.

Compliance with competition and State aid rules is a complex political issue. It could become a major obstacle to the large scale deployment of IHRS and, considering their importance to allow large-scale investments in home energy renovation, a public debate would be needed.

Conclusion

The European Union's target of halving greenhouse gas emissions by 2030 and reaching climate neutrality by 2050 requires large-scale low energy renovation of existing homes to begin as soon as possible. One of the main challenges is the absence of a coordinated and coherent response to the needs of homeowners at each step of their customer journey, which discourages many and limits the energy savings achieved by others. **Integrated Home Renovation Services reduce the burden of energy renovation on homeowners and are essential for home renovation programmes to deliver at the scale required**, and in particular to ensure that renovations reach the low energy renovation standards.

At the local level, Integrated Home Renovation Services have been piloted across Europe over the past decade, often with support from the EU's Horizon 2020 and ELENA programmes. These pilot initiatives are developing new insights, of which we have only scratched the surface here, and their findings must be further harvested, analysed and debated. The three models identified (*advice*, *support* and *implementation*) are mainly heuristic and, building on frontrunners' best practices, the concept has to be adapted in concreto to the local context, policy framework and regulations.

On a more systemic level, public funds need to be allocated to technical assistance schemes at national and local levels, to support the multiplication of initiatives. Special attention should be paid to adapting the legal and regulatory frameworks in order to facilitate the deployment of such integrated services. Last but not least, major efforts need to be dedicated to build the capacity of local actors (public authorities, energy agencies, etc.) and develop the new skills, and even the new professions, needed for the definition, implementation and large scale operation of Integrated Home Renovation Services in Europe.

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15. Notably from the Resilience and Recovery Facility and from the European Structural and Investment Funds, which are mostly managed at Member State level; funds could for instance be allocated to technical assistance schemes at national and local levels, to support the multiplication of initiatives.

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Acknowledgements

The authors would like to warmly thank for their constructive feedbacks: Andreas Rüdinger, Eduard Puig MacLean, Françoise Réfabert, Kristina Klimovich, Nicholas Stancioff, Robert Pernetta and Stephan Hartmann, as well as all participants in the different initiatives developing Integrated Home Renovation Services mentioned in this article, and those which could not be mentioned.