

STRATEGIC ASSESSMENT OF A ONE-STOP-SHOP INITIATIVE IN THE 4 PILOT AREAS

Task 2.2



D.2.2. STRATEGIC ASSESSMENT

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ACRONYMS

CPD	Comune di Padova
EE	Energy Efficiency
EPBD	Energy Performance of Buildings Directive
EPC	Energy Performance Certificate
ESCO	Energy Service Company
EU	European Union
FFS	Forum per la Finanza Sostenibile
GWh	Gigawatt-hour
HOA	Homeowners Associations (Bulgaria)
JRC	Joint Research Centre
M	Million
M€	Million euro
MWh	Megawatt-hour
NZEB	Nearly Zero Energy Building
OSS	One Stop Shop
PV	PhotoVoltaic
RES	Renewable Energy Sources
SEAP	Sustainable Energy Action Plan
SECAP	Sustainable Energy and Climate Action Plan
TEP	Tonnes of Equivalent Oil
UB	Università Commerciale Luigi Bocconi



1. INTRODUCTION

Cities can play a key role in facing climate change through energy consumption reduction in the building sector. In Europe, the buildings and construction sector accounted for 36% of final energy use and 39% of energy and process-related CO₂ emissions in 2018 (IEA, 2019). Increase buildings energy performance is fundamental to foster energy transition and, at the same time, improve the comfort of households.

Due to the large share of buildings with low energy performance, governments, technicians and scientists are aware of the crucial role played by retrofitting existing buildings (Pardo-Bosch et al, 2019). The building retrofitting process brings to several benefits, such as the access to new energy sources, the decrease of energy demand, the improvement of air quality and indoor comfort, the minimization of global warming, the reduction in operational and maintenance costs, and the increase of social well-being (Pacheco-Torgal, 2017; IEA, 2019; Pardo-Bosch et al, 2019).

The widespread diffusion of energy efficiency policy and measures has been introduced to stimulate and support the diffusion of home energy renovation projects. Yet despite the development of such policies, many barriers remain in improving homes energy performance. Barriers are related to economic, social, technical and institutional issues (Wilson et al, 2015; Kerr & Winskel, 2018) which limit the diffusion of home renovation interventions and reduce the achievement of European target goals.

PadovaFIT EXPANDED aims to overcome barriers in home energy renovation practices, by creating and piloting a One-Stop-Shop (OSS) dedicated to supporting citizens in the energy renovation of private residential buildings. An OSS is widely considered as a business model and a physical office where multiple services are provided to offer customers all they need for the home retrofitting in just "one-stop". Different type of OSS business models already exists in Europe and beyond. Starting from the lesson learnt from existing OSS initiatives, PadovaFIT EXPANDED aims to set up and develop an OSS in the Padova area (IT), taking also benefits from the knowledge and expertise risen during the previous PadovaFIT project. A second pilot case will be developed in Timisoara (RO), taking benefit from the work done in Italy and adapting it to the Romanian conditions. Finally, an action plan will be prepared by the Bulgarian Energy Agency of Plovdiv for the launching of sound one-stop-shop in two Bulgarian cities.

PadovaFIT EXPANDED brings together a strong consortium of 8 partners coming from four EU member states. The Municipality of Padova coordinates the consortium supported by Università Commerciale Luigi

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Bocconi, SINLOC, SOGESCA, Forum per la Finanza Sostenibile and Climate Alliance, a European network of local authorities for sustainability.

1.1 Aim and objective

The results provided by Deliverable 2.1 on OSS business models categorization and the study on innovative technical and financial instruments existing in Europe and beyond (Deliverable 4.1 and 5.1) give an overview on how to boost home renovation by an OSS implementation. Task 2.2 aims to identify and assess all contextual factors which can influence the establishment, the operability and the success of an OSS per each area involved in the project.

The contextual situation is analysed by developing a strategic assessment. The strategic assessment is carried on by UB on the Padova area and the follower areas, Timisoara (RO), Vidin and Smolyan (BG). For the strategic assessment, useful data come from WP3 (Task 3.1 and 3.2), WP4 (Task 4.1 and 4.2) and WP5 (Task 5.1 and 5.2).

The strategic assessment aims to collect and analyse contextual information useful to understand the socio-economic, political and technical situation in the target areas, as well as home renovation market players and customers. The contextual condition can, directly and indirectly, influence the home renovation marketplace and the future OSS business model.

The strategic assessment is based on the analysis of three complementary macro-factors influencing the implementation and operability of the OSS. The macro-factors are categorized into three main groups:

- 1) Factors with an indirect influence on the marketplace,
- 2) Factors with a direct influence on the marketplace,
- 3) Internal factors.

The indirect influence on the marketplace is assessed by conducting a PEST analysis, taking into consideration the Political, Economic, Social and Technological factors that influence the marketplace and indirectly impact the future OSS business model.

The direct influence on the marketplace is analysed by assessing the influence of local regulation framework, public incentives and subsidies, technical and financial instruments, real estate market condition and finally market customers and players. The market players are analysed by conducting a player mapping among existing suppliers, competitors, potential new competitors, substitutes, and complementary businesses.

Finally, the analysis of OSS internal factors aims to identify possible key factors for the establishment of the business, such as the quality of human resources, the physical resources and technological capabilities, the financial stability, the revenue stream and fee types, the operational costs of the business, the external network.

The three analyses are necessary to conduct the overall SWOT analysis in the following task 2.3.

The strategic assessment with the analysis conducted by SINLOC on the financial tools operating in each target areas, and by SOGESCA on the building stock characteristics related to energy demand, gives a complete overview of all crucial factors affecting the future OSS business models in each target area.

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Deliverables 2.2, 3.3 and 4.3 contribute together to the definition of the current framework in which the OSSs are going to operate, looking at the picture from different angles. This kind of preparatory analysis is fundamental for the implementation of the OSSs.

2. METHODOLOGY AND APPROACH

The strategic assessment is an important tool to identify influencing factors and drive the decision on the OSS business model. First, all the factors involved in the home renovation marketplace have been categorized, understanding which one has an indirect influence, and which has a direct influence on the marketplace. Thus, factors are assessed by their capacity to affect the home renovation process, the homeowners' motivation of starting a home renovation project and the capacity to afford it. The factors analysed concern: political, economic, social and technologic elements, contextual regulatory framework, public incentives and subsidies, technical and financial instruments, real estate market, potential customers, and existing players.

The second step aims to identify internal factors, which can affect the operations of the OSS, both positively and negatively. The main internal factors analysed are the organization structure, the financial stability, the quality of human resources, the external network, the physical resources and the technological capabilities. Internal factors can directly affect the OSS organization and its capacity to deliver services and give an answer to customers' needs. The internal factors analysis was conducted through an online meeting, organised in accord with the project partners. The meeting involved 5 international OSS initiatives and consulting firms operating in the home renovation, which already provide services for home renovation.

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Figure 1 shows the three complementary analyses which compose the strategic assessment.

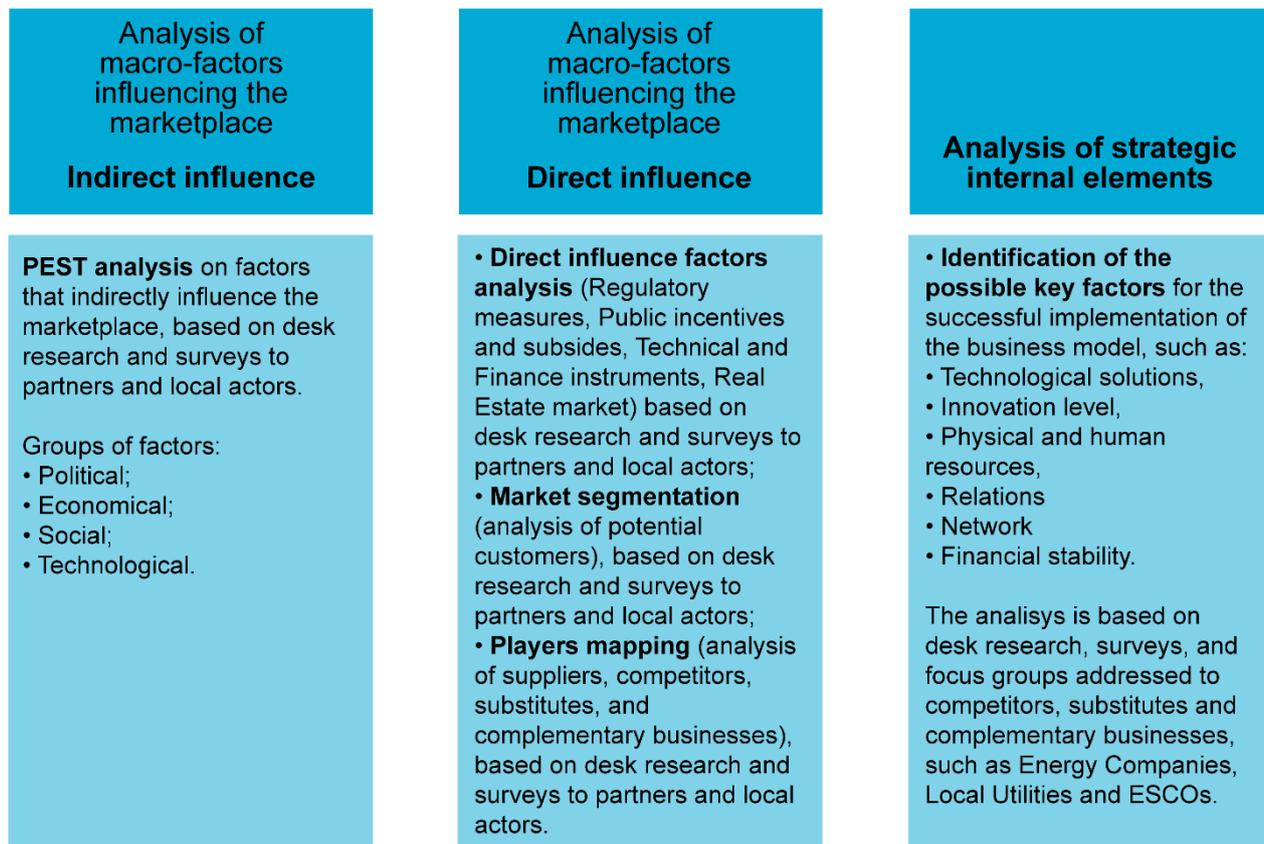


Figure 1 Strategic Assessment methodological approach

The first group (Figure 1) contains factors that indirectly influence the home renovation marketplace. The assessment is conducted using the PEST analysis. Through the PEST analysis is possible to identify and evaluate the most affecting factors which may influence the OSS business model under a political, economic, social, and technological point of view. The analysis examines the impact of each of these factors (and their interplay with each other) on the business. The results can then be used to take advantage of opportunities and to make contingency plans for threats when preparing business and strategic plans.

The second group (Figure 1) contains factors with a direct impact on the home renovation marketplace. Those are organized in three main categories: 1) Direct influence factors (regulatory measures, public incentives and subsidies, technical and financial instruments, real estate market); 2) Market segmentation (the analysis of potential customers); and 3) Market players (the analysis of suppliers, competitors, substitutes and complementary business).

The third group (Figure 1) contains internal factors that directly impact the OSS business model. Those represent key factors for the successful implementation of the OSS, and they refer to variables such as the organization structure, the financial stability, the quality of human resources, the labour skills, the physical resources and the technological capabilities. Conducting an internal analysis often incorporates factors that provide useful information about the organization's strengths, weakness, opportunities and threats. The data

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generated by the internal analysis will be important for developing the SWOT analysis and the future business model.

The three complementary analyses on indirect, direct and internal factors (Figure 2) provide all information need for the strategic assessment and the following SWOT analysis.

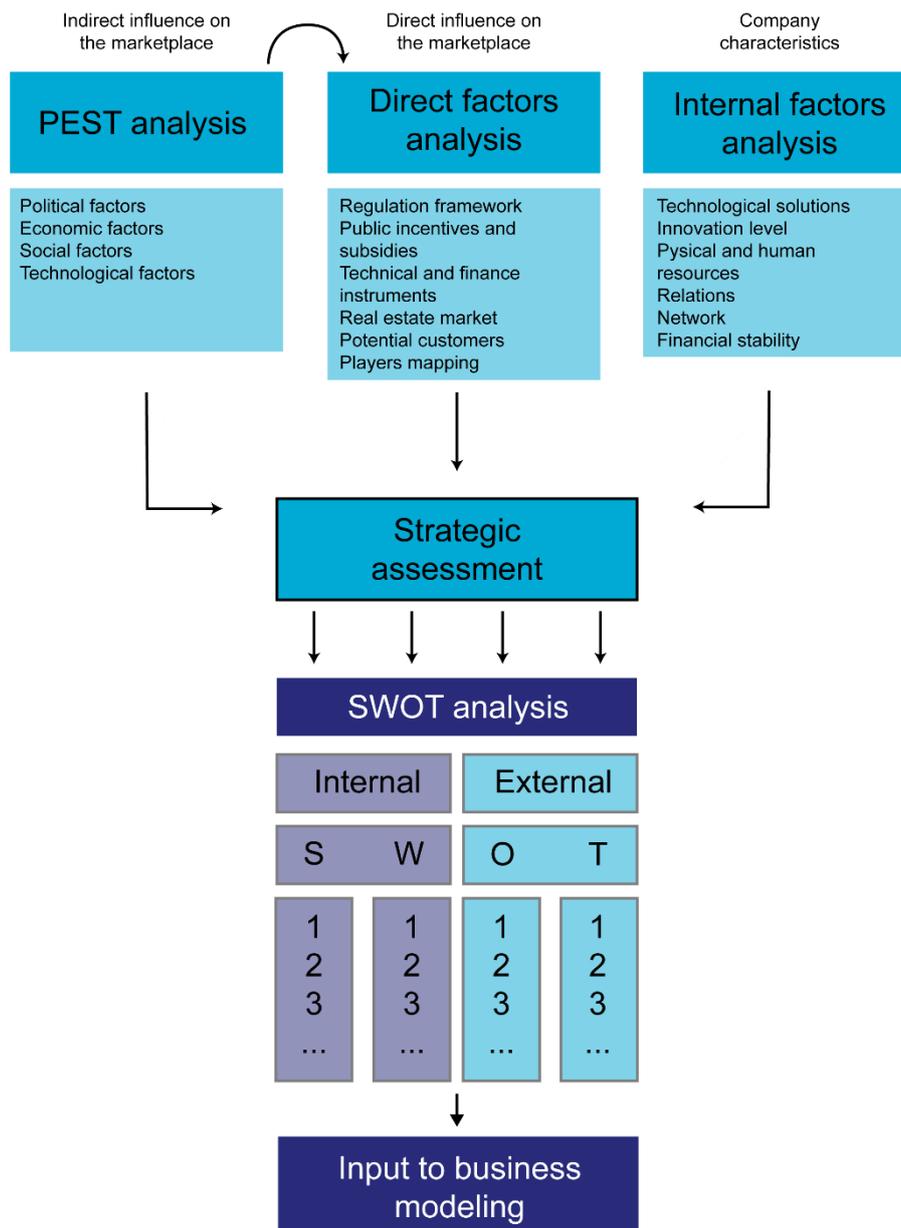


Figure 2 From the strategic assessment to the SWOT analysis

Step 1: Desk research

Per each target area, a study on the literature available was conducted. Literature concerns information about the status and achievements of energy policies and strategic plans, both at the national and local scale, the building stock conditions in terms of energy consumption, the households' socio-economic situations, the social awareness and interest in home retrofitting projects. Documents analysed are in most of the cases European and National reports, which give an overview of Countries and Cities situation in terms of environmental and energy policies, building and construction sector status, open data availability, economic situation and trend, etc. Useful information for the strategic assessment comes from the analyses conducted by project partners. D.4.2 provides the state of conservation of the local building stock and the need for energy renovation, and D.5.2 collects economic and financial information about households, through the detection of relevant features on the economic status of people living in the pilot areas.

Table 1 shows the list of literature and reports¹ per each target area.

Table 1 Literature and reports list about project target areas

Level of interest	References
Reports on EU countries status	IEA, 2019; EBRD, 2019; Economidou et al, 2019; Blank, 2019; European Commission, 2019; Eurostat, 2018, 2019; European Commission and Directorate-General for Economic and Financial Affairs, 2019; BPIE, 2011; Artola et al, 2016.
Padova (IT)	PNIEC, 2019; ENEA, 2019; Padova SEAP, 2011; Padova SECAP, 2020; Regione Veneto, 2020; Cresme 2020; FIAIP, ENEA, I-Com, 2018; PadovaFIT project (2013-17).
Timisoara (RO)	Bose et al., 2015, Timisoara SEAP, 2010; Government of Romania, 2015; NIPECC, 2018; Rugina and Lazar, 2012.
Smolyan (BG) Vidin (BG)	World Bank, 2017; Volt et al, 2018; Georgiev, 2015; Vassilev and Spassova, 2015; European Commission, 2017.

Step 2: Development of questionnaires

When information was not publicly available a questionnaire was delivered to public authorities: the Municipality of Padova for Padova area, the Municipality of Timisoara for Timisoara area, and the Energy Agency of Plovdiv for Bulgarian cities. The questions aim to better understand the contextual situation in terms of local climate and energy commitments, the presence of public instruments to drive the home retrofitting (such as incentives, subsidies, fiscal rebates), the availability of energy-related databases.

¹ For more details about literature and reports see the References section.

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The questionnaire results represented a good starting point for defining which information still lack for the strategic assessment.

The approach selected for collecting the lacking information is the semi-structured survey. An online questionnaire has been developed and submitted to local actors, with expertise in the home renovation process. The semi-structured survey is particularly useful for collecting information on complex situations, it is often used during the assessment processes (Adams, 2015). The semi-structured survey employs a blend of closed- and open-ended questions. Generally, the semi-structured interview/survey is conducted one to one. However, the complexity of the topic needed the involvement of many actors, impossible to involve by one to one interview. The COVID-19 emergency also hindered the direct involvement of actors.

The questionnaire aims to verify and understand the contextual conditions for the OSS implementation and future success, analysing the factors with an indirect and direct influence. The results will show, per each target city, the feasibility of an OSS, its potentialities, the incurring of contextual barriers or limitations, and the existing players and customers. Understanding the ongoing situation and future trends are crucial for designing a proper business model according to specific territorial needs and barriers. The questionnaire also aims to show the most attractive solutions for the OSS implementation in terms of services to deliver, according to expert opinion and experience.

This approach has been selected for two main reasons: 1) the facility to collect information from different local experts, and 2) the possibility to easily compare the results between target areas.

The questionnaire aims:

- To identify and evaluate the main factors with a direct and indirect impact on the home renovation marketplace in each target area,
- To identify market segmentations,
- To identify market players,
- To assess the differences between target areas,
- To collect experts' opinion on the OSS potential services.

The questionnaire is composed of 3 blocks:

1. questions on factors with an indirect influence on the marketplace: political, social, economic and technological factors,
2. questions on factors with a direct influence on the marketplace: home renovation regulatory measures, home renovation public incentives, home renovation technical instruments, home renovation finance instruments, real estate market,
3. questions on market players and potential customers.

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Step 3: Development of workshops

Another type of approach was designed for the OSS internal factors analysis. The internal factors analysis aims to identify the most successful solutions experimented by OSS initiatives and integrated energy consulting firms in Europe. The information refers to internal capabilities and capacities, type of services delivered, resources set up (skills, human resources, physical location and equipment, capital, customer base), existing synergies with other companies, revenue stream types, fee forms, and operational costs for the business.

This analysis has been conducted through an online capacity building session, organised in according with project partners.

The meeting involved three international OSS and consulting firms and two Regional Agencies (Table 2). The aim was to collect information on the OSS functioning, internal organization, and services delivered.

Table 2 List of OSS initiatives involved

Name	Type of organization/company	Services	Customers/ Beneficiaries
Hauts-de-France Pass Rénovation (France)	Public Regional operator established in 2013 with regional funds	<ul style="list-style-type: none"> • Information/consultancy services (i.e., energy audit) • Support in contractor's selection • Calls for tenders in case of multifamily housing • Home renovation projects management • Technical support • Finance planning (green mortgage, loans, third-party financing forms) • Monitoring (after and before works – 5 years after the end of works) 	Private homeowners (single and multi-family) Homeowners associations Building managers
Energy Agency of Modena (Lemon project) (Italy)	Non-profit association established in 1999 as a territorial energy agency 90 public bodies are members of the association	<ul style="list-style-type: none"> • Mobilizing energy efficiency investment coming from EU, National and Regional funds • Development of feasibility studies for energy investments • Development of economic and financial plans • Information/consultancy services • Local actor's involvement activities • Awareness-raising activities 	Public sectors (Social housing, public buildings) Local authorities

<p>Hola Domus - EuroPACE project (GNE Finance plus Olot Municipality) (Spain)</p>	<p>Public-Private partnership set-up by a public agreement, supported by European and Regional funds</p>	<ul style="list-style-type: none"> • Communities empowerment activities and market assessment • Home renovation support and management in collaboration with local authorities and players • Tailor-made home renovation forms (Technical assistance, Financial assistance, Smart funding) • Implementation of specific public funds (i.e. Social Guarantee Fund) • Contractors' selection and review of the technical solutions 	<p>Private homeowners (single and multi-family)</p> <p>Local communities</p>
<p>Tipperary Energy Agency (Superhomes) (Ireland)</p>	<p>Tipperary Energy Agency is a social enterprise which developed the Superhomes concept in 2015, funded by the Sustainable Energy Authority of Ireland (4 Regional Superhomes OSS have been activated)</p> <p>The team consists of a Project Manager, Project Coordinator, Technical Advisor, 8 Engineers, Marketing and Customer Service Support</p>	<ul style="list-style-type: none"> • Community engagement and awareness-raising activities (training, campaigns) • Technical services for home renovation (energy audit, analysis and systems design, EPCs) • Project management (engaging contractors, contracts design, project supervision, monitoring) • Finance support and advisory (feasibility studies, grants application and claim processing, finance structuring) • Local authorities support (Energy Master Plans) • Open source energy performance data platform 	<p>Private homeowners (single and multi-family)</p> <p>Local authorities</p> <p>Local communities</p>
<p>Energy Agency of Riga (Lithuania)</p>	<p>The OSS was established as a unit of the municipal agency.</p> <p>The OSS is fully supported and funded by the City Council as a non-profit entity</p> <p>3 staff members: 2 customer support experts (consultants) with specialisation in construction/renovation sector and 1 technical supervisor</p>	<ul style="list-style-type: none"> • Financial support: 50% co-financing for home renovation work, and 80% for an energy audit • Community engagement and awareness-raising activities (seminars, campaigns) • Technical advisory. But it is not engaged in the contractors' selection process; owners decide on their own companies) 	<p>Private homeowners (single and multi-family)</p>

2.1 Local Actors selection and questionnaire dissemination

In order to gather data from a wide set of experts covering different points of view and interests, the local partners identified per each target area a set of local experts covering 4 main fields of expertise: 1) political regulation (i.e., experts in the domain of energy efficiency and energy policy, and experts of energy and local planning); 2) socioeconomic framework; 3) marketplace customers and players (i.e., professional associations; consumer associations and NGOs); 4) technical and financial issues (i.e., energy utilities and other energy companies, financial institutions, and experts of energy retrofitting measures and financial tools).

Overall, 60 actors were identified by partners as potential recipients of the questionnaire in the 3 partner countries. The actors are differently distributed among the countries: 8 for the Padova area (Italy); 38 for the Timisoara area (Romania); and 14 for Bulgarian cities (Vidin and Smolyan).

The questionnaire was uploaded on the web-platform “Qualtrics”, which was chosen for its flexibility and functionalities. The questionnaire was available online from 6 March 2020 until 30 April 2020. Each partner was responsible for inviting recipients from his/her country to respond to the survey by sending an invitation email.

The questionnaire submission produced 40 responses:

- 6 from Padova (IT),
- 20 from Timisoara (RO),
- 14 for Vidin (BG) and Smolyan (BG).

The questionnaire results are anonymous, only aggregated data are shown in this report. This brought respondents to feel free in answering the questions and add personal opinions, according to their expertise.

2.2 Questionnaire overview

2.2.1. ANALYSIS OF MACRO-FACTORS WITH AN INDIRECT INFLUENCE

The first block of questions analyses factors with an indirect influence on the home renovation marketplace. The indirect nature of influence suggests that factors affect the macro-environment where the business takes place. This means that factors may affect the framework where the OSS will operate, and the services delivered. Indirect factors are assessed by using the PEST analysis. It is a tool used to monitor the macro-environmental factors that may have a profound impact on an organization’s performance. PEST is an acronym for Political, Economic, Social and Technological factors, which are four perspectives used to assess the market for a business or organization. It can be used to review a strategy or position, a company’s direction, a marketing proposition or a new idea.

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The block aims to answer two main questions:

1. What are the most important indirect factors influencing the market for home renovation and energy-efficient home renovation?
2. How do these factors impact the home renovation market?

The assessment has been conducted by structured rank questions, asking factor by factor, the degree of influence in each country: from 1 (low level) to 5 (high level). The questionnaire is reported in Annex 1.

2.2.1.1. Political factors

This part aims to assess what is happening politically in the environment in which the OSS will operate. The questions ask to evaluate the influence of a set of political factors affecting the establishment of a new business in the home renovation market. Some factors represent general elements, such as political stability, the level of competition regulation, and the bureaucracy, which affect all type of organizations and businesses. Others focus more on the home retrofitting market, such as the local commitment to energy efficiency, the coherence between energy local policies, regional policies and national policies, and the presence of local heritage preservation policies.

2.2.1.2. Economic factors

The economic success of a business involves the observation of key elements for the specific sector, which can affect the trend of customer investment. Generally, the average cost for home retrofitting is around 150 to 170 €/m² (Pardo-Bosch et al., 2019). This high up-front cost brings to the need for high investment efforts and easy and favourable access to credit. The main factors analysed include the rate of growth of the local economy; the capacity to access credit for private actors; the national interest rate for private loans; the local trend for private investments on home retrofitting (for home and tertiary buildings). These factors may have an indirect long-term impact on the OSS business model since they affect the consumers capacity to invest and their demand in terms of home retrofitting services.

2.2.1.3. Social factors

Social behaviours, cultural norms and expectations, environmental consciousness and lifestyle are crucial elements for increasing energy efficiency. For the home renovation market, the homeownership rate and the households' awareness of energy-saving benefits, as well as their propensities to renovate, are key elements, which may influence the OSS operability and success. The home retrofitting is a discretionary high-cost investment and homeowners need to be well informed and driven along the whole project. It is not only about to increase energy efficiency and indoor comfort, but it entails economic cost and temporal disruption. The homeownership affects the attitude to investing. Indeed, in owner-occupied homes where benefits, costs and disruption converge, there are more chances to start an energy-related home renovation project, than in rented houses (Ürge-Vorsatz et al, 2012). The questions aim to assess the level of influence of a list of key social factors such as: the citizens' awareness about the benefits of energy-saving/efficiency; the social approval linked to energy efficiency behaviours; the homeowner consideration of home retrofitting as a long-term investment; the social preference in owning a house instead of renting it.

2.2.1.4. Technological factors

Technological factors provide information about the innovation level reached by each target area, that may affect the operations of the OSS. The factors refer to the diffusion of technology systems applied in the home renovation and retrofitting projects. Technology systems are raising in importance for the home retrofitting, as the core for reducing the energy demand through higher efficiency heat systems (e.g., boiler replacement), and RES production in residential and tertiary buildings (e.g., PV systems and solar thermal systems, heat pumps, geothermal heat pumps or biomass systems), or combined systems for heat and electricity generation. The diffusion of other technologies has been also analysed, such as energy storage systems (e.g., home or grid-scale battery, thermal storage), district heating/cooling systems, and the share of electric vehicles. High level of technologies diffusion brings to several advantages: the decrease of costs, the increase of awareness, the increase of social acceptance, and the development of services linked (e.g., quality assurances, labels, maintenance services, etc.). The results may influence decisions to provide or not certain technical services or products.

- List of factors selected for the PEST analysis

Political Factors	Economic Factors
<ul style="list-style-type: none"> • Local political stability • National complexity of regulatory procedures (bureaucracy) • National competition regulation for companies • Local authority's commitment to energy efficiency • Coherence level between energy local policies, regional policies and national policies • Local heritage preservation policies 	<ul style="list-style-type: none"> • Rate of growth of the local economic • The capacity to access to credit for private actors • National interest rate (e.g. for loans) • Local trend for private investments on home retrofitting (for home and tertiary buildings)
Social Factors	Technological Factors
<ul style="list-style-type: none"> • Citizens awareness about the benefits of energy-saving/efficiency • Social approval linked to energy efficiency behaviours • Homeowner consideration of home retrofitting as a long-term • Investment • Social preference in owning a house instead of renting 	Diffusion of technologies <ul style="list-style-type: none"> • Condensing boilers • Solar electric, or photovoltaic (PV), systems • Solar thermal, including solar hot water and space heating • Heat pumps (air to air and water heat pumps) • Geothermal heat pumps • Cogeneration systems or combined heat, cooling and power (CHP) • Biomass systems • Energy storage systems (e.g. home or grid-scale batteries; thermal storage) • Electric vehicles • Vehicle to grid technology • District heating/cooling systems

2.2.2. ANALYSIS OF MACRO-FACTORS WITH A DIRECT INFLUENCE

Direct influence factors represent contextual variables which directly affect the home renovation marketplace and the OSS business model and success.

There are different types of direct influence factors. They can be grouped into seven main groups: 1) household characteristics (size, age, type, energy performance), 2) homeowners financial capacity (families economic status, household contract type, average annual expenditure in gas and electric energy, access to mortgages, etc.), 3) local policies (regulatory framework and public incentives and subsidies), 4) technical measures and finance instruments for home renovation, 5) real estate market situation, 6) market segmentation (potential costumers), and 7) market players.

The first group shows the real need in terms of home renovation interventions, the status of the building stock and the spread of energy consumption within the city. Indeed, the characteristics of the building environment (the type of buildings – single-family house or condominium – orientation, year of construction, destination, etc.), linked to urban shape and density directly affect the urban energy consumption. Thus, they can directly influence the services provided by OSS, in terms of standardization and service package design. This is a typical situation occurring in east European cities, with many buildings in the same quality status and with same structural and energetic performances.

The second one is also relevant in order to set-up services enable to take into consideration the economic status of people. The home renovation is a high-cost intervention, and the homeowner is the main investor. The family capability to invest and afford the home renovation depends on their economic status but also to the possibility to have access to financial tools, such as mortgage and loans.

The first two groups of direct influence factors have been analysed in D 5.1 and D 5.2. This work combines the main results achieved by them with the analysis on the other direct influence factors (Section 2.2.2.1).

For the other main categories of factors (local policies, technical measures and finance instruments, real estate market, potential customers and players) has been developed a set of structured rank questions, asking factor by factor, the degree of influence in each country: from 1 (low level) to 5 (high level). The questionnaire is reported in Annex 1.

2.2.2.1. Direct influence factors analysis

Local policies may affect directly the OSS implementation and operability under two points of view: 1) regulation (the establishment of norms, e.g. the Building codes, the Energy performance certificate – EPC, Labels), and 2) financial/capital support (for instance the possibility to gain incentives). The two levels of influence may increase the citizen and sector operator awareness, and the will for home renovation. Those affect the OSS capacity to reach customers, to engage players, and to make affordable and attractive the home renovation. Worldwide, there are many policies for encouraging and supporting energy-efficient renovation. The questions ask to rate the capacity of regulatory measures and public incentives to affect homeowners' behaviours (the decision to start a home renovation project) and boost home energy efficiency.

The analysis on technical and finance instruments aims to identify all instruments and tool which can influence the home renovation process, boosting the energy efficiency of buildings on one side and supporting homeowners' investment to the other. For the technical measures are considered interventions like windows

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replacement, walls and roofs insulation, facades renovation for multi-family houses, heat and cooling systems replacement, RES plants installation, etc. The analysis of those factors aims to discover the attractiveness for homeowners and the capacity to support the energy efficiency process. For the finance instruments are considered innovative financial models, like the Energy performance contract model, the On-bill financing model, the Green mortgage, the Loans supported by a guarantee mechanism. Those are amply discussed in the literature (Weiss et al, 2012; Wilson & Crane, 2015; Kerr & Winskel, 2018; Pardo-Bosch et al, 2019; Economidou et al, 2019). The analysis aims to grade the effectiveness of each one in terms of supporting homeowners and energy efficiency. The questions ask to rate the capacity of technical and financial instruments to affect homeowners' behaviours and boost home energy efficiency.

In general, the energy-efficient renovations in owner-occupied homes relate not only to the presence of financial, or technical tools but also to the capacity for homeowners to reach information. There are many information barriers, which include a perceived lack of credible and available information on efficiency measures, low misperceptions of energy costs, and uncertainties about contractor reliability and cost-saving outcomes (Weiss et al, 2012). For this reason, the questionnaire asks, per each type of factors, to rate the capacity for homeowners to access information and the need for the OSS to provide specific services in order to support the information accessibility on one side and the access to service to the other one. The results can increase the awareness about the information barriers affecting the home retrofitting in each target area and provide useful advice on which type services the OSS should deliver. The comparison of results may show differences between territories in terms of information availability and homeowners needs, which can affect the OSS implementation and business model.

The real estate contextual situation may have a direct impact on home renovation. The questions aim to evaluate the increase of home value, both for renting and selling, after a renovation project. The increasing of properties value may raise the motivation for homeowners to invest in retrofitting projects. It is a clear economic indicator, showing the economic benefits of such interventions, which can have a positive impact on the homeowners' consciousness and interest in retrofitting their home. It is also a crucial factor for the OSS future success and long-term operability.

- List of direct factors selected per each category

Category of direct impact factors	Factors
Regulatory framework	<ul style="list-style-type: none"> • <i>Building code</i> • <i>Mandatory (min) energy performance standard (new buildings, major renovation)</i> • <i>Mandatory (min) energy performance for heating systems</i> • <i>Energy Performance Certificate (EPC) mandatory (for selling/renting)</i> • <i>Certification/Labels for products services</i>
Public incentives	<ul style="list-style-type: none"> • <i>Public grants</i> • <i>Fiscal rebates</i> • <i>Volumetric incentives</i> • <i>Reduced interest rate public loans</i> • <i>Construction rights rebates</i>

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Technical instruments	<ul style="list-style-type: none"> • <i>Windows replacement and insulation</i> • <i>Walls insulation</i> • <i>Roof insulation</i> • <i>Heat and cooling system replacement</i> • <i>Integrated interventions</i> • <i>RES plants installation</i> • <i>Facade renovation (multi-family housing)</i> • <i>Energy audit</i> • <i>Home automation</i>
Finance instruments	<ul style="list-style-type: none"> • <i>Loans supported by a guarantee mechanism</i> • <i>Reduced interest rate loans</i> • <i>Green mortgage</i> • <i>On-bill financing model</i> • <i>Energy performance contract model</i>
Real estate market	<ul style="list-style-type: none"> • <i>EPC relevance in increasing the value of a property</i> • <i>EPC relevance in increasing the value for home renting</i> • <i>EPC in advertisement for selling and renting properties</i>

2.2.2.2. Market segmentation and marketplace players

In order to maximise the effectiveness of the OSS is important to single out the best and most promising market segments for energy-efficient renovation. There are many and differentiate potential customers interested in the OSS services, and those depend on the contextual situation. Final users represent the first and immediate market segments (i.e., homeowners, tenants, tenants/owners' unions, building managers, building facility managers). The other groups of potential customers are hard to identify. They can be companies operating within the home renovation chain (i.e., building developers, building designers, local utilities, technology providers, financial operators, associations or professional boards, etc.), which may receive advantages from the OSS, for instance, training courses, normative updating, quality certifications, etc. Identifying all segments with different characteristics and needs, that can be reached through different channels, greatly improves the chance for the OSS to enlarge its business and achieve higher impact. At this stage, the questionnaire only focuses on identifying the segments and their potential interest to the OSS services.

Energy efficiency market is not exactly one market but a conglomeration of various and very diverse businesses acting in the field and having different interests in energy efficiency. Several actors can play a role in fulfilling the customer's needs in the home renovation process: providers of energy-efficient equipment and services as well as institutions involved in financing and implementation of energy efficiency projects (banks, investment funds, design engineers, constructors, etc.), ESCOs, estate agents, ONGs. The competitive arena (suppliers, competitors, substitutes and complementary businesses), have a strong and direct impact on the development of new business within this market chain. Thus, it is important to map the relevant market actors, in order to analyse how these may influence the development of the OSS. The presence of such players in the target areas affects the OSS business model, under two points of view: 1) the possibility to involve them, with the aim to build a collaborative network along the home renovation chain (from the financing step to the installation of technologic appliances); 2) the raising of barriers and threats made by competitors and substitutes businesses to the establishment of the OSS. The questions aim to map the network of players in place in the target areas.

From the literature has been developed a list of actors who can be interested in the OSS services or can get advantages from the OSS. The questionnaire asks the respondents to indicate the role covered by each actor, identifying the OSS customers, partners, competitors, suppliers and finances and to rate the interest level in the OSS services.

3. RESULTS

The questionnaire was uploaded on the web-platform “Qualtrics”, which was chosen for its flexibility and functionalities. The questionnaire was disseminated to three countries: Italy, Romania and Bulgaria. The respondents are both project partners and local actors. The questionnaire submission produced 40 responses: 6 from Padova (IT), 20 from Timisoara (RO) and 14 for Vidin (BG) and Smolyan (BG).

The actors involved are representative of 4 key target groups: 1) experts in energy policy and regulation (36%); 2) experts in energy services (16%); 3) experts in technical retrofitting measures (30%); 4) experts in financial instruments (18%).

The questionnaire comprised 49 questions both closed and open. The closed questions were mainly aimed to obtain a rating of 1 to 5, where 1 represents a high level of influence and 5 a low one. The open questions were aimed to collect suggestions on additional notes.

3.1 Padova area

3.1.1 OVERVIEW OF THE TARGET AREA

For the Padova target area, the online questionnaire produced 6 responses: 2 local authority officers and 4 technical and financial consultants belong to 2 local firms and 1 no-profit organization. Although the survey sample is small, the results are in line with the study conducted on the literature. For this reason, the results can be considered relevant and representative.

- Building stock

Padova has over 210,000 inhabitants and a density of 2,263.64 inhabitants/km² (D.4.2). It is the most densely populated city in Veneto Region. The building environment amply varies within the city in terms of typology density, passing from having a landscape with mostly single and two-family houses to others where a majority of condominiums are present. Padova is characterized by a negative demographic trend with a tendency to the progressive ageing of the population. This phenomenon can negatively affect the home renovation

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marketplace because aged people usually tend to invest less in high-cost and long return home renovation projects.

There are around 31,000 residential buildings in the Padova area, 7% are single-story buildings, 52% have two floors, 23% three floors and, finally, 17% have four or more floors. The majority of the building stock is composed of semi-detached houses and small apartment buildings, although there are areas where condominiums are preponderant. Most of the buildings are dated between the 60s and 80s. Many condominiums have modest energy performances, falling into class G and having an average annual energy requirement of 180 kWh/m². Only 4% of the residential buildings were built after 2000, with higher energy performance. The maps produced by SOGESCA (PadovaFIT EXPANDED D.4.2) show a state of conservation of building between good and mediocre, but with high consumption of electricity and natural gas, especially related to condominium typologies. This type of residential building is harder to engage in energy renovation projects as a whole entity. In many cases, it is characterised by multi-family houses. A deep energy renovation for this case requires the engagement of many homeowners. It suggests the relevance of homeowners/tenants' unions and building managers as mediators and final user for the OSS services.

According to ISTAT (2019) in Italy, the percentage of people owning a house is 79,2%, whereas 20,8% lives in rented houses. 19,2% of families living in their own houses have a mortgage. The share of homeowners with a mortgage is higher in the North (22.3% in the Northeast). In Italy, families pay monthly an average of 66 € for home heating services, with a maximum of 82 euros in the Northeast. The second main cost for families is that for electricity (with an average of 49.83 euros per month).

The energy savings for the Municipality of Padova in the period 2014-2018 is about 9.100 MWh/year, considering the interventions benefiting from the tax deduction. The thermal consumption of the residential sector in 2017 (reported in the SECAP monitoring report, 2018) is about 950.000 MWh. That means that the home renovation rate is around 1% per year. This percentage is quite close to the EU one, which ranges between 0.5% and 2.5% a year, with a typical figure being 1% (about 250 million m²) per year (Artola et al, 2016).

However, according to data from a survey conducted by ENEA, I-Com (Institute for Competitiveness) and FIAIP (2018) with more than 600 real estate agents, the energy quality of the real estate stock in Italy is improving. This shows that the real estate sector is beginning to recognize the value of energy efficiency. Indeed, the purchase and sale of properties in the first three energy categories (A, B and C) grew by 6% and those of buildings undergoing renovation to improve their energy efficiency by 12%.

In Italy and Padova as well, due to the achievement of more awareness by the local authority through the previous PadovaFIT project, the home energy renovation market is increasing in relevance and significance. This increases the opportunities for the launch of new businesses in the sector.

- Legislative and regulatory framework

Italy developed an Integrated National Plan for Energy and Climate in force for the period 2021-2030 called Piano Nazionale Integrato per l'Energia e il Clima (PNIEC, 2019), and it forms part of the National Energy Strategy (2017). The plan is divided into 5 dimensions: 1) Climate action; 2) Energy efficiency; 3) Security, solidarity and trust; 4) Fully integrated internal energy market; and 5) Research, innovation and competitiveness.

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Nationally there are other two main documents concerning the environmental and energy policies, in line with the National Energy Strategy: the National Strategy for Sustainable Development (laid down in the “Collegato ambientale” Law 221/2015); and the 2050 Long-term Strategy for GHG reduction.

At the national level is important to quote also the so-called “Piano d’Azione Nazionale per incrementare gli edifici ad energia quasi zero” (2017)² which implements the European Energy Performance of Buildings Directive (EPBD, 2010). It aims to increase the number of new NZEB buildings and the transformation of existing buildings into NZEB, setting-up regulation and incentive measures.

At the local scale, Padova is going to approve in 2020 the Sustainable Energy and Climate Action Plan, promoted by the Covenant of Mayors. According to the Covenant agreement the Padova SECAP has six main goals: Promoting the Sustainable mobility; Stimulating a Green and low carbon economy; Boosting the refurbishment of private and public buildings; Increasing the Climate resilience of the territory; Creating a Smart city and more efficient networks; Promoting the energy production from renewables.

The Padova energy strategy is also implemented by the local Building Code, which integrates the national and regional regulatory frameworks. In Italy, the promotion of renewable energy sources and the achievements of energy standards by home renovation projects are regulated by two national laws: law 28/2011 (RES), and law 192/2005 (home energy renovation standard). The ministerial decree 26 June 2015, which is updated every 5 years, fixes specific parameters and standards to be accomplished by new buildings and major building renovation projects. The building code of the Municipality of Padova is going to be updated in 2020. In the new document will introduce specific incentives for the realization of private NZEB buildings.

Still lack a full integration between energy policies and other sectorial policies in the Padova area. Indeed, Padova, as well as the majority of Italian Municipalities, has an Urban Master Plan, which drives all the decisions and rights in terms of urban transformation and development. However, the Urban Master Plan does not directly integrate the local energy strategy and long-term goals. This lack of integration may bring to decrease the relevance of energy issue in decisions concerning the built environment.

The Italian law supports and fosters the energy renovation of houses by declaring mandatory the Energy Performance Certificate (EPC, called APE in Italy) for sell and rent a home. An EPC contains information about a property’s energy use and typical energy costs, and recommendations about how to reduce energy use and save money. An EPC gives a property an energy efficiency rating from A (most efficient) to G (least efficient) and is valid for 10 years.

- Economic and fiscal measures

In Italy, the building renovation is supported at the national level by several financing measures for all building typologies (Residential, Public buildings, Social Housing and Commercial buildings). The main financial and fiscal measures at different scales are listed in Table 2. At the National level, the fiscal rebates support homeowners for interventions like windows replacement and insulation, walls and roofs insulation, heat and cooling systems replacement, RES plants installation. With fiscal rebates, the homeowners can take advantage of the 65% deduction of the IRPEF Italian income tax thanks to the Ecobonus, when the renovation project brings to an energy demand reduction or the RES production. This tax break scheme applies not only

² <https://www.mise.gov.it/index.php/it/normativa/decreti-interministeriali/2036926-decreto-interministeriale-19-giugno-2017-piano-per-l-incremento-degli-edifici-a-energia-quasi-zero>

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to homes but also to companies, health facilities and sports centres. Similar fiscal rebates operate also for home renovation with no energy demand reduction. It is called Bonus ristrutturazioni, which allows the homeowners to deduct 50% of the costs of remodelling work. The fiscal rebates for home retrofitting interventions are spread for 10 years. For the national fiscal rebates, there is the option to obtain it as a front payment only in condominiums when the amount of the investment is higher than 200.000€ and more than half of the external envelope is refurbished. In this case, the fiscal rebate can be obtained by the condominium as a discount in the invoice. For private buildings and in other cases, the fiscal rebate can be transferred to the suppliers of goods and services that are realizing the interventions. This transfer can be used to cover part of the costs. At the Regional level, Public grants give support for the heating systems replacement and the installation of RES plants. At the Local level volumetric incentives and construction rights rebates influence new constructions which achieve the NZEB standards, and major renovation projects. Those are fixed by the local Building Code.

In May 2020 the Italian Government launched a new fiscal bonus within the ministerial decree called “Decreto Rilancio”. The new fiscal mechanism provides a 110% tax deduction of the refurbishment costs in 2020 and 2021. The payback time is also reduced (5 years instead of 10 years), and homeowners/condominiums can decide to transfer the fiscal bonus to third-parties, such as contractors, bank institutions, ESCOs. In order to access the new fiscal bonus is necessary to implement at least one of the following interventions:

- Thermal insulation: the interventions must concern more than 25% of the building envelope,
- Replacement of heating systems for condominiums. The new plants must be at least in class A.
- Replacement of heating systems with heat pumps for single-family homes.

Other energy efficiency interventions can also access the new fiscal rebate if they combined at least one of the three interventions previously described.

This new fiscal mechanism can open new possibilities for home renovation, especially in multi-family houses. New updates will follow up in the next months.

Table 3 Regulatory and public financial measures in Padova for residential and commercial buildings

Measures	Type	Beneficiaries	Level
Fiscal rebates for energy efficiency interventions (Eco-bonus, etc.)	Fiscal rebate	Taxpayers, homeowners	National
National fund “Conto Termico 2.0”	Public grant	Homeowners, public bodies, ESCo, companies	National
National fund on energy efficiency	Revolving fund	Public bodies, ESCo, companies	National
White certificates	Public grant	Citizens (via ESCo), ESCo, public bodies, energy distributors	National

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Programme for energy renovation of buildings owned by the central government (PREPAC)	Public grant/Subsidy	Public bodies	National
ERDF funds managed by Veneto Region: tenders for energy efficiency in homes	Public grant	Social housing, Regional agency	Regional
Construction rights rebates	Regulatory measure (reward)	New buildings (NZEB), contraction companies and building developers	Local

3.1.2. INDIRECT INFLUENCE FACTORS

- Political factors with an indirect influence on the home renovation marketplace

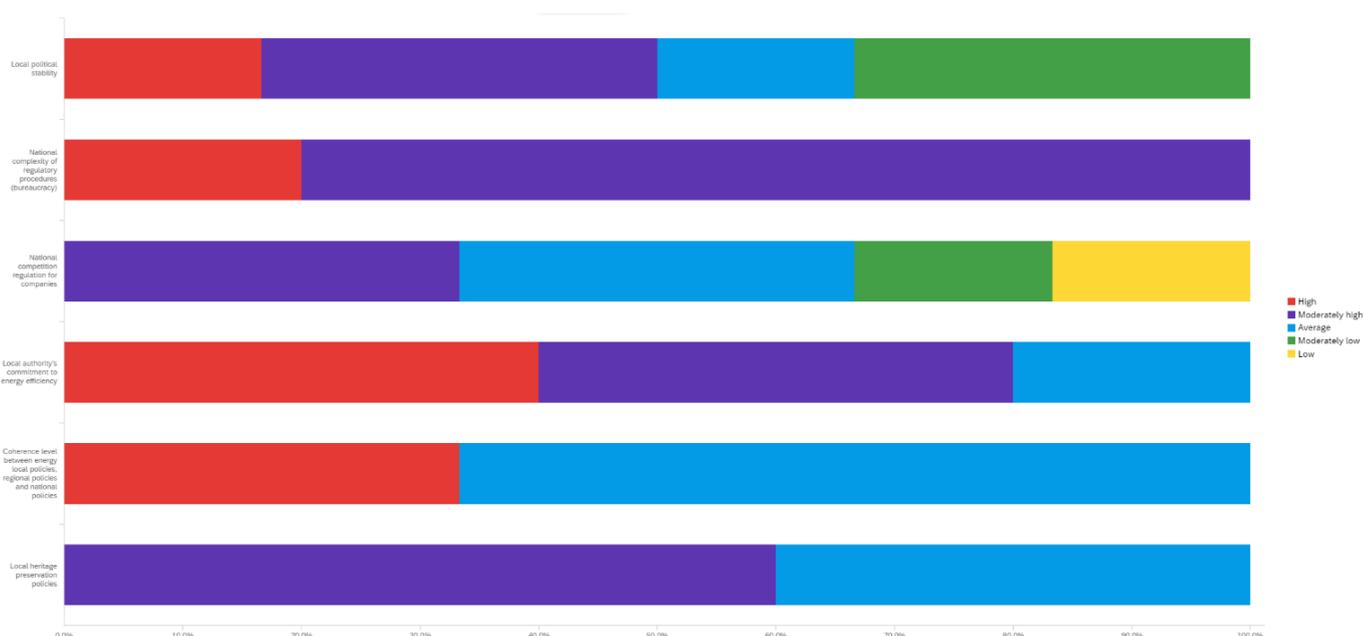


Figure 3 Share of Political factors relevance. In red high relevance, Moderate-high relevance in purple, Average in light blue, Moderate-low relevance in green and in yellow the low relevance.

The most influencing factor, according to the respondents, is the “Local authority’s commitment to energy efficiency” (40% of preference), followed by the “Coherence level between energy local policies, regional policies and national policies” (33%). The two factors are related and show the relevance of energy transition as a cross-sectoral issue. The “Local heritage preservation policies” also has a moderate-high influence (60%). Especially in cities with high historic value, heritage preservation policies limit the possibilities for deep building renovations. For instance, in some cases, homeowners are not allowed to install RES plants or

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making changes on the façades which may compromise the building aesthetic. Deep building renovation that does not compromise the building aesthetic characteristics is usually more expensive, and less affordable for homeowners. Less important are the “National complexity of regulatory procedures (bureaucracy)” (20% in the category of high influence and 80% in the moderate-high influence) and the “Local political stability” (16% in the category of high influence). The “National competition regulation for companies” has a low impact on the home renovation, with 16% of preference in the category of moderate-low influence and 16% in the low influence.

- Economic factors with an indirect influence on the home renovation marketplace

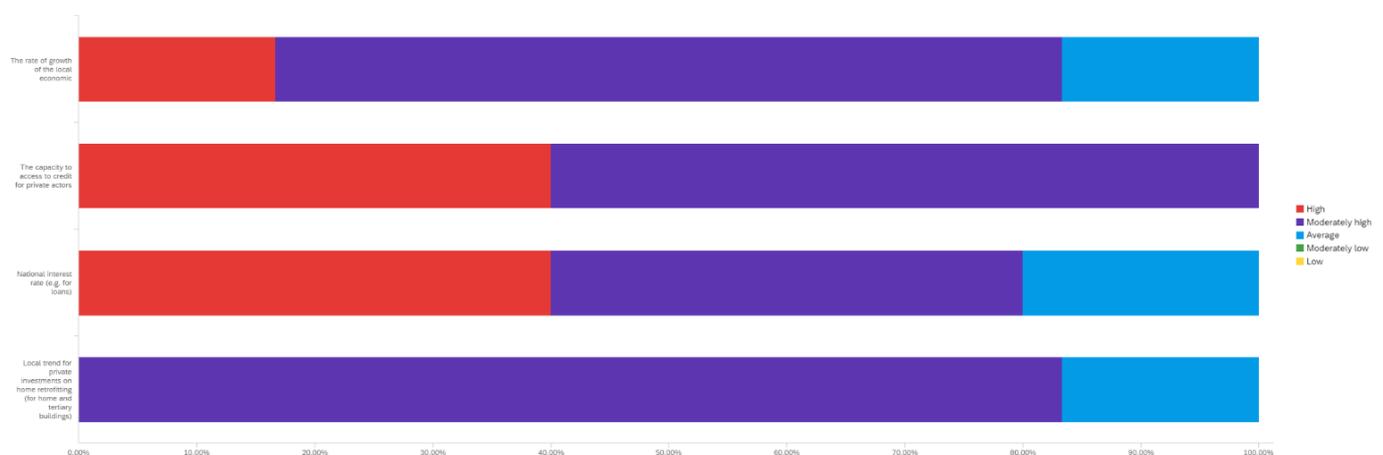


Figure 4 Share of Economic factors relevance. In red high relevance, Moderate-high relevance in purple, Average in light blue, Moderate-low relevance in green and in yellow the low relevance.

According to respondents, the economic factors which most influence home renovation are the “Capacity to access credit for private actors” (40%), and the “National interest rate (e.g. for loans)” (40%). This is linked to the home renovation high costs. The fiscal rebate which is the most used financial mechanism in Italy requires that homeowners provide the up-front payment for the renovation. Thus, the capacity to access credit becomes extremely relevant. The “Local trend for private investments on home retrofitting” (83% of preferences in the moderate-high influence field) is also a key factor. Where the local trend for private investment is low, the OSS finds an unfavourable market for its services. The last factor is the “Rate of growth of the local economy”, which less affect the home renovation market, maybe due to the huge presence of public incentives. Governments worldwide are now shaping recovery paths to contrast the COVID-19 pandemic effects, which have a strong impact on the economy. Italy launched the so-called “Decreto rilancio” (Decreto Legge n. 34/2020) setting-up specific measures to support the national economy. Those refer also to home renovation and home retrofitting. However, the effective impacts of those measures are still unknown.

The COVID-19 pandemic and the restriction's measures strongly affect the families' income, reducing the capacity to afford home renovation works and daily-life costs, for instance, energy bills for electricity and heating. The energy poverty phenomenon could increase due to the pandemic crisis. The temporary policies to support families with low-income may not be enough to face the emergency and further impacts in terms of energy poverty raising. In Italy, ARERA (Regulatory authority for energy, networks, and environment) manages the electricity and gas bonus in order to contrast the energy poverty. In the North-east area, where Padova is located, there are 125.000 low-income families who receive the electricity bonus and 106.000 families with the heating bonus in 2018 (ARERA, 2019). The raise of low-income families due to the COVID-

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19 should ask for increasing the efforts in terms of home energy efficiency in order to reduce energy bills and improve comfort. The energy poverty also affects human health, so the home energy efficiency process is a key factor to contrast disease and reduces public health costs.

- Social factors with an indirect influence on the home renovation marketplace

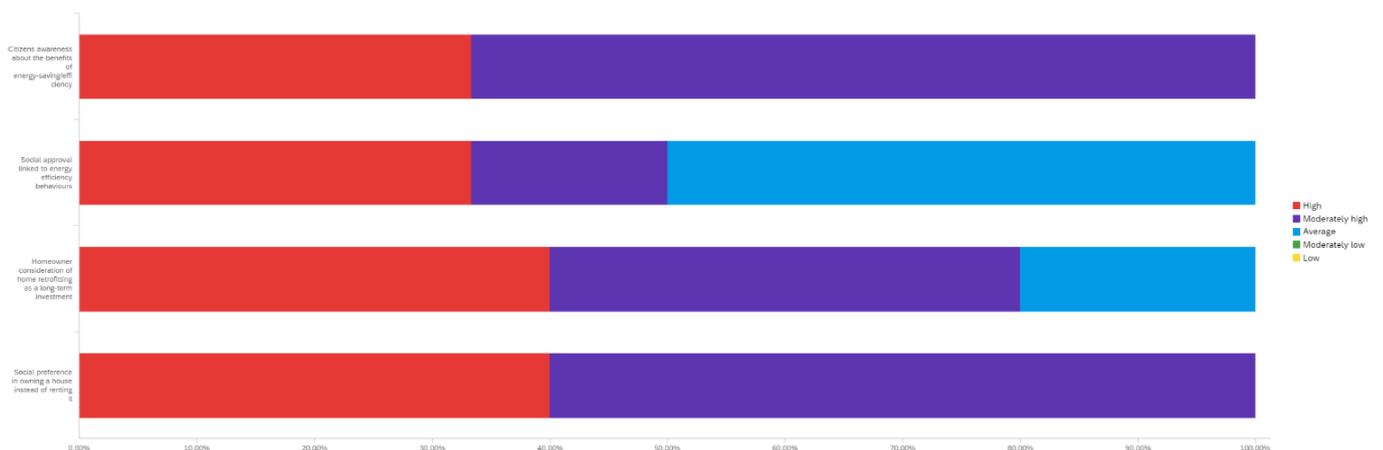


Figure 5 Share of social factors relevance. In red high relevance, Moderate-high relevance in purple, Average in light blue, Moderate-low relevance in green and in yellow the low relevance.

The two main social factors affecting the home renovation market are the “Social preference in owning a house instead of renting it” (40%) and the “Homeowner consideration of home retrofitting as a long-term investment” (40%). Homeownership is a critical factor in the field of renovation, first because owners play a decisive role in giving support to the refurbishment initiative, both in terms of motivation and economic investment. It is amply recognised also from the literature (Weiss et al, 2012; Wilson et al, 2015; Pardo-Bosch et al, 2019). In owner-occupied homes, the costs and benefits of the refurbishment match, and households are more motivated to invest in their own comfort, and in reducing energy bills. The homeownership factor rises in relevance in Italy, due to the lack of measures to split the benefits/costs between tenants and homeowners. In Padova the rate of homeownership is around 80% (PadovaFIT EXPANDED D.4.2), showing a favourable condition for the OSS. The “Citizens awareness about the benefits of energy-saving/efficiency” also has a high impact on the home renovation trend (33%). The last factor is the “Social approval linked to energy efficiency behaviours” (33%). Even when costs and benefits are clear, people persist in displaying irrational tendencies. Indeed, social approval influences people behaviours within a society that shapes what is desirable. People are generally influenced by others and tend to follow norms reflecting what is socially approved and/or common.

- Technological factors with an indirect influence on the home renovation marketplace

Technological factors	High	Moderately high	Moderately low	Low
Solar thermal, including solar hot water and space heating	0%	60%	0%	0%
Condensing boilers	0%	50%	0%	0%
Solar electric, or photovoltaic (PV), systems	0%	50%	0%	0%
Biomass systems	0%	33%	17%	17%
Electric vehicles	0%	33%	0%	67%
Geothermal heat pumps	0%	20%	20%	40%
District heating/cooling systems	0%	17%	50%	33%
Energy storage systems (e.g. home or grid-scale batteries; thermal storage)	0%	17%	0%	67%
Heat pumps (air to air and water heat pumps)	0%	17%	17%	0%
Vehicle to grid technology	0%	17%	33%	33%
Cogeneration systems or combined heat, cooling and power (CHP)	0%	17%	50%	17%

Table 4 Diffusion rate of technologies. Bold values indicate the most interesting results.

In the Padova area, the questionnaire results show a high diffusion of high energy performance heat systems and RES plants for housing (solar electric and thermal systems, heat pumps, etc.). Those show high potential for the home residential renovation process and the OSS services design. From the analysis emerges a low diffusion of innovative and integrated technologies (“Electric vehicles”, “Energy storage systems”, “Vehicle to grid technologies”) which can have a higher impact on the city energy transition. However, those technologies are less attractive for homeowners, due to the impossibility to recognise the short-term benefits compared to the high costs. The decision to invest in such technologies is not highly supported by public incentives, and it is more linked to people awareness. For instance, the electric vehicles purchasing is fostered by public incentives, but without integrated strategies in terms of public infrastructures and public charging stations, the new technology is less attractive for citizens.

3.1.3. DIRECT INFLUENCE FACTORS

- Regulatory measures

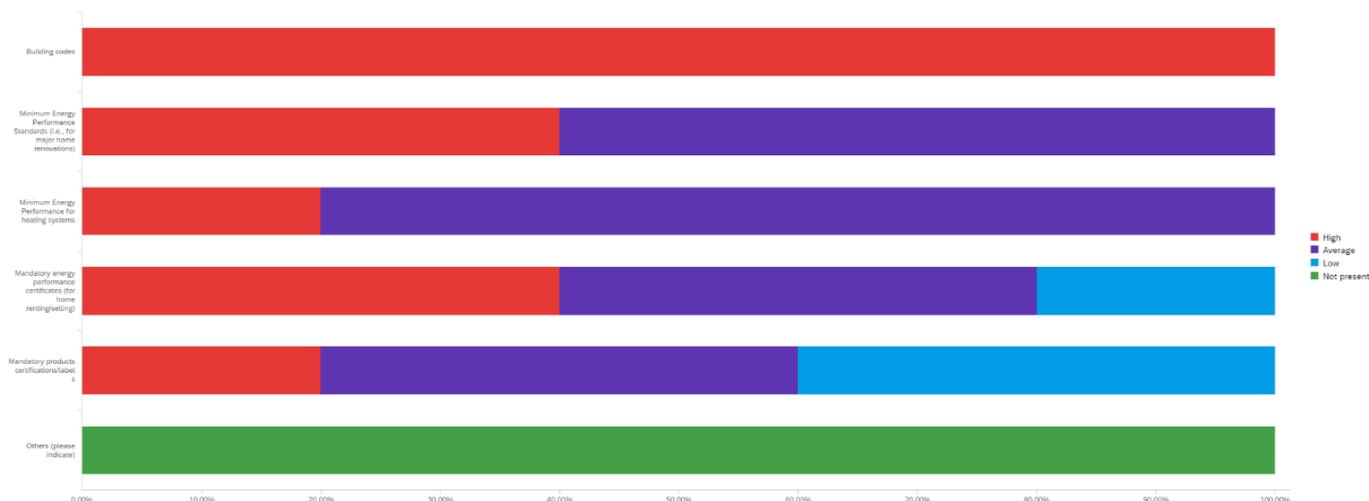


Figure 6 Regulatory measures relevance in affecting homeowners' behaviours. In red high relevance, Moderate-high relevance in purple, Average in light blue, Moderate-low relevance in green and in yellow the low relevance.

The results show some differences between regulatory measures that affect homeowners' behaviours and home energy efficiency improvement. The presence of "Building codes" (100% of preference) and "Mandatory energy performance standards for new buildings and major renovations" (50% of preference) affects more the behaviours dimension than the certification and labels (EPC and products labels).

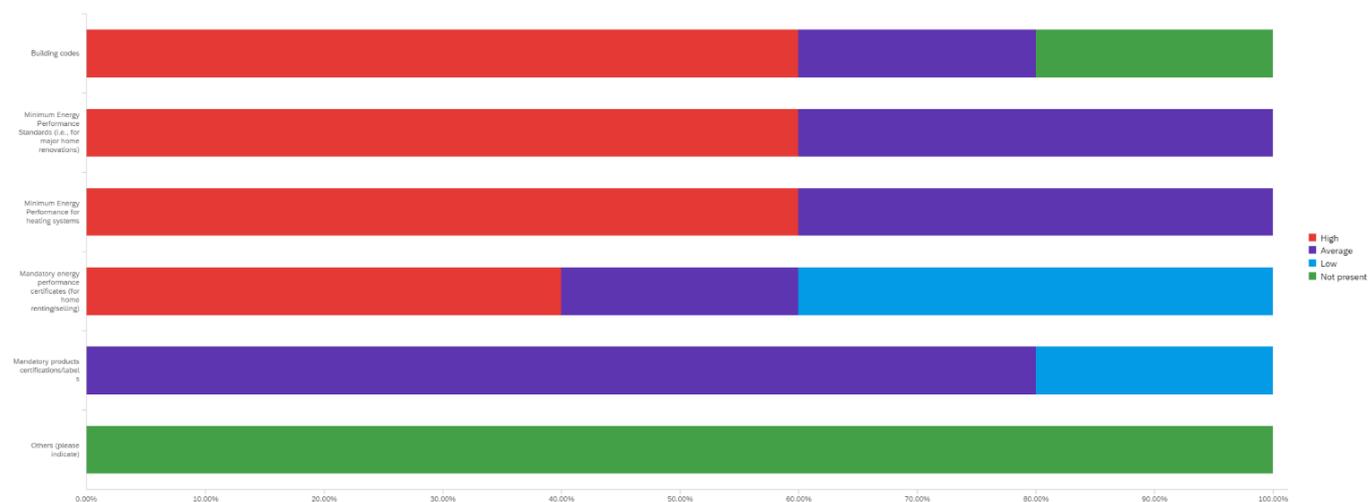


Figure 7 Regulatory measures relevance in boosting home energy efficiency. In red high relevance, Moderate-high relevance in purple, Average in light blue, Moderate-low relevance in green and in yellow the low relevance.

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Conversely, measures that require the achievement of high energy performances, like the “Minimum energy performance standards” (60% of preference), the “Minimum energy performance standards for heating systems” (60%) and the “Building codes” (60%) have a high impact on boosting home energy efficiency. Also in this case, the presence of “Mandatory certifications and labels” do not have a high impact on the home retrofitting process.

According to respondents, homeowners have moderate-high difficulties in reaching information related to regulatory measures. They agreed with the need for the OSS to provide information access and support in understanding norms and duties (100% of respondents).

From the questionnaire emerges the need to set up specific mechanisms to split incentives between owners and tenants in case of energy refurbishment, which should be defined in the rental agreement, in order to support home renovation in rented houses.

- Public incentives and subsidies

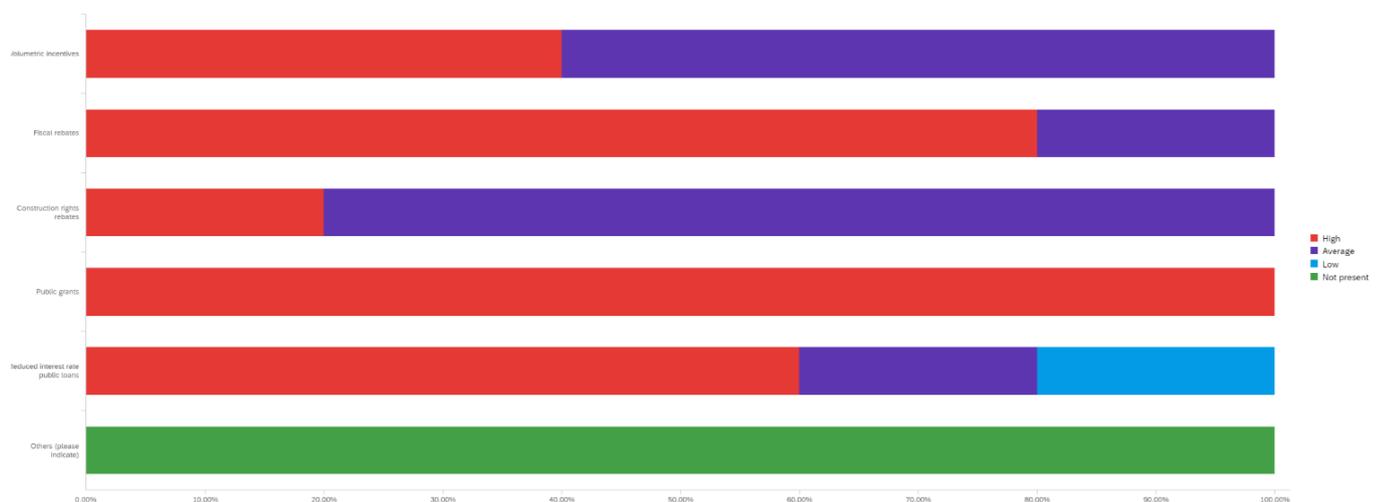


Figure 8 Public incentives relevance in affecting homeowners' behaviours. In red high relevance, Moderate-high relevance in purple, Average in light blue, Moderate-low relevance in green and in yellow the low relevance.

D.2.2. STRATEGIC ASSESSMENT

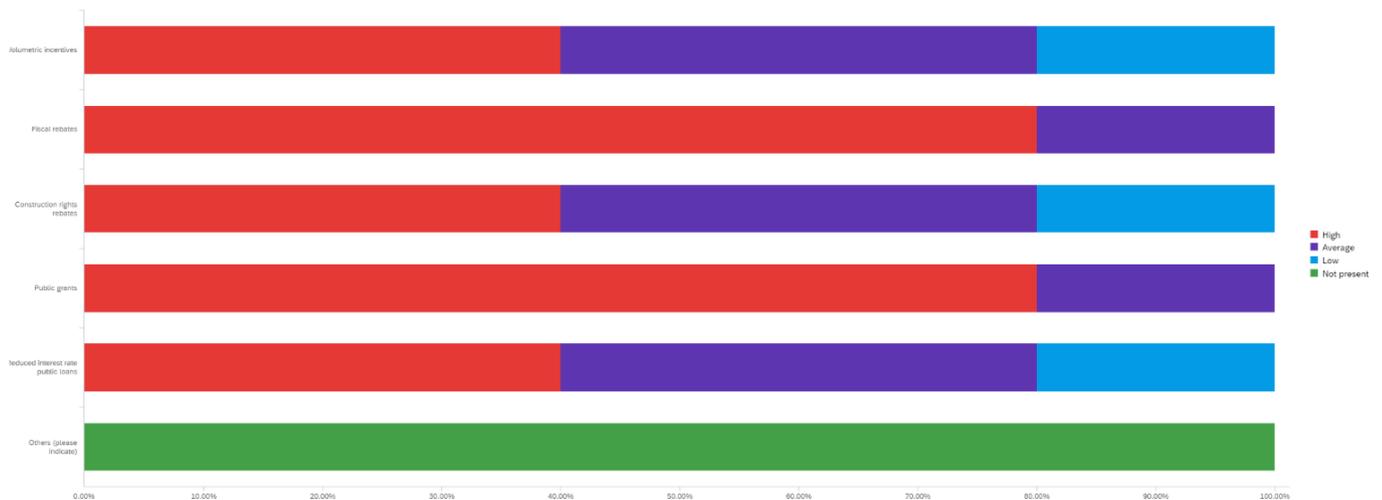


Figure 9 Public incentives relevance in boosting home energy efficiency. In red high relevance, Moderate-high relevance in purple, Average in light blue, Moderate-low relevance in green and in yellow the low relevance.

For the public incentives and subsidies dimension, there are few differences between measures with a high impact on homeowners' behaviours and energy efficiency improvements. In both cases, the most affecting factors are connected to the presence of "Public grants" (100% high relevance in affecting homeowners behaviours and 80% high relevance in boosting EE), "Fiscal rebates" (80% high relevance in affecting homeowners behaviours and 80% high relevance in boosting EE) and "Reduced interest loans" (60% high relevance in affecting homeowners behaviours and 40% high relevance in boosting EE). "Volumetric incentives" and "Construction right rebates" have less impact, maybe because they are linked to new buildings and major renovation works, which are less recurring. For instance, in Padova municipality, the home renovation rate is around 1%, and in Italy, the annual rate of new construction is between 1-1,5% (Cresme, 2020). These figures confirm the low influence of incentives focus on new buildings and major renovation projects.

The responses show moderate-high barriers in reaching information related to incentives measures. Information is subjected to numerous changes, also annually, which makes the accessibility very difficult for non-experts. Homeowners have not enough professional skills to find information and understand it, also due to the overabundance of measures. The respondents recognize the need to provide support in accessing information as well as in the grants' applications process (100% of preference).

- Technical instruments

The questionnaire results are in line with ENEA (2019), which yearly reports the status of the home renovation in Italy. According to ENEA (2019) in the period 2014-2018, 334.000 refurbishment interventions received public fiscal incentives (fiscal deduction) in Italy: 14.000 are related to doors and windows replacements, 90.000 to heating system substitutions, and 70.000 to solar shading installations. Those types of interventions are characterized by low costs and high efficiency, with a cost between 9 to 10 cents for each kWh of energy saved during the entire life of the intervention.

Technical instruments	High	Average	Low	Not present
Home automation	0%	20%	80%	0%
Energy audit	0%	40%	60%	0%
RES plants installation	20%	60%	20%	0%
Integrated interventions	0%	80%	20%	0%
Windows replacement and insulation	100%	0%	0%	0%
Walls insulation	40%	60%	0%	0%
Roof insulation	40%	60%	0%	0%
Facade renovation (multi-family housing)	40%	60%	0%	0%
Heat and cooling system replacement	80%	20%	0%	0%
Others (please indicate)	0%	0%	0%	100%

Table 5 Technical instruments relevance in affecting homeowners' behaviours. Bold values indicate the most interesting results.

In the Padova area, the most affecting interventions in terms of behaviours changing and energy efficiency are the "Windows replacements", the "Replacement of heating systems", the "Walls and roofs insulations" and the "Façade renovations". The "RES plants installation", the "Integrated renovation projects" and the "Home automation" have less impact on the homeowner's behaviours.

Technical instruments	High	Average	Low	Not present
Windows replacement and insulation	100%	0%	0%	0%
Walls insulation	80%	20%	0%	0%
Roof insulation	80%	20%	0%	0%
Heat and cooling system replacement	80%	20%	0%	0%
Integrated interventions	80%	20%	0%	0%
Facade renovation (multi-family housing)	60%	40%	0%	0%
Energy audit	40%	40%	20%	0%
Home automation	20%	60%	20%	0%
Others (please indicate)	0%	0%	0%	0%

Table 6 Technical instruments relevance in boosting home energy efficiency. Bold values indicate the most interesting results.

"Integrated and deep renovations" have instead a higher impact in boosting energy efficiency in the building sector (80% of respondents). An interesting result is the moderate-low impact of Energy audit (60% low relevance in affecting homeowners' behaviours and 20% low relevance in boosting EE). This result differs from the literature, which considers the energy audit as a key instrument to drive homeowners' decisions and encourage them to invest in home renovation. The low impact of energy audit may be linked to the lack of awareness or the lack of direct incentives to cover the costs. It also can refer to the "bad" image of Energy audit in Italy, due to the lack of skills for technicians and the consequent low quality of services.

The results show moderate-high difficulties in reaching information related to technical services and instruments. The respondents confirm the need to provide support in accessing technical services (100% of respondents) and provide direct technical services to homeowners (60% of respondents), in order to overcome the fragmentation of the home renovation chain and guarantee quality of works.

D.2.2. STRATEGIC ASSESSMENT

- Finance instruments

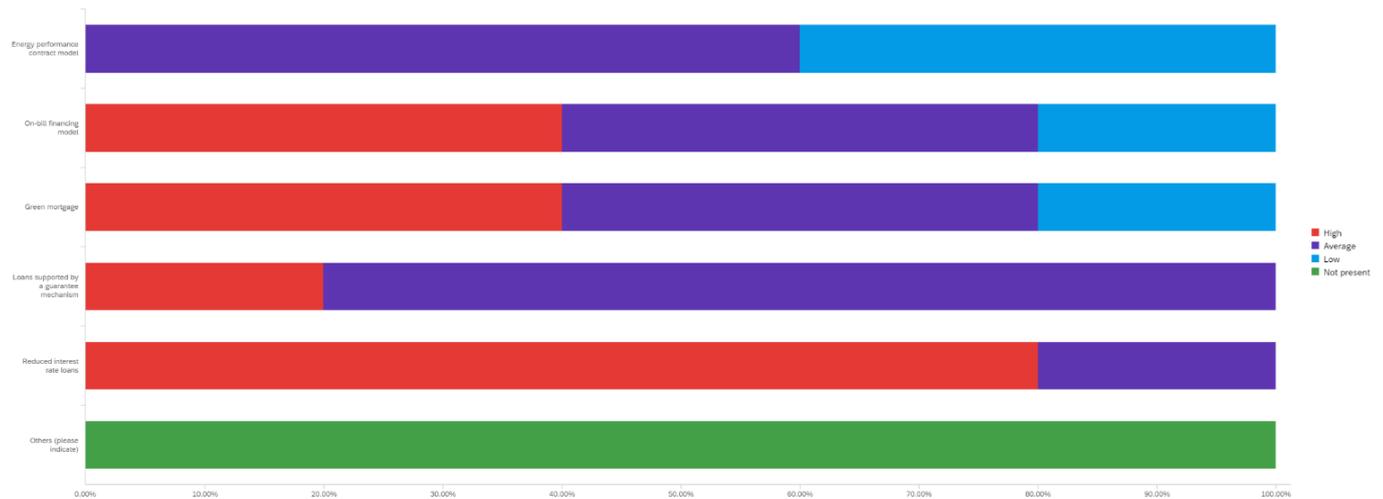


Figure 10 Finance instruments relevance in affecting homeowners' behaviours. In red high relevance, Moderate-high relevance in purple, Average in light blue, Moderate-low relevance in green and in yellow the low relevance.

“Reduced interest loans” have a high capacity to influence homeowners' behaviours (80% of preference), followed by the “On-bill financing model” (40%) and the “Green mortgage” (40%). Lower impacts are connected to “Loans supported by guarantee mechanisms” (20%) and “Energy performance contract model”, that are also less common in the municipality.

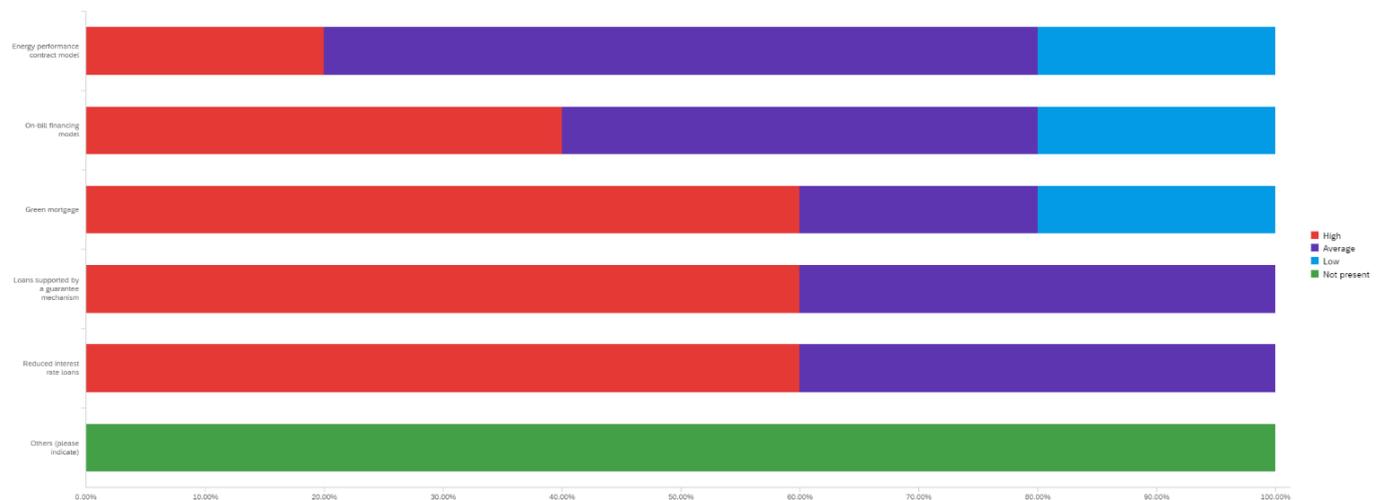


Figure 11 Finance instruments relevance in boosting home energy efficiency. In red high relevance, Moderate-high relevance in purple, Average in light blue, Moderate-low relevance in green and in yellow the low relevance.

For boosting home energy efficiency, the most influencing finance instruments are the “Loans supported by guarantee mechanisms” (60%), the “Reduced interest loans” (60%), and the “Green mortgage” (60%). The results are relevant especially for families with low-income, who are likely to grow due to the Covid-19 effects

D.2.2. STRATEGIC ASSESSMENT

on the economy. According to respondents, the “On-bill financing model” and the “Energy performance contract model” can have a lower impact in the home renovation process.

There are many difficulties in reaching information from the homeowner side, due to the novelty of these financial instruments. Respondents agreed with the need to provide support in accessing finance instruments (100% of respondents), supplied by financial institutions and ESCOs. The OSS should also work as a mediator and act as a guarantor, in order to reduce the investment risk for banks and increase access to credit.

- The real estate market

The Italian real estate market is gradually recovering, with an increase in demand and residential construction activities, with many differences between regions and cities (Pwc, 2019). Residential is the main asset class, which represents approximately 90% of the total transactions and stock. Restructuring activities count 73.2% of the entire construction sector, with an increase of 1.5% per year (Cresme, 2020). New residential constructions, new tertiary constructions and public works are all growing, thanks to public incentives and financial measures. According to ENEA (2019), the quality of the sale buildings is increasing (22% of buildings sold in 2018 are in Class A and B). In the Padua area, respondents confirm the high relevance of the Energy Performance Certificate (EPC) for increasing the value of the real estate, both for selling (40% of respondents) and renting (20% of respondents). It is a mandatory document for home transactions and is well reported in advertisements (60%). These figures show a dynamic sector that gives high value to energy efficiency. COVID-19 pandemic can also have relevant impacts on the real estate market, decreasing the value of properties due to the economic crisis and decreasing the rate of home purchasing. The uncertainty of the impacts needs further analyses in the next months.

3.1.4. MARKET SEGMENTATION AND LOCAL PLAYERS

The questionnaire asked to identify OSS potential customers existing in the area and the potential players operating in the territory. The territorial context can go beyond the municipality borders. Indeed, competitors, complementary business, suppliers, financiers, etc. can deliver their services from other cities and regions (i.e. ESCOs, Bank institutions, Energy companies, Foundations, etc.). Market segmentation, on the other hand, should have a local or metropolitan dimension, in order to take directly advantages from the OSS services.

Results (Figure 6) show a high presence of potential suppliers (especially in the design process and manufacturing sector) and partners (especially professional boards, associations and constructions operators). Potential customers regard mainly homeowners, followed by homeowners/tenants’ unions and building managers and facility managers. Companies working within the building chain (developers, construction companies, designers) are not seen as potential customers for the OSS, as well as utilities and manufacturers. They can be considered as indirect beneficiaries of OSS activities. However, next stakeholder engagement activities will better assess the roles. According to the respondents, there are few financiers, mainly Banks and financial operators, ESCOs, Utilities and Foundations.

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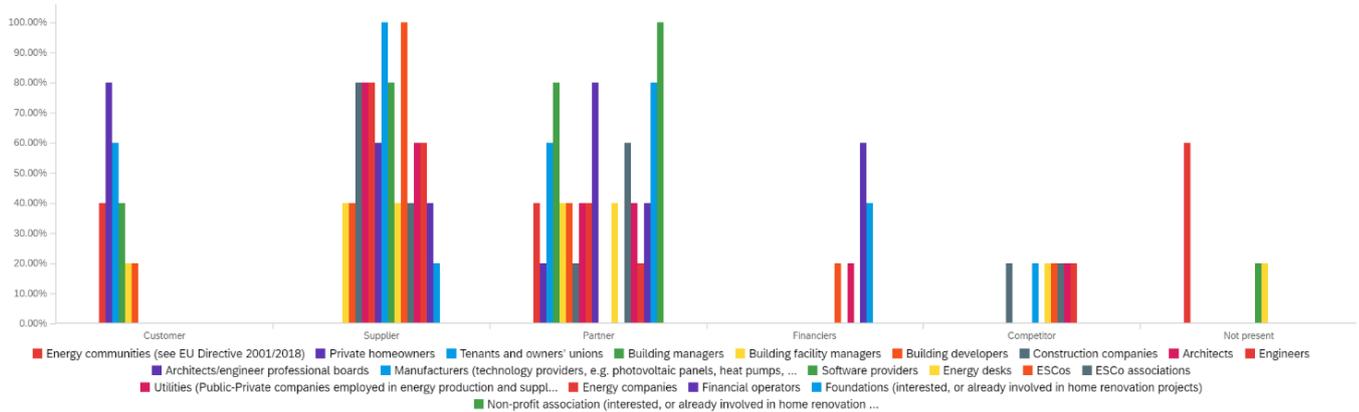


Figure 12 Local market segmentation and potential players in the home renovation.

The questionnaire asked also to rate the level of interest in the OSS services. The results show high interest from private homeowners, homeowners/tenants' unions, and building managers and facility managers. The construction sector also seems to have a high interest in the OSS. Less interest is represented by design services providers, followed by ESCOs, Energy communities, Utilities, and Manufactures. This lower interest may refer to a strong presence of these actors in the market which would not be affected by a new actor like the OSS. Energy companies and Software providers show a low interest, also due to the low relevance of home automation technologies in home renovation projects (see the technical instrument analysis). In general, the questionnaire highlights a moderate-high interest in the OSS services, which build a favourable condition for the new business launch. However, further analyses are requested in order to better identify the grade of interest. In the next months, focus groups will be planned with local actors and stakeholders.

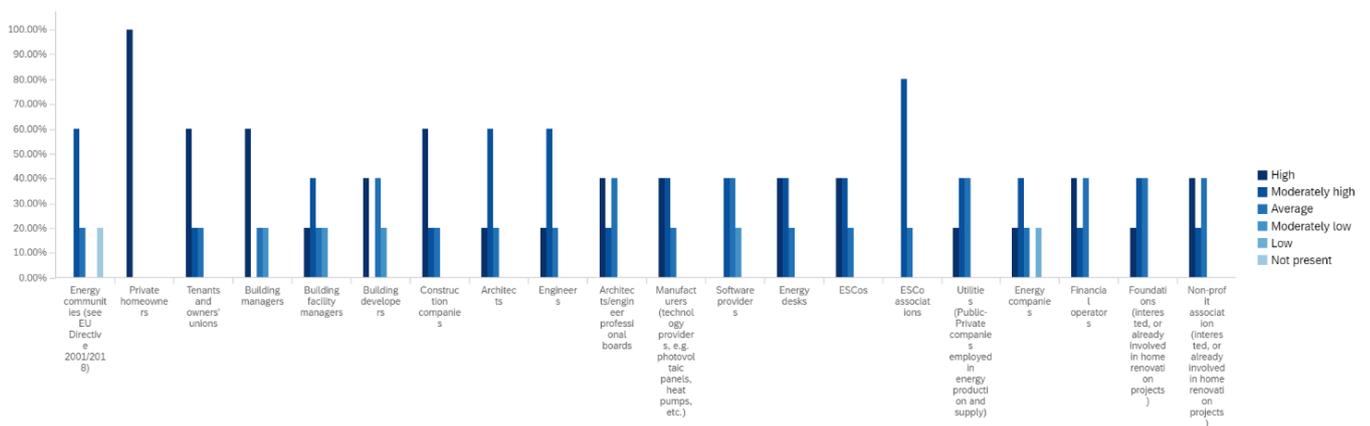


Figure 13 Local costumers and players potential interest in the OSS services.

3.2 Timisoara area

3.2.1. OVERVIEW OF THE TARGET AREA

The results reported in this section coming from the study on literature and two questionnaires: one delivered to Timisoara Municipality and one online survey delivered to local actors involved in the home renovation chain. For the Timisoara target area, the online questionnaire produced 20 responses: 6 from government agencies, 5 from consulting firms, 5 from non-profit associations, 3 from universities, and 1 from an energy utility.

- Building stock

Timisoara is the main economic, social, and cultural centre in the western part of Romania. The city is the capital of Timiș County, which borders Serbia and Hungary. The municipal area of Timisoara occupies 130 km², which account for 13% of the wider metropolitan area, and has a density of 2.350 inhabitants/km². Timisoara is one of the few cities that did not lose people in the last decade (Bose et al, 2013).

In Romania, the housing stock has an average age quite high: 35% of houses are built before 1960, 55% between 1961-1990, and only 10% are built between after 1991 (BPIE, 2011). Housings in Romania record big heat losses, which translates into an increase in urban energy consumption (Government of Romania, 2015). The existing housing stock has significant potential in terms of energy efficiency standards, which points out the importance of residential building renovation programmes in particular for multi-family houses in urban areas. Approximately 58% of the existing multi-family houses (about 2,4 million apartments) built before 1985 require restoration and thermal modernisation (Energy Charter Secretariat, 2003).

98% of residential buildings are private, of which 95% are occupied by owners. The majority of residential buildings (56%) are single-family houses, equally spread in urban and rural areas. Multi-family dwellings make up 39% of the total, mostly in urban areas (Economidou et al, 2019).

Romania's energy consumption per capita is almost twice as low as the average in the EU (Bose et al, 2013). In Romania does not exist an EPC register/database at the national or regional level, this brings difficulties in estimating the trend of home renovation and energy saving, as well as the buildings energy consumption. According to SEAP (2010), the building sector consumes 49% of the total energy consumption in 2008 and produce 46,22% of the total CO₂ emission.

District heating provides a significant percentage of the heating and hot water in urban dwellings in Romania and is in many cases owned by municipalities (Government of Romania, 2015). In Timisoara, the district heating supplies thermal energy to 72.000 apartments, about two-thirds of the population. In residential buildings, firewood and biomass represented the main energy material used. Natural gases represent the second important form of energy utilized in the residential sector (Rugina & Lazar, 2012).

Few data are available regarding the home renovation rate at the municipal level. In the residential sectors, owners implement several small renovation interventions (also energy efficiency-related), like windows replacement, walls insulation, roofs/basement insulation. Sometimes these interventions are carried on without construction permission. In general, it is possible to estimate that the renovation process is higher for single-family houses than condominiums.

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Moreover, many condominiums have carried out insulation interventions on the rooftop in the last decades. In some cases, where the building's structure allowed, an attic floor was added by private investors. In these cases, homeowner's associations allowed the private investors to create additional apartments which would subsequently be sold by the investors. The homeowners get advantages of such interventions, which also increase building energy efficiency. Investors cover all the costs and finance the roof and walls insulation for the whole building.

- Legislative and regulatory framework

Romania has recently developed and approved the Integrated National Energy and Climate Plan for the period 2021-2030. The plan establishes the renovation of a larger percentage of buildings with low energy performance, in order to achieve higher energy efficiency by 2030. The strategy focuses mainly on condominiums renovation (with higher potential for EE improvements):

- Annual renewal rates 2021 - 2030 from 0.69% to 3.39%,
- Annual renewal rates 2031 - 2040 of 3.79%
- Annual renewal rates 2041 - 2050 of 4.33% (INECCP, 2018).

There are several other laws and strategies approved by the government that explicitly address the energy efficiency in the building sector. The main documents are the following:

- The National Law 372/2005 addressing the energy performance of residential buildings. All new buildings, existing public buildings and major renovations works must obtain the Building Energy Performance Certificate. Also, the Law recommends the use of renewable energy sources for new buildings with a surface of more than 1000 m²,
- The Energy Strategy of Romania for the period 2007- 2020 (Government Decision 1069/2007) which sets targets to reduce energy intensity by 41% through 2020,
- The Program for increasing energy efficiency in multi-family houses, approved by the Emergency Government Decision 1661/2008. The Ordinance establishes the works necessary for thermal insulation of houses built between 1950 and 1990, way of financing, as well as obligations and responsibilities for public authorities and owners' associations,
- The National Strategy for Romania's Sustainable Development 2013-2020-2030 (Government Decision 877/2018), which aims to implement the Sustainable Development Agenda 2030, providing a roadmap for the 17 Sustainable Development Goals,
- The Program for the improvement of energy efficiency (PIEE) approved in 2020 (Government Decision 2.168/2019), regarding the Residential buildings sector. The Program considers: the thermal rehabilitation of housing blocks; the installation of thermal meters (if applicable); the replacement of old heating systems; and the implementation of pilot projects. The local goals are established by local authorities, only for cities with more than 20.000 inhabitants.

At the Local level, in accordance with the National Law, the Local Council approved the Strategic Plan called "Program for Improving the Energy Efficiency for the Municipality of Timisoara" in 2018. This document exclusively concerns public buildings (headquarters, educational and health buildings), and it does not mention the private residential sector. For the building sectors, Timisoara has approved in 2010 the

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Sustainable Energy Action Plan, promoted by the Covenant of Mayors. The plan is now under revision, in order to integrate the climate dimension.

Also, at the local level was approved the Integrated Strategy for Development of the Growth Pole Timisoara 2015-2020 (Government Decision 8/2019) which includes important measures regarding energy efficiency in the public and residential sectors. The strategic document aims to increase the number and amount of investments to facilitate access to utility networks and improve the efficiency of existing infrastructures.

The local building code does not integrate energy strategies, except for the obligation for new buildings to achieve minimum energy performance, in accordance with the National Law 372/2005. Volumetric incentives and Construction rights rebates are not provided by local authorities.

The General Urban Master Plan only partially integrate energy strategy and regulation. A new General Master Plan is under development, which will implement two urban programmes in order to reduce the CO₂ emissions and improve the air quality: The Energy Efficiency Programme, and The Promotion of Renewable Energy Sources Programme. The coherence and integration between policies and strategies are particularly relevant for Timisoara. Indeed, in Timisoara, a great urban expansion, following the economic and population growth after the 1989 Revolution, has increased the pressure on the environment and physical infrastructures. The risks of urban sprawl and energy inefficiencies are particularly high for the city. Spatial and urban planning can help to promote a more compact development pattern, which means lower costs for public transportation, water, energy, heat, and gas delivery, solid waste management, etc. The actual situation brings to the need for rethinking the link between the built environment and the quality of urban life, in order to increase the integration between strategies and policies.

- Economic and fiscal measures

In Romania, the financial measures supporting home renovation focus mainly on public funding, grants and subsidies. The public financial support is provided by European, National and Local administration funds. Loans and soft loans are available and are supported by state guarantees. The guarantees represent a useful solution for countries where financial intermediaries are reluctant to fund energy efficiency projects due to high perceived risks, especially to medium and low-income families, like in Romania.

The National Multiannual Program for the Thermal Rehabilitation of the Residential Buildings built between 1950 and 1990 is one of the main measures supporting home refurbishment since 2005. It aims to increase the energy performance of buildings and improving the quality of life for inhabitants. The key beneficiaries of the program are owners' associations. The renovation work is financially supported by the Government's state budget (50%), the local budget (30%), and by owners' associations (20%). The percentage of 20% is divided between all the owners in accordance with the home surface. If one or more owners cannot pay, the local administration can cover the difference (Rugina & Lazar, 2012). The law allows tax exemptions on residential buildings for owners who have performed rehabilitation work from their own funds.

Timisoara was one of the beneficiaries of the Residential rehabilitation program coordinated by the Ministry of Regional Development and Public Administration. Between 2008 and 2010, 64 residential buildings built between 1950 and 1989 received financial support for thermal insulation work. Currently, 765 residential buildings have requested financial support from the City Hall to insulate the apartments (Rugina & Lazar, 2012).

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Following the success of the rehabilitation program, the Government thought about reducing the public funding accessible for such projects, and loans with government guarantee were made available. According to Emergency Ordinance 69/2010, homeowners' associations must have 10% down payment, while the rest is covered from a bank loan (Government of Romania, 2015). The owners' associations pay back the loan from the savings obtained over the heating bills before the thermal insulation work is complete. This new program includes old buildings built between 1950 and 1990, those developed after 1990, and individual homes.

The recent change in the financing mechanism opens to new measures, like tax rebates and fiscal incentives, but the novelty of such solutions brings to a reduction of interventions, creating a more complex situation for the homeowners also in terms of bureaucracy. However, a transition period is needed to increase the appeal of those new solutions.

Timisoara already experiments tax breaks solutions. The City Council provides tax breaks for seven years for homeowners who perform rehabilitation and thermal insulation works (Bose et al, 2013). Some tax breaks are also provided to owners who replace the heating systems with renewable energy ones by installing solar panels, heating pumps, and individual micro-heating units running on biomass. Also, owners who renovate the façades benefit from tax breaks for five years (Bose et al, 2013).

Another public financial measure in force in Romania is the Green House Program. This program finances heating systems replacement with solar energy, geothermal energy and wind energy systems. The purpose of this program is to improve air quality by reducing water and soil pollution caused by burning wood and fossil fuels used for heating and hot water production. The beneficiaries of this fund are households, Local administrations and public institutions. In order to benefit the incentive, the renovation must include the whole building. At the end of the works, the owners must achieve a minimum energy performance reported in the EPC and the work costs must be covered exclusively by homeowners before the end of the year (Rugina & Lazar, 2012).

The Government establishes also social protection measures, helping low-income residents pay the heating bills. The Government is supporting people who use the district heating system, as well as heating systems using renewable sources. The financial aid for single people and families with low income can range between 10 and 90%. Local city budget can also provide financial support between 7% and 63% of the total heating bill.

Table 7 Public financial measures in Timisoara for residential and commercial buildings

Measures	Type	Beneficiaries	Level
National Programme for Improvement of Energy Performance in Apartment Blocks	Public grants/Subsidies	Owner-occupiers	National

D.2.2. STRATEGIC ASSESSMENT

Thermal rehabilitation of residential buildings financed by bank loans with a government guarantee	Loans	Public administrations, housing associations, owner-occupiers	National
Green House Program	Public grants	Owner-occupiers	National
Local tax breaks	Tax break	Owner-occupiers	Local

3.2.2. INDIRECT INFLUENCE FACTORS

- Political factors with an indirect influence on the home renovation marketplace

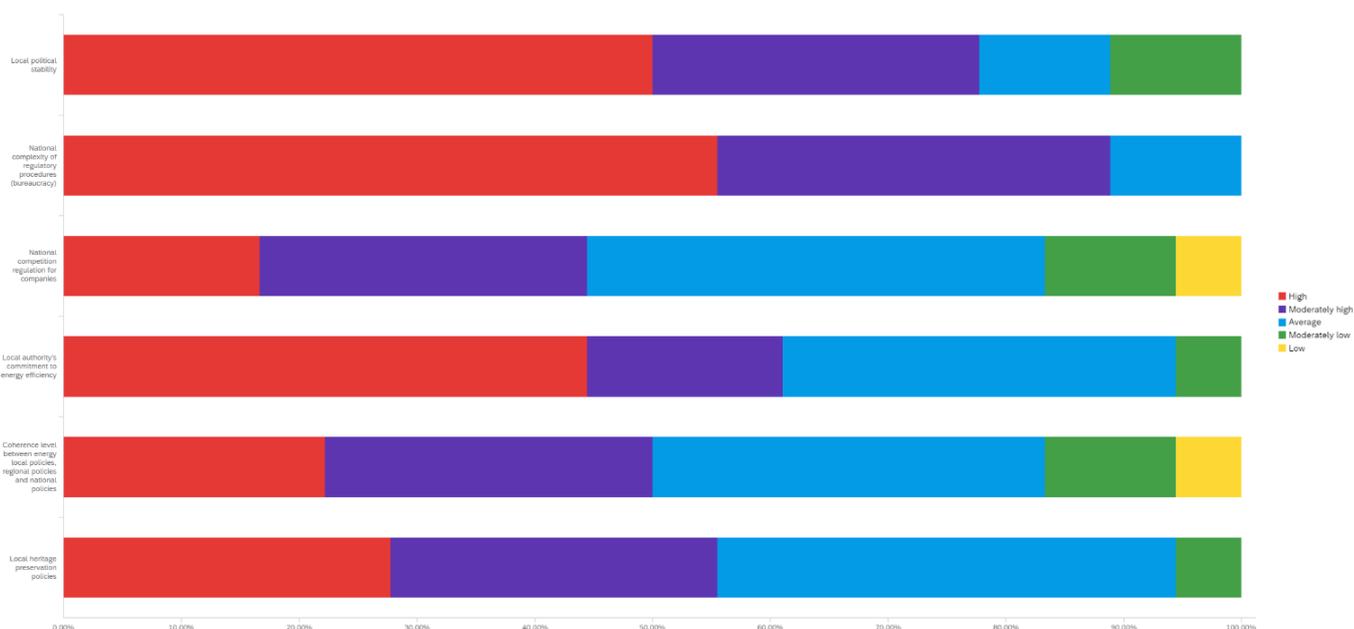


Figure 14 Share of Political factors relevance. In red high relevance, Moderate-high relevance in purple, Average in light blue, Moderate-low relevance in green and in yellow the low relevance.

According to respondents, the main factors influencing the home renovation market are “The national complexity of regulation procedures” (55% of preference), the “Local political stability” (50%), and the “Local authority’s commitment to energy efficiency” (44%). Those three factors are strictly connected to the recent change in terms of financial mechanisms. The change increased the difficulties to access public incentives and calls for higher involvement of local authorities in order to facilitate the home renovation processes. A low influence is connected to the “Coherence level between energy local policies, regional policies and national policies” and the “National competition regulation for companies”. Also, the “Local heritage preservation policy” has a moderate-low impact on the home renovation market. This result is interesting, considering the

wide historical heritage of Timisoara. However, it could reflect the low integration of energy strategies within the local building code.

- Economic factors with an indirect influence on the home renovation marketplace

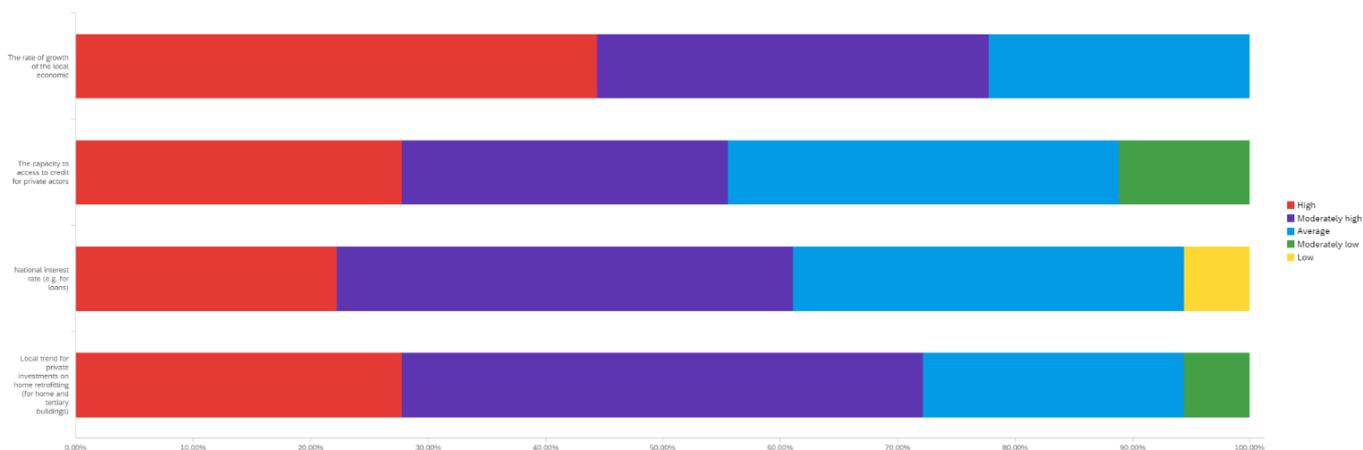


Figure 15 Share of Economic factors relevance. In red high relevance, Moderate-high relevance in purple, Average in light blue, Moderate-low relevance in green and in yellow the low relevance.

After decades of economic restructuring and political change, Romania has taken significant steps toward catching up the economic performance of more developed European countries. Although radical reforms brought about significant changes in recent years, the standard of living of Romanians is still behind the EU average (Bose et al, 2013). The huge share of families with low-income negatively affects the investments in home renovation. The questionnaire results follow what emerges from the literature, identifying the “Rate of growth of the local economy” and the “Capacity to access credit for private actors” as the main factors to influence the marketplace. The last one is a crucial element for home renovation in Romania. Indeed, the government has developed a guarantee mechanism to support access to credit for homeowners, decreasing the perceived risks for the bank institutions. The “Local trend for private investments on home retrofitting” also has a high impact (28%). The home renovation rate increased in the last years, thanks to several financial programs. Several houses have submitted the request to access public grants for refurbishment works. This creates a favourable situation for the OSS establishment in terms of users’ interest. The “National interest rate for loans” has instead a moderate low impact, according to respondents, maybe due to the presence of loans and soft loans supported by state guarantees.

D.2.2. STRATEGIC ASSESSMENT

- Social factors with an indirect influence on the home renovation marketplace

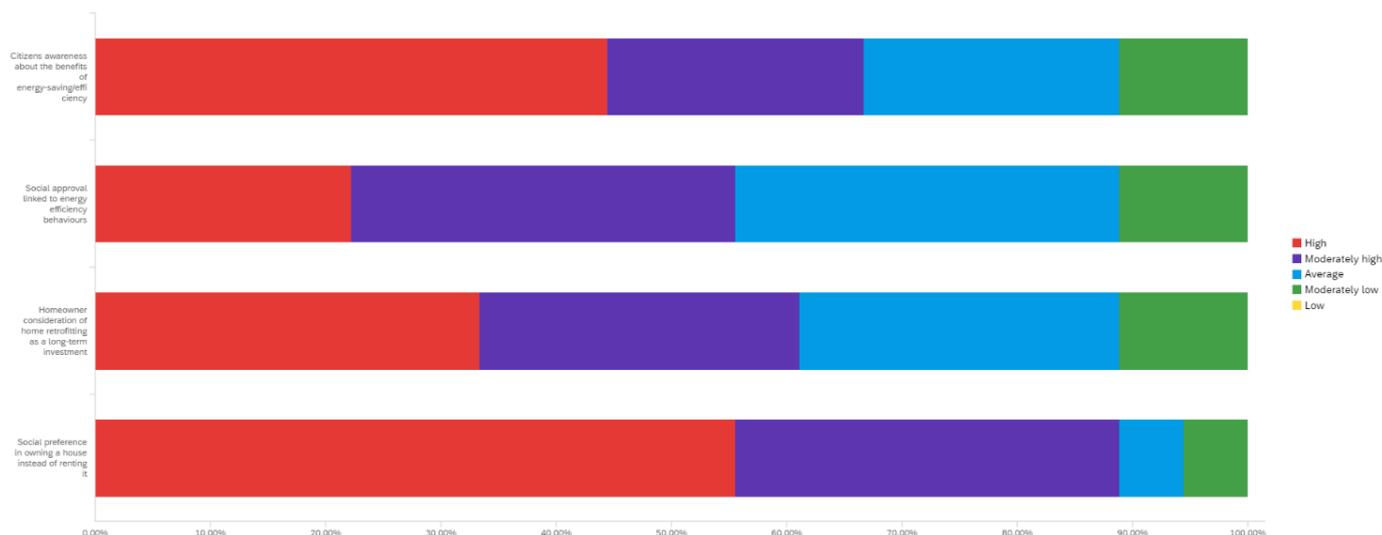


Figure 16 Share of Social factors relevance. In red high relevance, Moderate-high relevance in purple, Average in light blue, Moderate-low relevance in green and in yellow the low relevance.

In Romania, 95% of buildings are owner-occupied, representing a potential strength for the OSS implementation. The questionnaire results show a high impact linked to this factor (57% of preference), followed by the “Citizens awareness about the benefits of energy-saving” (45%). Since 2005 in Romania several policies and financial programs supported homeowners in refurbishing their houses, but still many barriers exist, in particular regarding the lack of information and awareness (Rugina & Lazar, 2012). The changing in the financial mechanism requires higher efforts in terms of private investments. Hence, the “Consideration of home retrofitting as a long-term investment” is seen as a key factor for increasing the number of private investments. The “Social approval linked to energy efficiency behaviours” seems to have a lower impact on the marketplace, despite the high rate of owner-occupied houses.

- Technological factors with an indirect influence on the home renovation marketplace

Technological factors	High	Moderately high	Moderately low	Low
Geothermal heat pumps	0%	5%	16%	74%
Energy storage systems	0%	0%	21%	68%
Vehicle to grid technology	5%	0%	26%	58%
Electric vehicles	0%	10%	37%	47%
Heat pumps (air to air and water heat pumps)	0%	10%	10%	42%
Biomass systems	5%	5%	37%	42%
Cogeneration systems or combined heat, cooling and power	0%	16%	26%	26%
District heating/cooling systems	10%	31%	10%	11%
Solar thermal, including solar hot water and space heating	10%	21%	37%	21%
Solar electric, or photovoltaic (PV), systems	15%	5%	37%	16%
Condensing boilers	5%	44%	11%	5%

Table 8 Diffusion rate of technologies. Bold values indicate the most interesting results.

D.2.2. STRATEGIC ASSESSMENT

The results show a low diffusion of technological systems in the target area. This is particularly evident for geothermal heat pumps and energy storage systems (both private and collective). Romania has the 3rd highest geothermal potential of European nations, with major potential locations on the Western Plain, where Timisoara is situated (Bose et al, 2013). Many financial programs, like the Green House Program, has been implemented by the Government to foster the installation of RES plants in private housings. However, the diffusion of all RES production systems (solar thermal panels, heat pumps, biomass systems, and cogeneration systems), is still low, with consequent high prices for new technologies. The respondents assign the responsibility to the lack of a strong national strategy to sustain the green energy production. The unique technologies with a higher diffusion are the “Condensing boilers”, the “PV panels” and the “District heating”. It accounts for a significant percentage of the heating and hot water in urban dwellings. Approximately 22% of all cities and towns in Romania use a district heating system, supplied by natural gas and fossil fuels (Government of Romania, 2015). New technologies and integrated systems have a low diffusion, such as electric vehicles and vehicle to grid technology, even though since 2011 the Government launched a Program to stimulate the car-renewal with funding from the National Environment Fund (Bose et al, 2013). Through this program, citizens receive a bonus of about 900 euro for vehicle replacement in the form of vouchers that can be used only for acquiring new cars, also electric cars.

3.2.3. DIRECT INFLUENCE FACTORS

- Regulatory measures

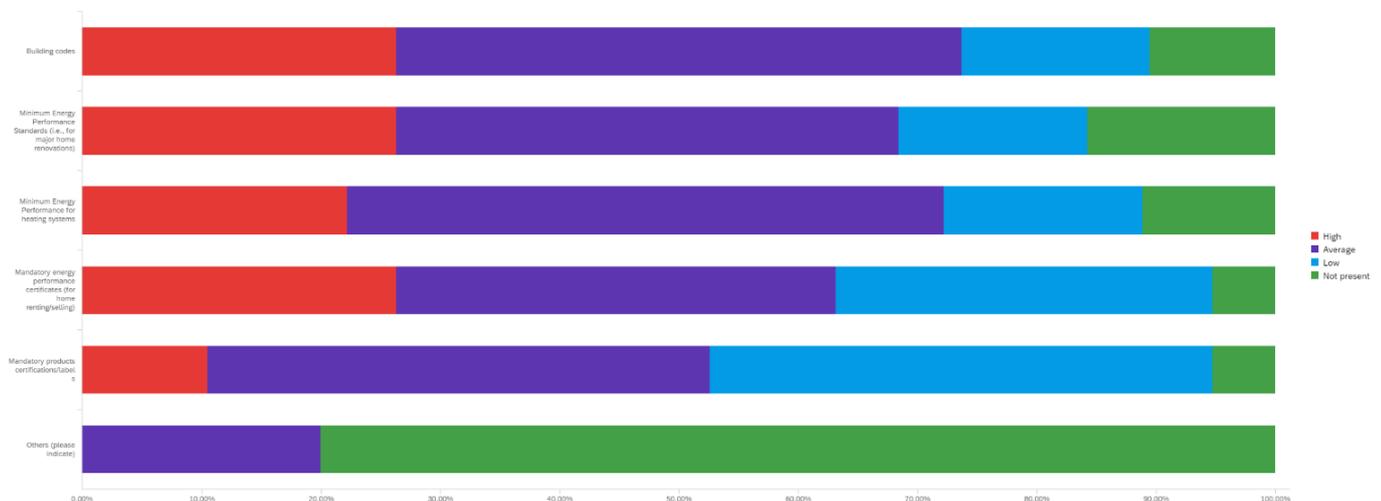


Figure 17 Regulatory measures relevance in affecting homeowners' behaviours. In red high relevance, Moderate-high relevance in purple, Average in light blue, Moderate-low relevance in green and in yellow the low relevance.

Some differences emerge between regulatory measures that affect homeowners' behaviours and energy efficiency in buildings. The results show that the most influencing factors for homeowners behaviours are the “Mandatory minimum energy performance standards for buildings and heating systems” (26% and 22% of preference in the high relevance field) and the “Mandatory EPC for selling and renting homes” (26%). The “Local building code” has also a moderate-high impact on behaviours changing with a 27% of preference in the high relevance field and 47% in the moderate-high field. “Labels for products and services” have a lower impact, according to respondents.

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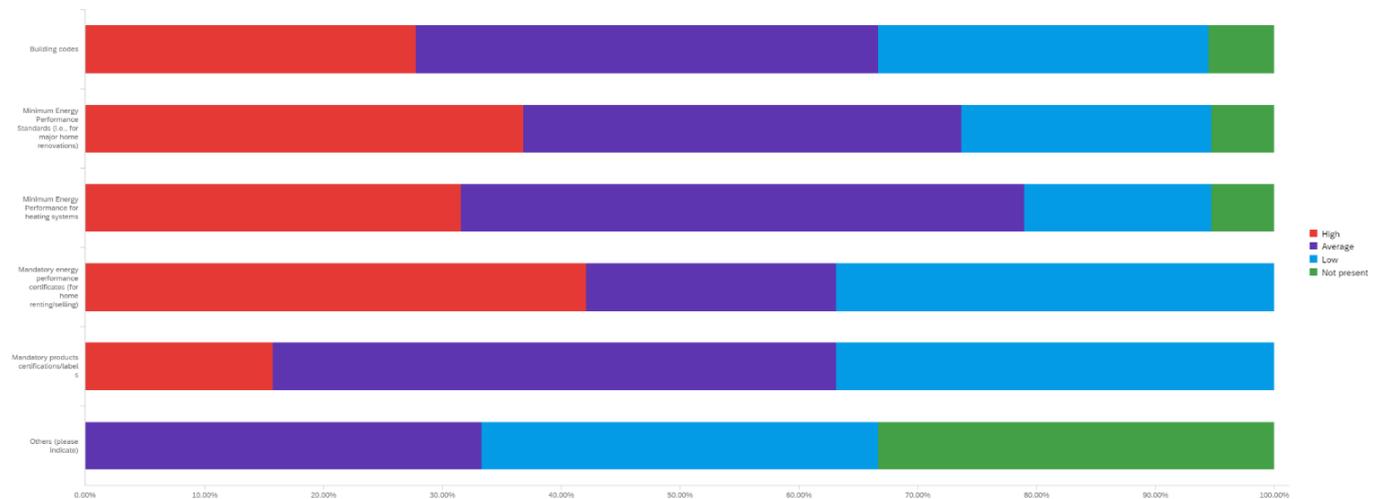


Figure 18 Regulatory measures relevance in boosting home energy efficiency. In red high relevance, Moderate-high relevance in purple, Average in light blue, Moderate-low relevance in green and in yellow the low relevance.

Conversely, the energy efficiency is mostly affected by the “Mandatory EPC for selling and renting housing” (42% of preference in the high relevance filed) and the “Mandatory minimum energy performance standard for buildings and heating systems” (37%). This can be related to a more consolidated presence of these measures in Romania. The “Building codes” have also a moderate-high impact on boosting energy efficiency, even if the results show some contradictions. “Labels for products and services” show the lowest impact in boosting home energy efficiency.

According to respondents, homeowners have moderate-high difficulties in reaching information related to regulatory measures. They agreed with the need for the OSS to provide access to information and support in understanding norms and duties (84% of respondents).

D.2.2. STRATEGIC ASSESSMENT

- Public incentives and subsidies

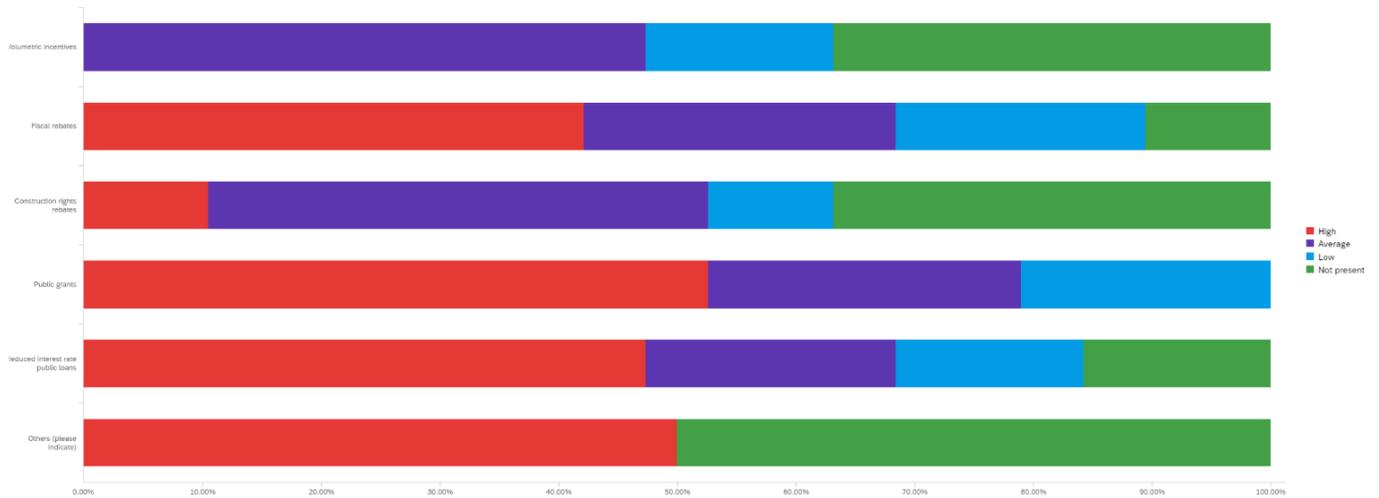


Figure 19 Public incentives relevance in affecting homeowners' behaviours. In red high relevance, Moderate-high relevance in purple, Average in light blue, Moderate-low relevance in green and in yellow the low relevance.

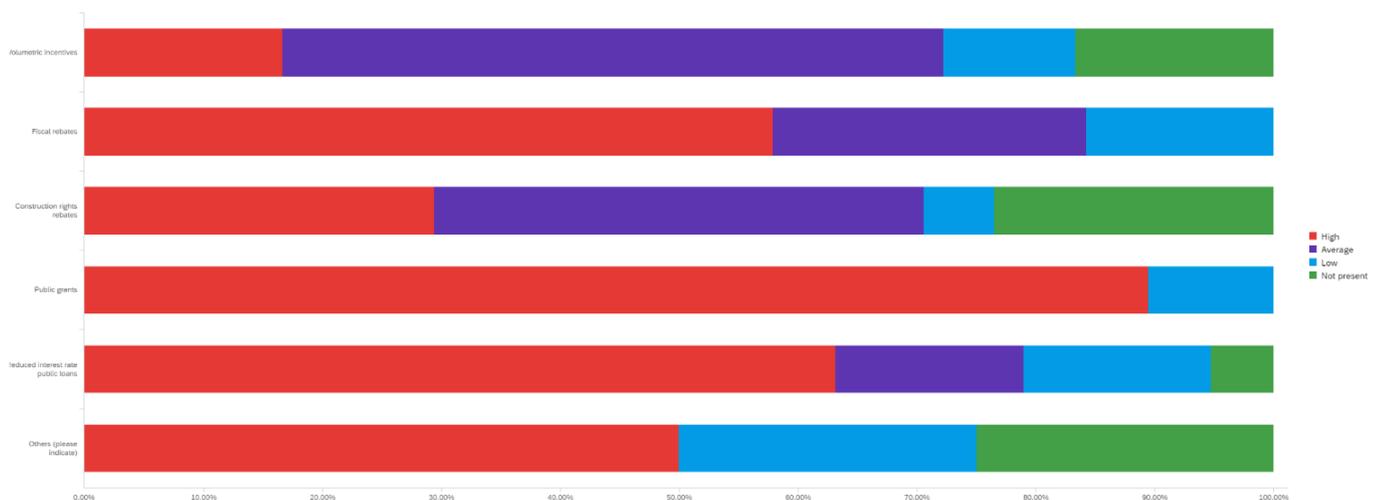


Figure 20 Public incentives relevance in boosting home energy efficiency. In red high relevance, Moderate-high relevance in purple, Average in light blue, Moderate-low relevance in green and in yellow the low relevance.

The most affecting incentive measures for people behaviours and energy efficiency are “Public grants”, which covered in the last years almost all home refurbishment works in Romania. The grants come from National and Local funds, and in part from EU funds and owners’ associations (around the 20% of the entire cost). According to the literature and the questionnaire results, this was the most common way to support the home renovation. “Loans with government guarantees” and “Fiscal rebates” are less used. However, the questionnaire shows a potentially high impact in boosting energy efficiency. At the moment, they are available only at the Local level through tax breaks. “Construction rights rebates” and “Volumetric incentives” for new buildings or major renovations are not available in the country. However, the results show a high potential

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impact in both cases. The decrease of the national financial capacity brought to reduce the public investment in home renovation. This change increases the difficulties in gaining grants and makes the process more complex for homeowners, with long waiting time procedures. Respondents suggest that the OSS should provide support to access information and grants, supplying consulting services along the whole process (89% of respondents).

- Technical instruments

Technical instruments	High	Average	Low	Not present
Home automation	16%	11%	61%	11%
RES plants installation	11%	28%	50%	11%
Integrated interventions	22%	22%	39%	17%
Energy audit	23%	41%	29%	6%
Walls insulation	78%	11%	11%	0%
Roof insulation	72%	22%	5%	0%
Facade renovation (multi-family housing)	50%	44%	5%	0%
Heat and cooling system replacement	44%	50%	5%	0%
Windows replacement and insulation	89%	11%	0%	0%
Others (please indicate)	0%	0%	0%	100%

Table 9 Technical instruments relevance in affecting homeowners' behaviours. Bold values indicate the most interesting results.

The technical instruments which most affect homeowner's behaviours and building energy efficiency are almost the same. The most impacting instruments are the "Windows replacement and insulation", the "Roof, walls and façade insulation" and the "Heat and cooling system replacement". Technical instruments with lower impact in both cases are the "Integrated interventions", the "Home automation" and the "RES plants installation". The latest is connected to the lack of a strong national strategy for RES production, reported by respondents, which brought to a low diffusion of new technologies based on renewable sources. The price for these technologies is still not affordable for many families and there are few incentives to support the purchasing. Moreover, the wide share of district heating systems makes the stay-alone RES technologies less attractive for homeowners.

Technical instruments	High	Average	Low	Not present
Windows replacement and insulation	94%	5%	0%	0%
Walls insulation	72%	22%	5%	0%
Roof insulation	67%	28%	5%	0%
Heat and cooling system replacement	61%	27%	11%	0%
Facade renovation (multi-family housing)	50%	44%	5%	0%
Integrated interventions	44%	28%	22%	5%
Energy audit	29%	53%	17%	0%
Home automation	28%	33%	28%	11%
Others (please indicate)	0%	33%	0%	67%

Table 10 Technical instruments relevance in boosting home energy efficiency. Bold values indicate the most interesting results.

D.2.2. STRATEGIC ASSESSMENT

The questionnaire shows high information barriers. The OSS should provide mainly information related to energy efficiency benefits, according to respondents (88%). The low awareness level emerged from the literature suggests for the OSS a crucial role in making information available and in supporting homeowners in the decision-making process. The respondents consider also important for the OSS to deliver directly technical services to homeowners (80% of preference).

- Finance instruments

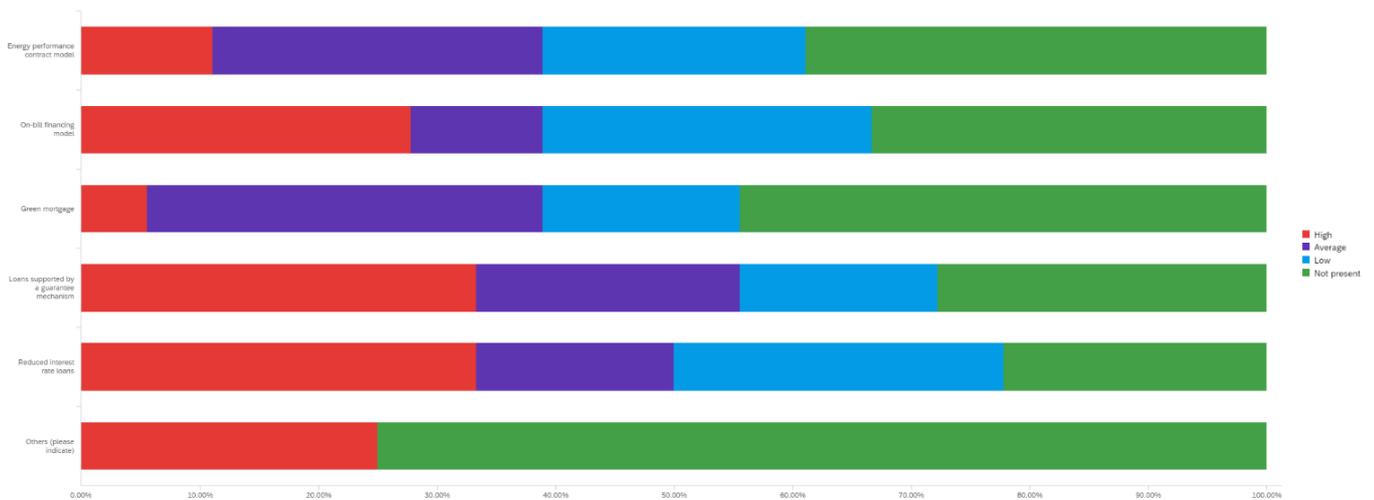


Figure 21 Finance instruments relevance in affecting homeowners' behaviours. In red high relevance, Moderate-high relevance in purple, Average in light blue, Moderate-low relevance in green and in yellow the low relevance.

In order to encourage homeowners to start a home renovation the most influencing finance instruments are the "Loans supported by a guarantee mechanism" (35% of preference) already available in Romania, the "Reduced interest loans" (35%), and the "One-bill financing models" (29%). The "Energy performance contract model" and the "Green mortgage" are not common in Romania and have a low impact on people behaviours.

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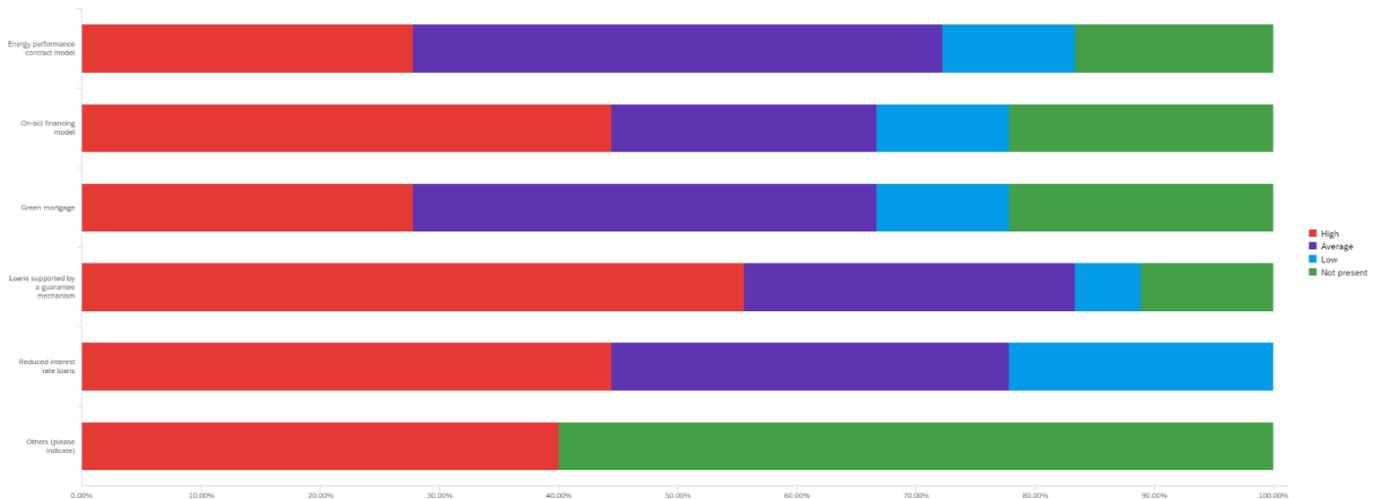


Figure 22 Finance instruments relevance in boosting home energy efficiency. In red high relevance, Moderate-high relevance in purple, Average in light blue, Moderate-low relevance in green and in yellow the low relevance.

The survey shows similar results in boosting energy efficiency. The respondents identify in the “Loans supported by a guarantee mechanism” and in the “One-bill financing models” the most affecting finance instruments, with 52% and 47% of preference, followed by the “Reduced interest loans” (45%) and the “Energy performance contract model” (29%). The green mortgage has, also in this case, a lower impact.

The questionnaire results show high difficulties to get information about innovative financial tools, due to their novelty and the low presence of companies providing them (see section 3.2.4). The respondents suggest that the OSS should provide support to access finance instruments (88% of responses) and direct financial services to homeowners (88%).

- The real estate market

The Energy Performance Certificate (EPC) is mandatory for selling and renting homes in Romania. The EPC is a relevant factor to drive purchasing choices, more for home renting than for selling. In both cases, it increases the value of properties, but according to respondents, it is rarely indicated in advertisements (50% of respondents). The results show a favourable situation for the OSS, also considering the high propensity in owning a house and the value attributed to them, which can improve the interest in the OSS services. The analysis of the literature (Rugina & Lazar, 2012, Government of Romania, 2015) shows an increasing interest in energy efficiency, which is reflected in the real estate market. The willingness to pay for added value generated by energy performance is linked to the need to save operating expenses and the desire to have a modern, healthy, comfortable property.

3.2.4. MARKET SEGMENTATION AND LOCAL PLAYERS

Figure 13 shows the customers and players distribution between a list of potential local actors for the OSS business. According to respondents, there are many potential OSS partners in the target area, mainly related to Design services, Energy desks, Building managers, ONG associations and Foundations, Construction companies and Utilities. In Romania, the energy sector is composed of several players. There are quite a few

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companies in charge of production, a significant number of distributors, and a noteworthy number of suppliers (Government of Romania, 2015). The major electricity operator in Timisoara is Enel, an Italian energy group operating in Romania since 2005. The company is one of the largest private investors in Romania in the energy field. The manufacturing sector is also very significant in the Country and in Timiș County, where Timisoara is located. The questionnaire displays a wide presence of potential OSS suppliers, like Software providers, Technical and technologies providers, and companies operating within the building sector.

The analysis on the market customers presents many different segments, grouped into 5 main categories: homeowners/tenants, owners associations, professional boards, building managers and building developers. In Timisoara, the Management Energy Association (AME), the Federation of the Property Owners Associations, the Timisoara Chamber of Commerce, have increased their relevance and commitment in fostering energy efficiency (Bose et al, 2013). Moreover, training centres have been opened in order to provide specialized courses in EE, RES production, and Passive Houses for designers and construction companies, showing an increasing interest in education and training services.

The presence of OSS competitors is low. Few energy service companies are active in Romania, despite the high potential for energy efficiency improvements. The questionnaire also shows a low presence of potential financiers, mainly linked to bank institutions and energy companies. An interesting local actor could be Colterm company. Colterm manages the district heating system, which supplies thermal energy to two-thirds of the citizens in Timisoara. The company is now involved in a large refurbishment work to improve the efficiency of the system. It can represent a good partner and financier for the OSS.

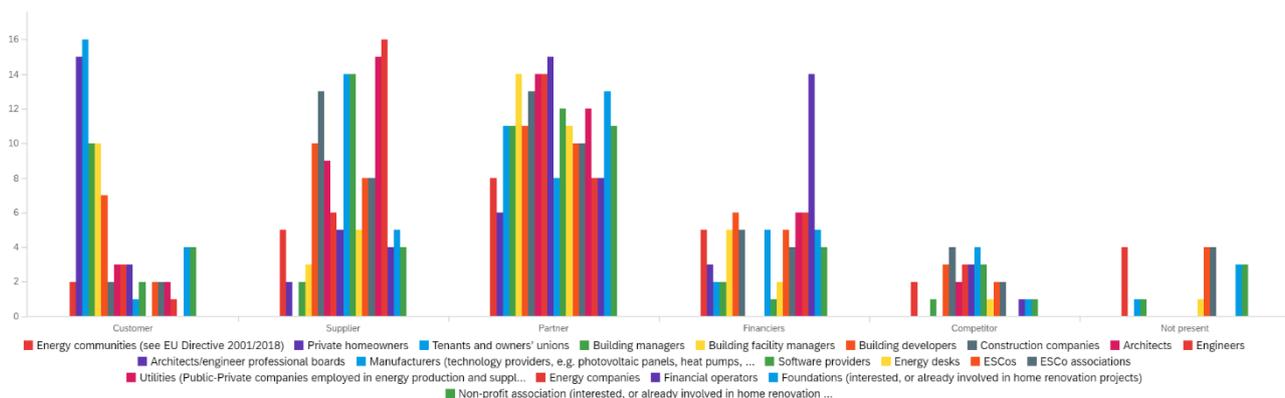


Figure 23 Local market segmentation and potential players in the home renovation.

Figure 14 shows the share of interest in the OSS services. The higher interest comes from private homeowners, followed by building managers and building facility managers, owners associations and utilities. The design sector and the building sectors also present a moderate-high interest for the OSS establishment. The local situation appears favourable for the OSS in terms of potential interest. Further analysis of the market segmentation and players composition is needed to better understand the effective market dimension.

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This is crucial to design OSS services which can follow the contextual need and expectations.

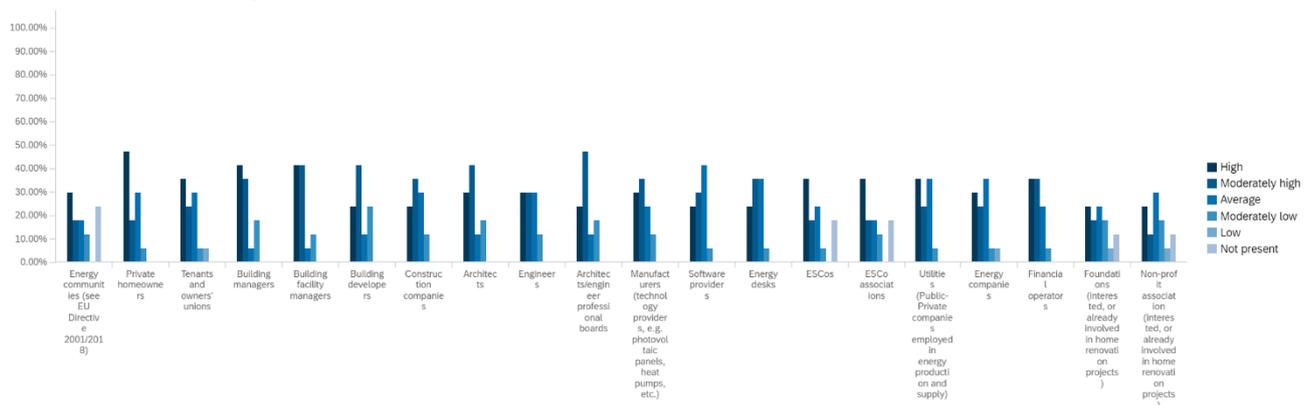


Figure 24 Local costumers and players potential interest in the OSS services.

3.3 Bulgarian cities – Smolyan and Vidin Municipalities

The results reported in this section coming from the study on literature and two questionnaires: one delivered to Vidin and Smolyan local authorities and one online survey delivered to local actors involved in the home renovation chain. At this stage of the project, only aggregated results will be reported, in order to understand the main factors affecting the home renovation market in Bulgaria. Data will be used to prepare an Action Plan by the Bulgarian Energy Agency of Plovdiv for the launching of sound one-stop-shop in two Bulgarian cities.

For Vidin and Smolyan, the online questionnaire produced 14 responses: 4 from construction companies, 4 from non-profit associations, 2 from consulting firms, 1 design firm, 1 from an SME association; and 2 from government agencies.

3.3.1. OVERVIEW OF THE TARGET AREA

- Building stock

According to the 2011 National Census, there are about 3.9 million dwellings in Bulgaria, 66% of which are in urban areas, and 34% in rural areas. Despite having more housing units than the number of households, over 40% of households live in overcrowded conditions. At the same time, the housing vacancy rate is 30% at the national level (Worlds Bank, 2017).

Most of Bulgaria's housing stock is old socialist-era multifamily buildings, many of which are made of prefabricated panels blocks. A large boom in construction has taken place between 1961 and 1990 (BPIE 2011). This means that more than three-fourths of housings are older than 30 years. According to the last National Census (2011), the dwellings with low energy performance are 83,7% of the total.

The lack of maintenance of these buildings has led to their rapid deterioration. This brings to low-quality buildings, with leaking roofs, damaged facades, ill-maintained stairwells and hallways, and leaking water and sewer pipes (Georgiev, 2015). There is an overall lacking responsibility, non-payment of fees especially related to the poorer residents, and dissatisfaction about the buildings' conditions and service levels. In

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Bulgaria, many families lie below subsistence level with huge differences in income levels among residents. Low-quality building conditions also depend on structural problems. The integrity of prefabricated panels blocks relies on the metal “links” that hold the panels together. The metal links deteriorate after 50 years, decreasing the structural safety of buildings and extent the risk for householders (World Bank, 2017). Even if this risk is unclear the problematic is highly perceived in the country. Another critical issue in Bulgaria is the number of informal and illegal settlements, with people living in low-quality housing with inadequate infrastructure (Vassilev & Spassova, 2015).

Today, 97.6 % of the housing stock is privately owned (National Census, 2011), ranking above the average value in the EU countries, which is 70.1% (BPIE, 2011). Most people live in their own property. The Bulgarians have a deep aspiration for possessing their dwelling, however, they are not fully aware of the market-based significance of the dwelling as an investment, they do not recognize the need of making efforts for maintaining and improving its market value (Georgiev, 2015). Only a small percentage of Bulgarians, rent at market price. In contrast, the share of Bulgarians renting at a reduced rate or living in a dwelling unit free of charge is 14.6%, which is 4% higher than in the EU-28 countries (Eurostat, 2018).

In 2018 the energy consumption in Bulgaria increase compared to the previous years but still in line with a long-term trend of decreasing demand³. Compared to the European average, the energy mix of Bulgaria has a higher use of solid fuels (34.1% vs 16.2%) and nuclear (20.5% vs 13.6%) and lower share of petroleum and products (21.6% vs 34.5%) and gases (13.4% vs 22%) whereas the share of renewables is roughly similar (10.3% vs 12.9%) (European Commission, 2017). The overall energy import dependency of Bulgaria is well below the EU average, with a deficit in fossil fuels and a surplus in electricity. In terms of energy production, Bulgaria electric production capacities covered a great part of the electric power deficit in the Balkan region, by the end of 2008⁴.

In Bulgaria 20% of the poorest households spent more than 14% of their budget on domestic energy services. In 2015, around 67% of the most socially deprived households were still unable to keep their homes warm. This represents a decrease in comparison to previous years, but it remains significantly above the European average of 23% and makes Bulgaria the worst performer in the EU (European Commission, 2017). Also, the percentage of people that do not pay bills (water, energy, heating, etc.) is one of the highest values in Europe⁵. Building renovations should reduce energy poverty by cutting energy bills. This should also reduce the number of households that are unable to pay their utility bills on time due to financial difficulties (Artola, Rademaekers, Williams, & Yearwood, 2016). The phenomenon of unpaid bills is huge in Bulgaria, even if households' electricity prices are considerably below the EU average level. In 2019, the average price for electricity in Bulgaria⁶ was 0.1 €/KWh⁷, while the average in Europe was 0.21€/KWh. The same was true also for gas expenditure, since in Bulgaria gas price was 0.045 €/KWh, while the average in the Union was 0.064 €/KWh (Eurostat, 2019).

In general, the level of information on residential buildings is scarce (Volt, Mariangiola, & de Groote, 2018). There is a lack of information about residential buildings and their energy performance details. No obligation

³ National Statist Institution (NSI) <https://www.nsi.bg/en/content/12362/final-energy-consumption-sectors>

⁴ <https://www-pub.iaea.org/MTCD/Publications/PDF/cnpp2018/countryprofiles/Bulgaria/Bulgaria.htm>

⁵ <https://www.energy-poverty.eu>

⁶ 3 main electricity companies operate in Bulgaria according to the data provided by the National Statist Institution (NSI)

⁷ National Statist Institution (NSI) <https://www.nsi.bg/bg/content/11502>

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exists to collect data about the residential building stock and building owners are not requested to inform the municipality about implemented energy efficiency measures.

- Smolyan Municipality

The Municipality of Smolyan is situated in the South-Centre of Bulgaria on the border with Greece. The area covers a territory of 854 km² in the middle of the Rhodope Mountains. The population of Smolyan is 37.607 inhabitants, of which 28.160 live in the city of Smolyan where the population is decreasing. The Smolyan district is 33 inhabitants per km² (National Census, 2011). The density is one of the lowest in the Bulgarian State due to its territorial configuration. Smolyan City is an important centre for the Region as well as a relevant touristic and environmental site (PadovaFIT EXPANDED D.5.2).

The biggest issue for the city is the underdeveloped infrastructure, both technological and urbanistic. Only 60% of the population has access to internet and 71% to public sewerage. Therefore, Smolyan goal is to enhance the infrastructure system, in particular referring to energy efficiency interventions on private buildings, by taking part in several European projects (PadovaFIT EXPANDED D.5.2).

- Vidin Municipality

Vidin is located in a strategic position in the north-west of the country, surrounded by the Danube river. On the north side, Vidin borders with Romania and with Serbia on the west side. The city embraces an area of 3.032 km². The population is 101.108 inhabitants mostly concentrated on the urban areas of the 11 provinces of Vidin Municipality. The density is 28 inhabitants per square kilometre, the lowest in Bulgaria (National Census, 2011). The population is decreasing, mainly due to the last years of recession that prompted young people to migrate to other regions.

As in Smolyan, most buildings in Vidin was built between 1950 and 1980, even if the trend was constantly increasing until 1980, when it started a slow decline. Again, the majority of the buildings are in a bad status and only 3% is in good condition. Like in the rest of the country the energy poverty is a crucial issue. In Vidin, over 39% of the district's population lives below the national poverty line. In the municipality of Smolyan the percentage is 21% (PadovaFIT EXPANDED D.5.2).

Both Vidin and Smolyan do not have a district heating plant and gas infrastructure. So, the production of heat for the residential buildings is based on woodstoves and biomass stoves for single apartments and biomass boilers for single-family houses. The households use also small electrical heating devices (electric heaters, etc.) to supplement the stoves. The domestic hot water is either boiled on the domestic stoves or through electrical boilers.

- Legislative and regulatory framework

Energy efficiency is a priority for the government, many political instruments and measures are taken to boost energy efficiency in both residential and public buildings.

At the national level, the requirements for minimal values of thermal insulation of buildings have been introduced since 1964⁸, followed by mandatory periodical energy efficiency inspections for heating systems in

⁸ The law fixed the minimum heat transfer coefficient (U, kWh/m²) for residential housing

D.2.2. STRATEGIC ASSESSMENT

private and public buildings. The requirements for minimal values of thermal insulation are applied to all new residential and public buildings by Ordinance n.7/2004. In also, all new buildings in the country constructed after 2020 shall meet the NZEB requirements according to the Bulgarian the Energy Efficiency Act (2015). So far has been developed several pilot programs for public buildings with nearly zero energy consumption (Vassilev & Spassova, 2015).

On December 2019, the Integrated National Plan for the Energy and Climate was presented to the Energy and Climate Committee of the Bulgarian National Assembly. The National Plan is under the public consultation stage and a draft Plan was sent in January 2019 to the European Commission. The Integrated National Plan addresses the development of the internal energy market, the increase of energy security and efficiency, and the country decarbonisation. The expected reduction of primary energy consumption is 27,89% compared to 2007, and the reduction of final energy consumption is 31,67%, compared to 2007. The Plan sets a 27% target for renewable energy in the total energy mix by 2030, now the share achieved is 20.4%. A smooth transition from coal to a greater share of natural gas and biomass should be made after 2030.

At the local level, local authorities of Vidin and Smolyan indicate a high integration level between policies and public instruments. Both cities set an Urban Master Plan incorporating energy efficiency strategy, as well as a Building code which integrates the energy issue for new buildings. The local Building codes require the achievement of Class C as a minimum energy performance standard for existing buildings (built before 2010), and Class B for new buildings built after 2010. Smolyan developed a SEAP for the period 2014-2020 and a new SECAP is under development. Vidin has a municipal Energy Programme, promoting energy efficiency and RES production.

During the socialist period, new housings were built predominantly by the Government with tight limits in size and quality. The political and economic changes after 1989 influenced also the housing sector. All the housing stock, which consists mostly of multi-family buildings, were managed by external associations, with low interest in building maintenance. In 2004 a National Housing Strategy was adopted by the government aiming to stop the process of deterioration of the existing building. According to the new Condominium Law (in force since 2009), homeowners from condominium buildings in Bulgaria are allowed to establish Homeowners Associations (HOA) as legal bodies eligible for access to renovation funds and subsidies (Georgiev, 2015). The Condominium Law obliges Homeowners Associations (HOAs) to maintain their buildings and facilitate large scale energy-efficient renovations. The Law sets this as a voluntary option along with the existing form of Owners Assembly. The supporting legal framework or funding capacity of the public sector to intervene or enforce building management and maintenance is very limited (World Bank, 2017).

- Economic and fiscal measures

Since 2007, the government has implemented several energy-efficiency programs in residential buildings.

Two are the main programs supporting home retrofitting: the NEEP and Regions in Growth. The National Program for Energy Efficiency in Residential Buildings (NEEP)⁹ was the largest housing program in the country and mainly focused on multi-family houses built before 1999. It started in 2012 and ended in 2015. The NEEP was part of Bulgaria's Energy Efficiency strategy aimed to improve the living conditions, help home renovation and address the country's energy and climate challenges. The program was implemented at the

⁹ National Program for Energy Efficiency in Residential Buildings (NEEP) <https://www.mrrb.bg/en/energy-efficiency/energy-renovation-of-bulgarian-homes/>

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municipality level and was financed with National funds, with the Bulgarian Development Bank serving as the intermediary institution (Vassilev & Spassova, 2015). Under the program, financial and technical assistance was provided to HOAs of multifamily buildings registered under the Condominium Law, and which meet other eligibility criteria, to improve energy efficiency of the buildings. HOAs applied to the municipality to participate in the program, and all HOAs that were approved for the program received a 100% grant for the retrofitting works (World Bank, 2017). The Bulgarian Development Bank directly pay the home renovation contractors based on requests by municipalities acting on behalf of the HOAs. The project was implemented in 36 cities, and 158 multifamily buildings were renovated (Vassilev & Spassova, 2015). In Smolyan, around 25 multifamily residential buildings have been renovated by this program. In Vidin 14 residential buildings have been renovated using public funds¹⁰. The full government funding for home renovation has contributed to the rapid success of the NEEP. However, the HOAs establishment did not increase their capacity and motivation to manage and deliver services to their buildings. Another common problem reported by local authorities is the lack of participation of the HOAs in terms of decision-making or supervision or quality control of the works. Also, municipalities were ill-prepared to monitor the quality of construction works. This enforced the lack of trust of homeowners both to HOAs, construction companies (higher prices, cheaper materials, etc.) and local authorities. The 100% subsidy mechanism also raises the issue of equity between citizens.

Those problems and the impossibility to continue with the 100% public grant brought to a change in the financial mechanisms. Bulgaria government is now developing new forms for supporting the home renovation, made by a mix of grants and private budgets. This change now badly affects the home renovation process, due to low-income families and difficulties in accessing credit. New public grant forms are under development, asking the HOAs contribution in order to finance the home renovation. The HOA contribution would be 5% or 10% or 20% of the total project cost (World Bank, 2017).

The second main financial program in the housing sector is the Region in Growth program, financed by the European Structural Fund¹¹. This National Operational Programme focuses on regional development. It also aims to support public investment in social infrastructures (including social housing) and promote social inclusion for vulnerable groups (World Bank, 2017). However, infrastructure upgrading in marginalized areas and ethnic minority groups are not supported by this program. The National Roma Integration Strategy 2012-2020 was developed with the aim of improving housing conditions in Roma neighbourhoods including infrastructure upgrading. However, it is unclear how much funding is set aside for this purpose.

Local authorities reported another financial program: The Renewable Energy, Energy Efficiency and Energy Security Program, funded by the European Economic Area Financial Mechanism 2014-2021¹². The main objective is to reduce carbon intensity and increase the security of supply. It will be achieved by increasing the production of energy from renewable sources, improving energy efficiency in buildings, industry and municipalities, as well as increasing the expertise in the field of renewable energy and energy efficiency.

Volumetric incentive and construction right rebates are not available at the local level. The majority of home renovation activities are supported by public grants and since few years by fiscal rebates and Energy services

¹⁰ National Program for Energy Efficiency in Multi-Family Residential Buildings (Vidin and Smolyan)
<https://www.mrrb.bg/en/energy-efficiency/energy-efficiency-of-multi-family-residential-buildings-national-programme/>

¹¹ https://www.euro-access.eu/programm/regions_in_growth_bulgaria

¹² <https://www.nve.no/international-cooperation/bulgaria-program-on-renewable-energy-energy-efficiency-and-energy-security-funded-by-eea-grants/>

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companies, like ESCOs, which are increasing in relevance. Reduced interest loans are also not available for home renovation works. This represents a huge problem, especially for low-income families. Few banks offer products for people with low incomes and require them to pay higher interest rates due to their higher risk profile (World Bank, 2017).

Table 11 Public financial measures in Bulgaria for residential and commercial buildings

Measures	Type	Beneficiaries	Level
The National Program for Energy Efficiency in Residential Buildings (NEEP)	Public grant covering 100% grant for the retrofiting works. In force till 2017	Homeowners Associations (HOAs)	National
Region in Growth program	Public grant	Homeowners Associations (HOAs), Social Housing, Local authorities	National
National Roma Integration Strategy 2012-2020	Public grant	Roma communities, Local authorities	National
The Renewable Energy, Energy Efficiency and Energy Security Program	Public grant	Homeowners Associations (HOAs), Industrial sector, Local authorities	National
Fiscal rebates	Fiscal rebates	Taxpayers, Homeowners	National

3.3.2. INDIRECT INFLUENCE FACTORS

- Political factors with an indirect influence on the home renovation marketplace

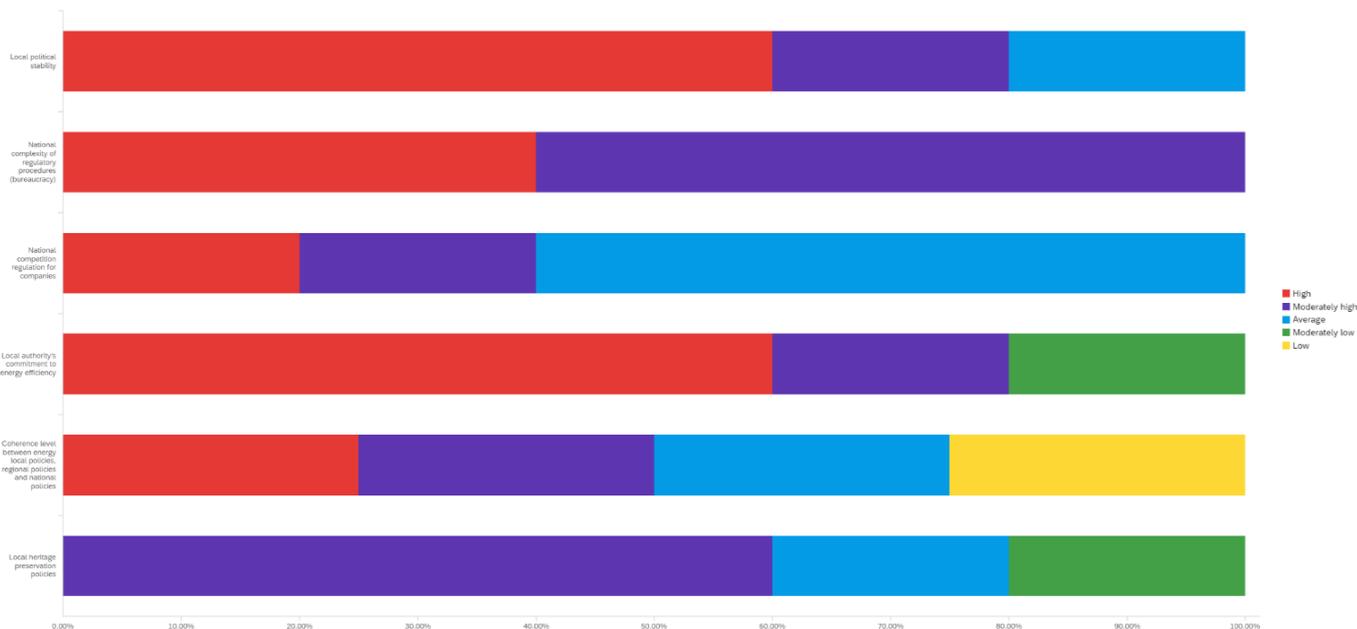


Figure 25 Share of Political factors relevance. In red high relevance, Moderate-high relevance in purple, Average in light blue, Moderate-low relevance in green and in yellow the low relevance.

According to local actors, the main political factors which indirectly influence the home renovation market are: the “Local political stability” (60% of preference), the “Local authority commitment” (60%) which is increasing in both National and Local level with many EU projects ongoing in the field of energy efficiency, and “The national complexity of regulation procedures” (40% in the field of high impact and 60% in the moderate-high field). Many respondents report difficulties for homeowners in preparing application documents, due to institutional barriers, like conflicting guidelines, and lack of public bodies coordination. The “Local heritage preservation policies” factor also has a moderate-high impact (60% of preference in the moderate-high field), as well as the “National competition regulation for companies”. In general, seem that all the political factors can have a high influence on the marketplace.

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- Economic factors with an indirect influence on the home renovation marketplace

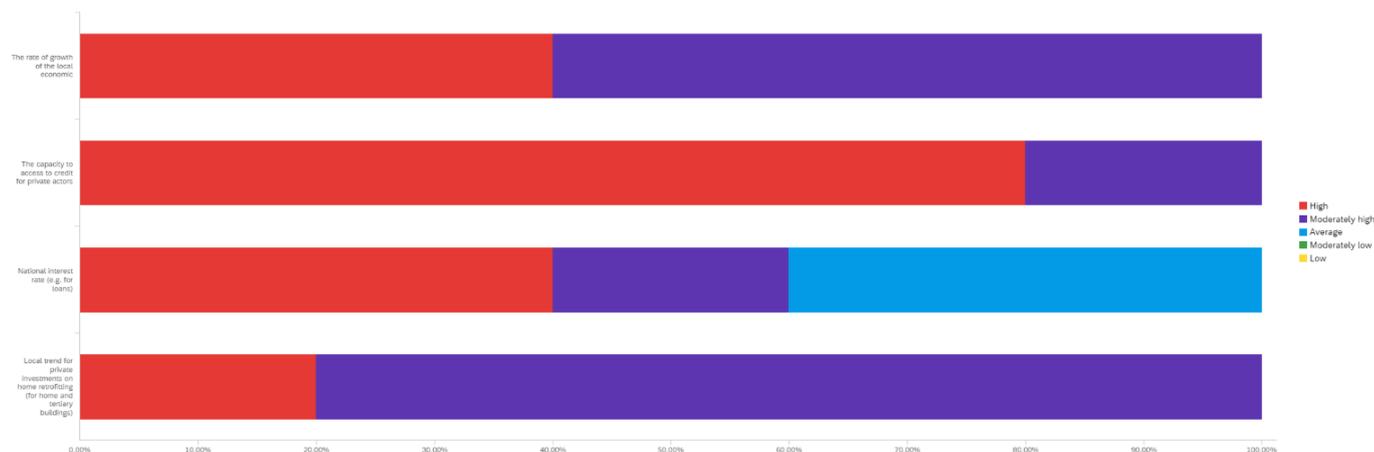


Figure 26 Share of Economic factors relevance. In red high relevance, Moderate-high relevance in purple, Average in light blue, Moderate-low relevance in green and in yellow the low relevance.

The “Rate of growth of the local economy” is a high impact factor in Bulgaria. Since 2008, poverty rates have risen, and income gains have slowed. Real GDP growth is expected to slow significantly to 2,9% in 2020 and 3,1% in 2021 due to weaker domestic demand growth (European Commission & Directorate-General for Economic and Financial Affairs, 2020). A large proportion of population is either unable to afford basic home maintenance or has little incentive to do so (World Bank, 2017). This situation is particularly severe for Roma families and other ethnic minorities. For this reason, the “Capacity to access to credit” is seen as the main impacting factor with 80% of preference in the online survey. Linked to this factor, the “National interest rate for loans” shows high potential in influencing the home renovation market. In Bulgaria, reduced interest loans are not available, and few banks offer products for people with low income. The home renovation financial mechanism based on 100% public fund, limited the evolution of other soft financing tools. The current changing in financing procedures may stop the renovation process, especially without specific policies focus on reducing the interest rate and improve access to credit. Economic policies and instrument are extremely necessary in this phase in order to support private homeowners and HOAs.

D.2.2. STRATEGIC ASSESSMENT

- Social factors with an indirect influence on the home renovation marketplace

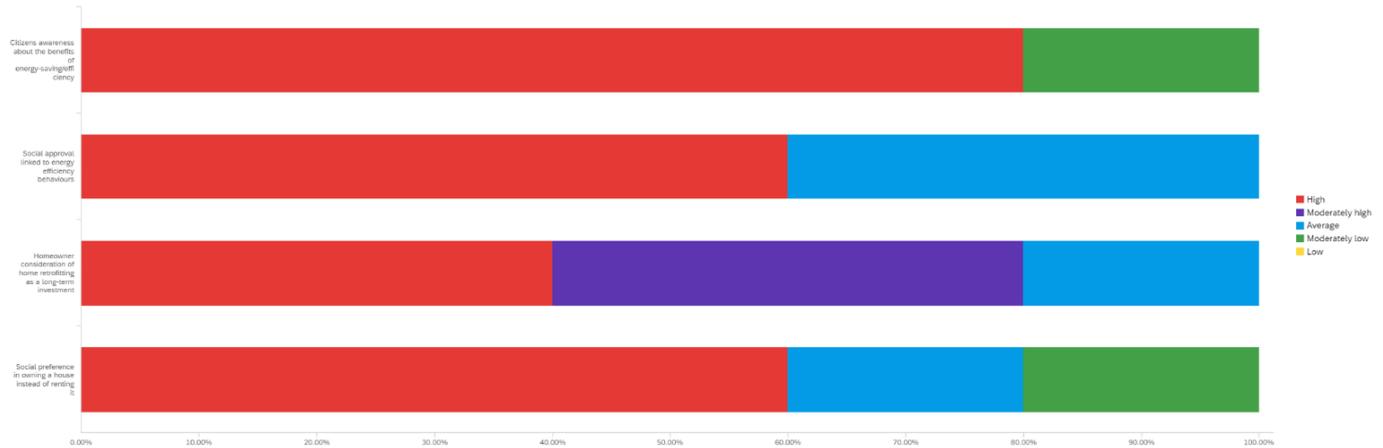


Figure 27 Share of Social factors relevance. In red high relevance, Moderate-high relevance in purple, Average in light blue, Moderate-low relevance in green and in yellow the low relevance.

The results show some contradictions. In general, all factors show high indirect impact. The main three factors are: the “Citizens awareness about the benefits of energy-saving” (80% of preference), followed by the “Social approval linked to energy efficiency behaviours” (60%) and the “Social preference in owning a house” (60%). The last one is confirmed by the literature (Georgiev, 2015; World Bank, 2017) which reports a high share of privately owned housing plus a deeply rooted aspiration for possessing their own dwelling. According to literature and respondents, homeowners are not aware of the benefits linked to energy efficiency interventions both in terms of increasing comfort and property value. For this reason, the “Homeowners consideration of home retrofitting as a long-term investment” is seen as a moderate-high impact factor for the home renovation process (40% of preference). However, the main social barrier is the homeowners' lack of trust to Homeowners Associations (HOAs), local authorities and construction companies. The HOAs many times did not supply the services required and in case of home renovation interventions they did not supervise the quality of works (Volt, Mariangiola, & de Groote, 2018). This element is crucial for the success of the OSS.

The respondents also point out the lack of consensus among homeowners to participate in home renovation in multi-family buildings, due for the high vacancies rate, and the lack of guarantees/compensation in case of poor-quality work. Those factors badly affect the social interest in starting or investing in home renovation and energy efficiency improvements.

D.2.2. STRATEGIC ASSESSMENT

- Technological factors with an indirect influence on the home renovation marketplace

Technological factors	High	Moderately high	Moderately low	Low
Vehicle to grid technology	0%	8%	25%	67%
Energy storage systems (e.g. home or grid-scale batteries; thermal storage)	0%	0%	23%	61%
Geothermal heat pumps	0%	0%	23%	54%
Electric vehicles	0%	0%	38%	54%
Cogeneration systems or combined heat, cooling and power (CHP)	8%	0%	38%	46%
Heat pumps (air to air and water heat pumps)	23%	31%	0%	31%
Condensing boilers	8%	17%	25%	25%
Biomass systems	7%	31%	38%	15%
Solar electric, or photovoltaic (PV), systems	7%	15%	38%	15%
Solar thermal, including solar hot water and space heating	0%	31%	23%	15%
District heating/cooling systems	38%	0%	31%	15%

Table 12 Diffusion rate of technologies. Bold values indicate the most interesting results.

The diffusion rate of new technologies is moderate-low in Bulgaria. Even if different policies and programs have been developed in the last decade, the technology systems still have low diffusion. This is particularly evident for energy storage systems, and geothermal heat pumps. Also condensing boilers and cogeneration systems have a low diffusion in Bulgaria. The production of heat for the residential buildings is based on woodstoves and biomass stoves for single apartments and biomass boilers for single-family houses. The households use also small electrical heating devices (electric heaters, etc.) to supplement the stoves. Electric vehicles and the Vehicle to Grid technologies are low common. The two technology systems with a high diffusion are the heat pumps and biomass systems, mainly used for the private home heating also in Smolyan and Vidin, followed by PV panels and solar thermal systems. The District heating systems have a high presence in Bulgaria, but not in the two target cities, see PadovaFIT EXPANDED D5.2.

3.3.3. DIRECT INFLUENCE FACTORS

- Regulatory measures

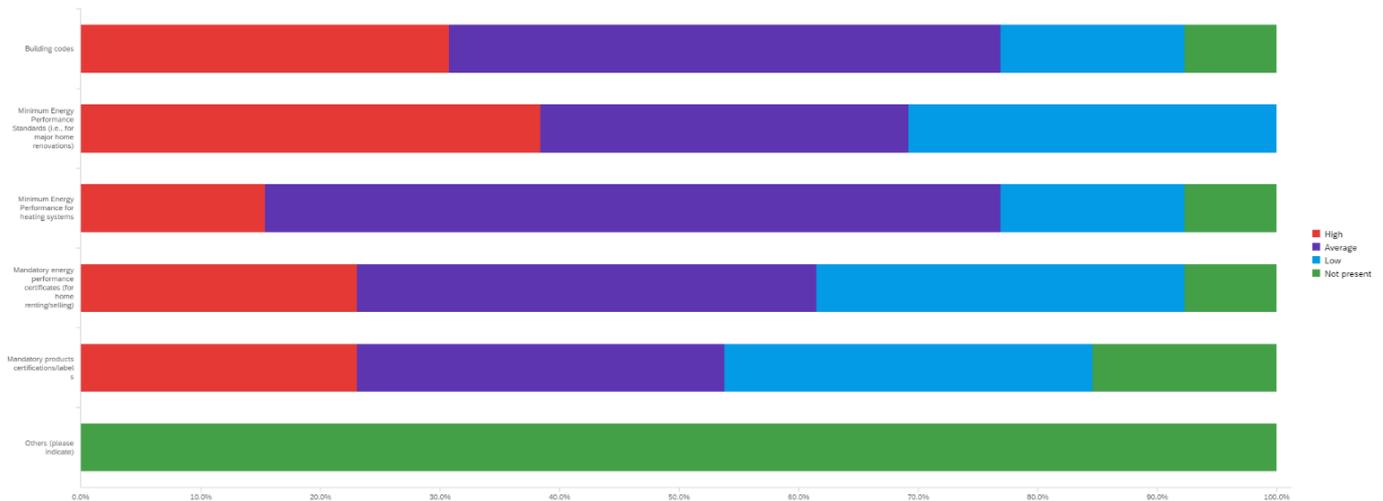


Figure 28 Regulatory measures relevance in affecting homeowners' behaviours. In red high relevance, Moderate-high relevance in purple, Average in light blue, Moderate-low relevance in green and in yellow the low relevance.

The “Mandatory (min) energy performance standard for new buildings, and major renovation” is the most useful regulatory instrument to foster behaviour change, according to respondents (38% of preference). The “Mandatory (min) energy performance for heating systems” has also a moderate-high impact on homeowners’ behaviours, followed by “Certification/Labels for products/services” and “EPC mandatory for selling and renting a home”. Behaviour change is also highly affected by “Building code” (31% of preference in the high relevance field).

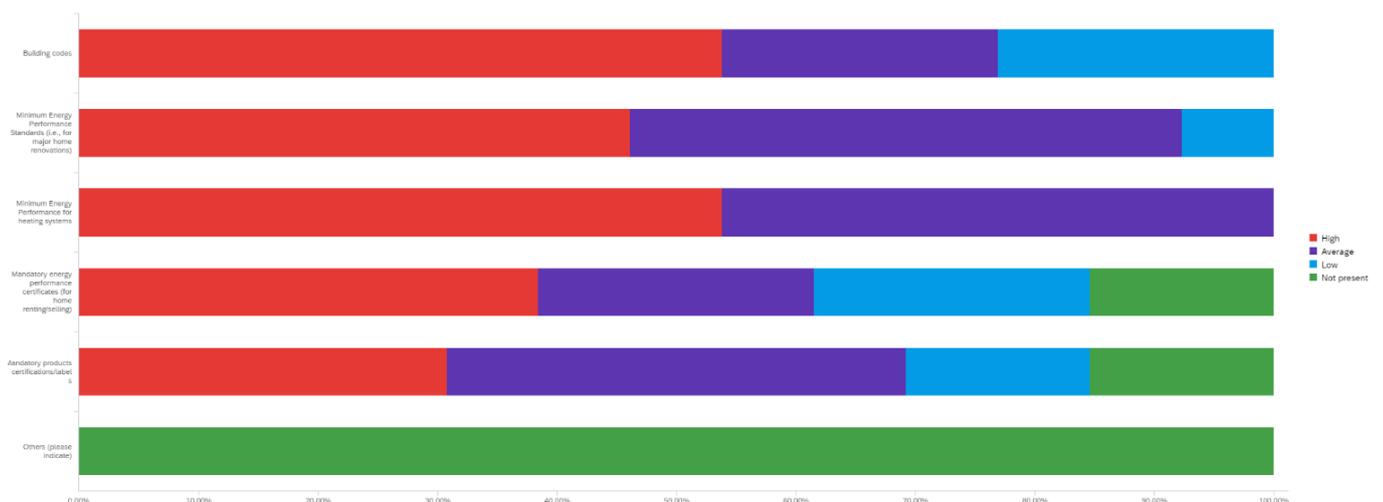


Figure 29 Regulatory measures relevance in boosting home energy efficiency. In red high relevance, Moderate-high relevance in purple, Average in light blue, Moderate-low relevance in green and in yellow the low relevance.

D.2.2. STRATEGIC ASSESSMENT

All the regulatory measures have a moderate-high impact on boosting energy efficiency in the building sector, especially the “Mandatory (min) energy performance for heating systems” (59% of preference in the high relevance field) and the “Mandatory (min) energy performance standard for new buildings, and major renovation” (46% of preference in the high relevance field). These two measures are well rooted in the Bulgarian regulatory framework which means high acceptance and awareness for homeowners. The “EPC mandatory for selling and renting a home” has also a moderate-high impact on energy efficiency improvement. The “Building code” seems to have a high impact, according to respondents, even if it focuses only on new constructions and it does not have a direct influence on home renovation for existing housing. The questionnaire results show a moderate-high presence of information barriers, due to difficulties in accessing information for homeowners and private actors. Respondents agreed that the OSS should deliver information services (85% of preference) in order to facilitate the acquisition of minimum energetic standards both for housing and industry sector.

- Public incentives and subsidies

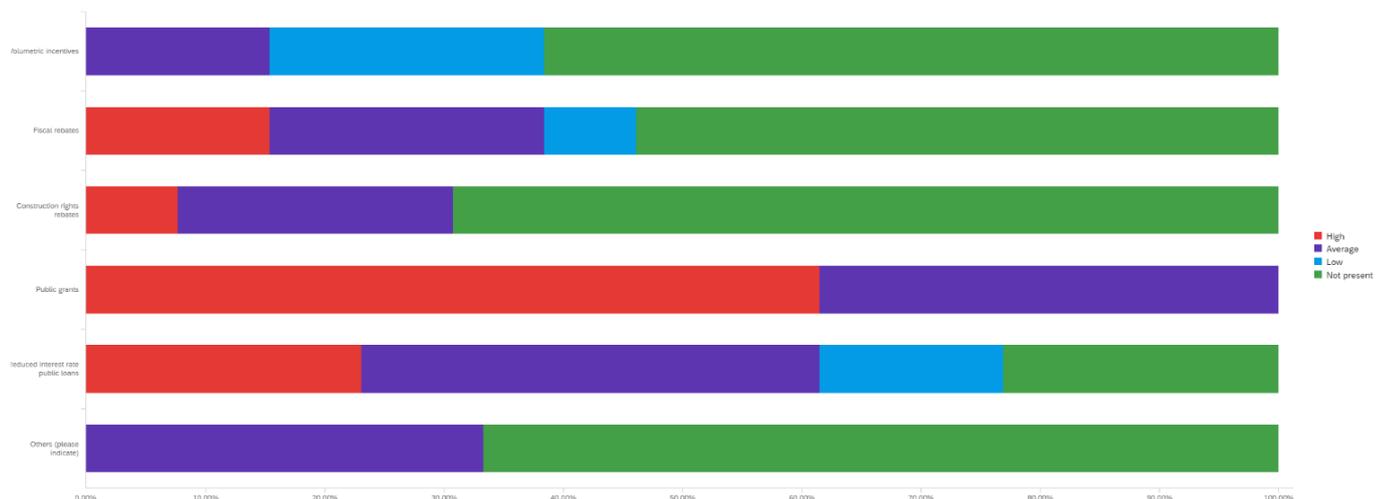


Figure 30 Public incentives relevance in affecting homeowners' behaviours. In red high relevance, Moderate-high relevance in purple, Average in light blue, Moderate-low relevance in green and in yellow the low relevance.

D.2.2. STRATEGIC ASSESSMENT

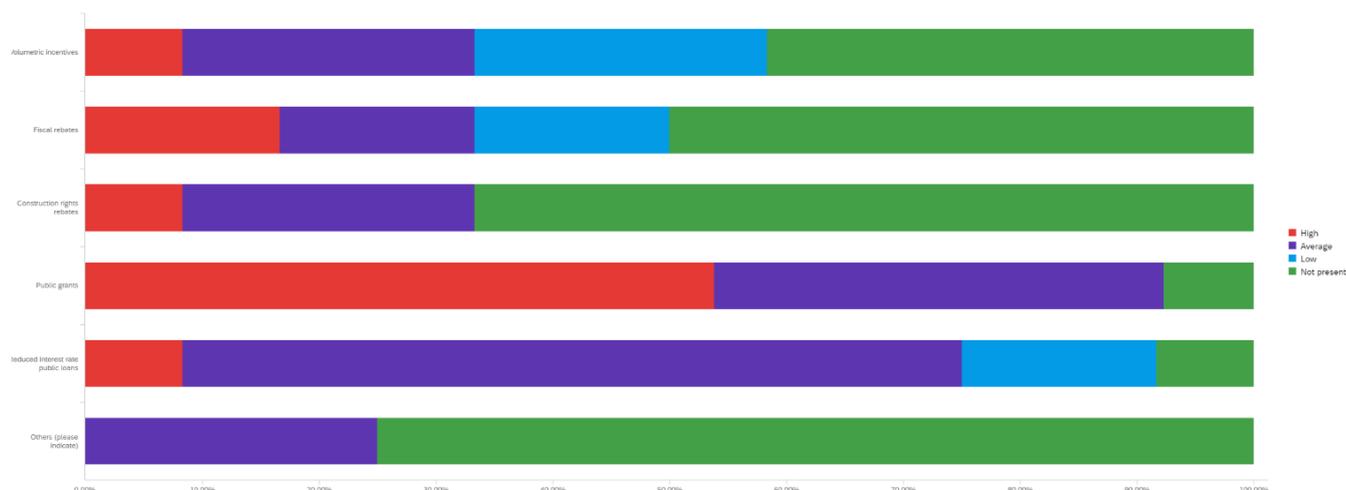


Figure 31 Public incentives relevance in boosting home energy efficiency. In red high relevance, Moderate-high relevance in purple, Average in light blue, Moderate-low relevance in green and in yellow the low relevance.

From the questionnaire emerges a wide similarity between factors with a direct impact on people behaviours and energy efficiency improvement in the building sector. “Public grants and funds” are the main financial instruments in Bulgaria. Among new financing mechanism the “Fiscal rebates” and the “Reduced interest rate public loans” are the most interesting instruments, according to the questionnaire results. The first one is already available, but many problems persist. Indeed, in some case, the taxes on properties are even higher after the renovation of the building (World Bank, 2017). The incentives framework is not yet well set up by the Government. A transition period is necessary at this stage. Respondents point out difficulties in accessing information related to public financing mechanisms. This includes a general low understanding of financing programs within homeowners and difficulties in preparing application documents. According to respondents, the main role for the OSS is to provide information and support in understanding public incentives and subsidies (93% of preference).

- Technical instruments

Question	High	Average	Low	Not present
Windows replacement and insulation	100%	0%	0%	0%
Walls insulation	93%	7%	0%	0%
Roof insulation	78%	14%	7%	0%
Facade renovation (multi-family housing)	78%	14%	7%	0%
Energy audit	21%	28%	50%	0%
Heat and cooling system replacement	21%	43%	21%	14%
Integrated interventions	14%	42%	35%	7%
Home automation	0%	28%	35%	35%
RES plants installation	0%	28%	50%	21%
Others (please indicate)	0%	0%	0%	100%

Table 13 Technical instruments relevance in affecting homeowners’ behaviours. Bold values indicate the most interesting results.

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Although in Bulgaria, building owners do not tend to declare when they renovate home or implement energy efficiency measures, the questionnaire shows interesting results in terms of impact and diffusion of technical instruments. The most useful and impacting technical instruments both for fostering behaviours change and energy efficiency improvements are: “Windows replacement and insulation” (100% high relevance in affecting behaviours and 85% high relevance in boosting EE), “Walls and roofs insulation” (93% high relevance in affecting behaviours and 85% high relevance in boosting EE), “Façade renovation for multi-family housing” (78% high relevance in affecting behaviours and 71% high relevance in boosting EE), and “Heat and cooling systems replacement” (21% high relevance in affecting behaviours and 50% high relevance in boosting EE).

Question	High	Average	Low	Not present
Energy audit	28%	42%	28%	0%
Windows replacement and insulation	85%	14%	0%	0%
Walls insulation	85%	7%	7%	0%
Roof insulation	85%	7%	7%	0%
Facade renovation (multi-family housing)	71%	21%	7%	0%
Heat and cooling system replacement	50%	28%	14%	7%
Home automation	21%	14%	50%	14%
Integrated interventions	43%	21%	35%	0%
Others (please indicate)	0%	0%	0%	100%

Table 14 Technical instruments relevance in boosting home energy efficiency. Bold values indicate the most interesting results.

Those interventions are in line with the results emerged for Padova and Timisoara, see section 3.1.3 and 3.2.3. An interesting result concerns the “Energy audit” (21% high relevance in affecting behaviours and 28% high relevance in boosting EE). Although the energy audit is recognised by respondents as a high impact factor for both homeowners’ behaviours change and energy efficacy improvements, it is low appreciated by homeowners, due to a general distrust in energy advice tools. The responses show a low influence level related to “Home automation”, “RES plants installation” and “Integrated interventions”. The low attractiveness of integrated interventions is another interesting result. The low structural quality of Bulgarian housing stock suggests the need for both energy improvement and structural renovation. Integrated renovation projects are crucial for restoring the quality of Bulgarian buildings and reduce safety risks for households.

The questionnaire results show high difficulties in reaching technical instruments information. Homeowners are not aware of the benefits coming from different energy efficiency interventions. The decision on which technical measure implement depends mainly on economic issues. The lack of trust in companies supplying technical services and the presence of low-skilled workers decrease the attractiveness of home renovation. In the last years, the ESCOs increase in significance, limiting the risk of low-quality interventions (World Bank, 2017). This is especially valuable if innovative technologies are implemented and specialist skills are necessary for operation and maintenance. The respondents agreed that the OSS should provide support in reaching information (92% of preference), and act as an ESCO providing technical services with quality assurance (78% of preference).

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- Finance instruments

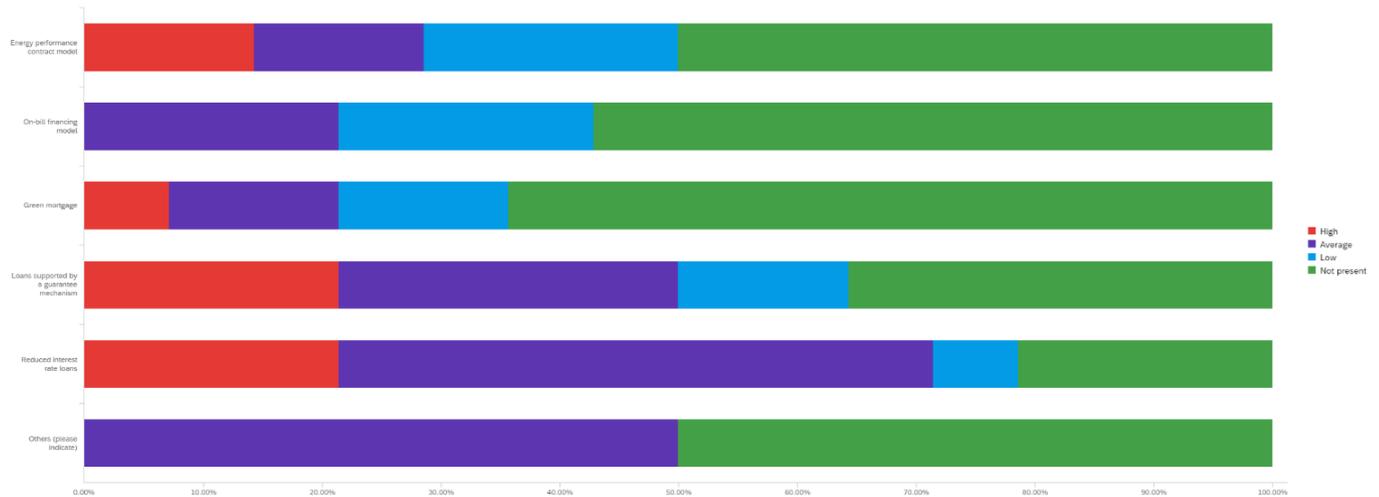


Figure 32 Finance instruments relevance in affecting homeowners' behaviours. In red high relevance, Moderate-high relevance in purple, Average in light blue, Moderate-low relevance in green and in yellow the low relevance.

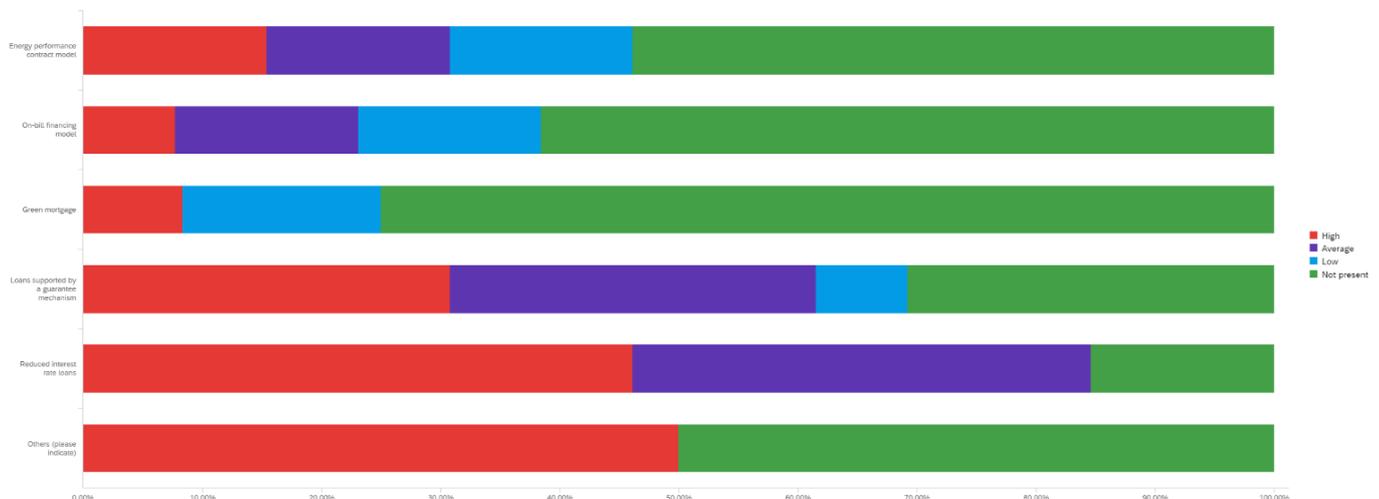


Figure 33 Finance instruments relevance in boosting home energy efficiency. In red high relevance, Moderate-high relevance in purple, Average in light blue, Moderate-low relevance in green and in yellow the low relevance.

The 100% public grant in force until 2017 brings to a general apathy resulting from a sense of entitlement that the State will take care and pay for home quality improvement (World Bank, 2017). This has hindered the establishment of innovative finance instruments. The questionnaire results confirm this tendency. The main two financial instruments to foster behaviours change and boost home energy efficiency are: “Loans supported by a guarantee mechanism” (23,43% high relevance in affecting behaviours and 31% high relevance in boosting EE) and “Reduced interest rate loans” (21% high relevance in affecting behaviours and 46% high relevance in boosting EE). Although these two instruments are recognized as the most impacting, many problems limit their functionality. Few banks offer products for people with low incomes due to their

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higher risk profile. The public guarantee can reduce the risk perceived by banks and private investors. The “Energy performance contract model” and the “On-bill financing model” can have a high impact on improving energy efficiency but they are low attractive for homeowners. This because they are less common and known in Bulgaria. “Green mortgage” have low penetration in Bulgaria and a low impact according to respondents. The reduced financial capacity of the State brings to the need for implementing new private financial mechanisms.

Raise awareness campaigns are crucial for the establishment and success of those instruments. Respondents agreed that the OSS can drive this change and increase the implementation of innovative private finance instruments, providing information and support to homeowners. Respondents point out that the OSS should not directly provide finance instruments (50% of respondents).

- The real estate market

The building energy performance is not an influencing aspect of buying a house in Bulgaria. Price, location, and comfort are more significant aspects (Volt et al, 2018). However, the energy efficiency aspect is growing in relevance in the last years, especially for higher-income groups and in urban areas, where the housing demand is increasing (World Bank, 2017). The survey asked local actors to rate the relevance of the EPC (building Energy Performance Certification) in increasing the value of properties. The questionnaire results show a moderate-high potential in increasing housing value both for renting (21%) and selling (28%). The EPC is not mandatory in Bulgaria, and this decreases the significance of the instrument. In also, it is showed rarely in advertisements for selling and renting properties (50% of respondents).

3.3.4. MARKET SEGMENTATION AND LOCAL PLAYERS

The online questionnaire asks to categorize a list of local and national actors within the home renovation chain, identifying potential OSS customers, Suppliers, Partners, Financiers, and Competitors. The results (Figure 19) show a high presence of potential OSS partners in the two target cities. A partner can be a local actor or organization interested in starting common businesses with the OSS. The main partners identified by respondents are Architect and Engineering firms, Professional boards, Building managers and Homeowners associations (HOAs), Foundations and ONG in general, Utilities and Energy companies. Management companies are increasing in significance, but they are unregulated/unlicensed and hesitate to service older buildings given the complexity of the underlying maintenance issues and disorganization of the residents (World Bank, 2017).

There are a few potential competitors, according to respondents. ESCOs and Energy desks are not common in Bulgaria, consultant services in the field of home renovation are mainly provided by Regional and National agencies and Architect/Engineering firms.

Home renovation services suppliers can be Manufacturers (technology providers, e.g. photovoltaic panels, heat pumps, etc.), Utilities (Public-Private companies employed in energy production and supply), Software providers, Energy companies, Construction companies, Building developers and ESCOs.

Potential OSS financiers can be Financial operators, mainly Bank institutions, ESCOs, Energy companies, Foundations (interested, or already involved in home renovation projects) and Non-profit associations (interested, or already involved in home renovation projects). The recent change in the home renovation

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financing mechanism opens new possibilities for the establishment of innovative businesses in a marketplace with few direct competitors and high request for home refurbishing works.

There are many and different potential OSS costumers: Private homeowners, Homeowners associations, Building managers, Building developers and Building construction companies. Architect and Engineering firms, as well as Professional boards, are not seen as potential OSS costumers by the respondents.

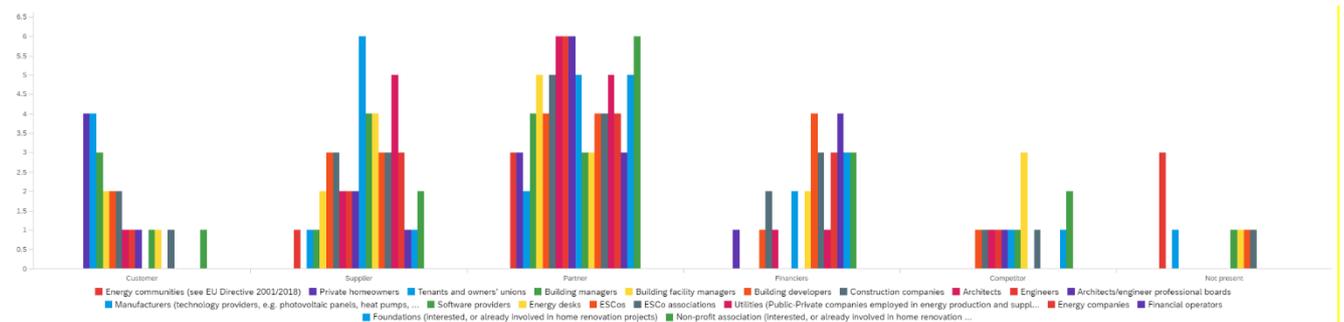


Figure 34 Local market segmentation and potential players in the home renovation

The questionnaire also asks to rate the interest level in the OSS services. Results show a general high interest of actors involved in the home renovation chain, especially related to potential customers. Private homeowners, Homeowners associations (HOAs) and Building managers have a higher level of interest, followed by Energy companies, Building developers and Construction companies. The lowest interest is linked to Utilities and Software providers.

The high demand for structural and energetic home renovation works, the homeowners' distrust to suppliers and market operators, and the need for new financial forms create a favourable condition for the OSS establishment. The OSS can overcome information barriers by providing easy access to information and reduce the lack of trust giving support in the process of contractors' selection

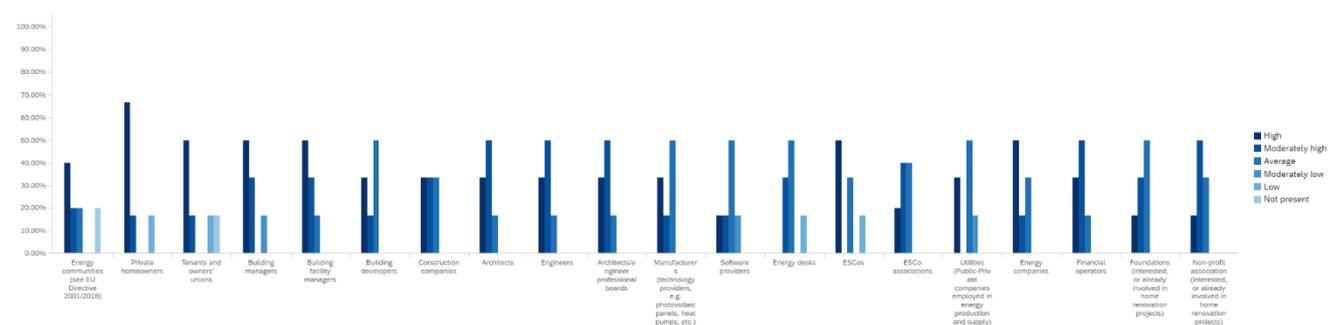


Figure 35 Local costumers and players potential interest in the OSS services

3.4. OSS Internal factor analysis

Internal factors have a direct impact on the business of an enterprise, and they refer to variables such as the internal organization, the quality of human resources, the physical resources and technological capabilities, the financial stability, the revenue stream and fee types, the operational costs of the business, the external network. Those represent key factors for the implementation of the OSS. Thus, it is important to understand how they would affect the future OSS business model.

The internal factors analysis aims to identify the most successful solutions experimented by OSS initiatives. Partners organised a building capacity session with 5 innovative OSS initiatives operating in Europe (Section 2, Table 2). It permitted to collect information on the OSS functioning, internal organization, and services delivered. The initiatives show many differences in terms of organization structure, scope, business plan, legal form etc. However, a set of recurring internal factors have been identified.

Internal factors depend on the OSS legal form, the budgeting and the services delivered.

The legal form refers to the types of business entities, which is defined in the legal systems of various countries. In general, many types of business entities exist like corporations, cooperatives, Public-Private partnerships or semi-public entities, sole traders, limited liability companies and other specifically permitted and labelled types of entities. The legal form directly impacts the OSS functioning, financial stability, revenue stream, etc. For instance, two of the OSS initiatives involved in the capacity building session were non-profit public organizations (Modena Energy Agency, and Riga Energy Agency). These supply services with the full support of public funds without proper revenues for the OSS. In these cases, the main operating costs are staff costs, subcontracted staff costs, and dissemination events costs.

The budgeting refers to the process by which a business estimates its finances for a future period and plans its operations accordingly. Budgets are an integral part of running a business efficiently. It is linked to the legal form. For public OSS or Private-Public partnership OSS the budget mainly comes from public funds (European, National, or Local funds). In many cases (Hola Domus, SuperHome, and Hauts-de-France Pass Rénovation), the budget is a mix between own budgets, public subsidies, public funds, and credit institution loans.

In PadovaFIT EXPANDED D.2.1 has been developed a categorization of OSS initiatives according to the services provided: marketing and communication, technical and financial advice, coordination of suppliers or contractors, financial and technical product supplying. Different type of services provided by the OSS, directly affect the type of business entity in terms of human resources, technological capabilities, revenue stream and fee types, operational costs, and external partnerships.

- The OSS with a “facilitation” model aims to raise awareness to homeowners, by providing light support in the form of free of charge advice, either at a physical office and/or online. It asks for moderate costs to be set up, and the operational costs are covered by the program authority.
- In the “coordination” model, the OSS coordinates various market players, which act as contractors, paying the OSS a fee for the publicity, new market potential and other benefits they get by being part of this scheme. In this case, the operational costs are moderate-low. There is no need of many human resources because the final services are provided by high qualified external contractors, such as energy consultants, suppliers and banks or other financial institutions.

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- The OSS adopting the “development” model provides high support to customers. Indeed, it is the OSS itself that signs contracts with homeowners and offer them an integrated energy efficiency service package under its own name and responsibility. It can develop its own financing scheme, and then gets paid back by the homeowner via a service fee or loan instalments. Human resources, technological capabilities and financial capacity become key elements to deliver high-quality services.

Starting from this information background the Internal factors analysis shows the most successful solutions developed by 5 OSS initiatives in Europe: Hola Domus in Spain, SuperHome in Ireland, Hauts-de-France Pass Rénovation in France, Lemon project in Italy, Energy Agency of Riga.

The analysis is structured in 3 sections: 1) OSS internal organization (human resources, physical resources and technological capabilities); 2) OSS financial scheme (budgeting, revenue stream and fee types, operational costs); 3) OSS external network and partnership.

3.4.1. OSS INTERNAL ORGANIZATION

The OSS initiatives analysed are characterized by multi-disciplinary teams, with technical experts (mainly engineers), project managers and financial consultants. The majority of the OSS experimented the importance of employing experts in communication, community engagement and process facilitation. The home renovation is not only a technical and economic process. In order to encourage homeowners in starting a home renovation, the communication and convincing activities are crucial, especially in multi-family housing, where conflicts between owners widely limit the renovation works execution. Technical skills and technological capabilities are often provided by subcontractors and external partners in a cooperative manner, where several market actors with complementary competencies join together to plan and execute the renovation project.

The physical resources are not considered as crucial factors. The customer engagement is processed by websites and public seminars, the consulting activities by in loco visits, as well as the monitoring and supervision activities. Almost all the OSS analysed have small offices, but the cost related are moderate-low. All the OSS use digital tools to guide the renovation work, like energy audit tools, diagnostic tools, management tools. Those tools are useful to recommend the best measures to be implemented for the renovation while taking into account the customer's needs and preferences. The initial costs for purchasing the license of tools and for hiring experts could be high.

3.4.2. OSS FINANCIAL SCHEME

All the OSS examined were set-up by public funds: European and National funds for Lemon project and Hola Domus (EroPACE project); National and Regional funds for SuperHome, Hauts-de-France Pass Rénovation and the OSS developed by the Energy Agency of Riga. The OSS concept is not well developed in any country, and such initiatives are welcomed by all national authorities which aim to address the climate challenge. Companies and local authorities involved in the development of an OSS have many opportunities to receive grants to cover part of the development costs.

Except for the Energy Agency of Riga which is a no-profit OSS, all the other initiatives receive a fee for their services. The fees are in many cases paid by contractors and suppliers, except for the Lemon project which receives a fixed fee (5% of the costs) from building managers for the management and monitoring services provided. SuperHome receives a direct fee from homeowners for the energy audit service and the consulting

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services. It also receives a project management fee from the Government. Hauts-de-France Pass Rénovation provide direct loans to homeowners and condominium with an interest rate around 2,5%.

Considering the home renovation investments, they are provided by a mix of financial forms in all cases. The most used mechanism to finance the home renovation is the co-financing:

- Energy Agency of Riga provides 50% co-financing for home renovation projects and 80% co-financing for energy audits. The remaining costs are covered by homeowners, or banks when a loan has been requested,
- Hauts-de-France Pass Rénovation provides a mix of financial forms, composed by OSS' own budget (70%), European and National grants (13%) and homeowners self-financing (17%) depending on the type of renovation. Not all applications are accepted. Before to grant the loan, the OSS analyses the homeowners' capacity to repay the debt in collaboration with the local authorities and bank institutions,
- Lemon project provides two financial packages: 1) homeowners self-financing and National fiscal rebates, 2) third-party financing (Energy Performance Contracts) provided by ESCOs. The home renovation projects co-financiers are homeowners, banks, ESCOs, public bodies.
- Hola Domus provides direct loans with government guarantee (20% of the loan is covered by the Social Guarantee Fund established by the local authority and managed by EuroPACE Foundation), plus personalized financing packages incorporating subsidies, tax credits and other incentives. The public nature of the agreement between GNE Finance and the local authority ensures tax rebates,
- SuperHome provides advice to access public grants and subsidies. The renovation costs are covered by public grants, financial institutions, and homeowners self-financing.

The main operation costs emerged from the OSS initiatives are the staff costs, the subcontract staff costs, the communication costs (advertisements, newsletters, website development and maintenance), the dissemination costs (community events, seminars), the insurance costs. The operation costs are covered in all the cases by public subsidies and funds.

3.4.3. OSS EXTERNAL NETWORK AND PARTNERSHIP

The external partnership and network are key elements for the OSS functioning in all initiatives analysed. Except for the OSS established in Riga, the other initiatives act as a contractors' cluster cooperation, where usually small and medium enterprises join together with a very informal structure. This model ensures control over costs and guaranteed performance, given that each actor specializes in a specific aspect of the project, and also lowers the vulnerability compared to isolated actors. In this model, the whole value chain of players of the renovation sector is involved collaboratively – from architects and designers to material and equipment suppliers, from capital providers to engineers and developers.

All the OSS initiatives do not directly provide technical works, they developed a network list of validated construction companies, products suppliers, architects and engineer firms to involve in the home renovation works. In case of multi-family housing renovation, the OSS launches a call for tenders setting-up specific quality requirements. The quality assurance is important in every renovation. Customers need to be sure that all the actors involved in the project can be trusted and that the quality of work and service meets some basic

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requirements. The OSS act as a coordinator, supervising the achievement of energy saving and the quality of works. At the end of the projects, almost all the OSS initiatives provide monitoring activities. Almost all the OSS initiatives also provide training courses for contractors and suppliers.

Another critical issue is how to distribute responsibility and payment terms among the partners involved in the work. As legislation differs from country to country, it is wise to obtain legal advice before starting up. Some of the issues to address include the warranty, product liability, product declarations, responsibility for work executed by others, etc. From a legal point of view, there are mainly four levels for a regulation governing construction: 1) The homeowner, 2) The architect and/or the project manager, 3) The main contractor, 4) The subcontractors. The legal systems governing the rights and responsibility of the parties are quite similar throughout Europe, though there can be slight differences between countries (Haavik et al, 2011). The legislation will reflect the parties' rights and responsibilities. If one chooses to be a project manager instead of the main contractor, one can design the contract to transfer liability during the building process from the project manager to the sub-contractors, if that is allowed by the national legislation. After the building process, the responsibilities are much the same. In any case, good contract competency and written frameworks should be developed with the help of skilled lawyers.

4. CONCLUSION

The strategic assessment aimed to collect and analyse contextual information useful to understand the socio-economic, political and technical situation in the target areas. It is carried on by UB on the Padova area and the follower areas, Timisoara (RO), Vidin and Smolyan (BG).

The strategic assessment is based on the analysis of three complementary macro-factors influencing the implementation and operability of the OSS. The macro-factors are categorized into three main groups: 1) Factors with an indirect influence on the marketplace, 2) Factors with a direct influence on the marketplace, and 3) Internal factors.

The analysis on indirect factors is assessed by conducting a PEST analysis, taking into consideration the Political, Economic, Social and Technological factors that influence the marketplace and, therefore, indirectly impact the activity of the OSS.

The analysis on direct factors focuses on local regulation framework, public incentives and subsidies, technical and financial instruments, real estate market conditions and finally market customers and players.

The two analyses have been conducted through an on-line survey, submitted to local actors involved in the home renovation chain. The questionnaire submission produced 40 responses: 6 from Padova (IT), 20 from Timisoara (RO) and 14 for Vidin (BG) and Smolyan (BG).

The analysis of OSS internal factors aims to identify possible key factors for the establishment of the business, such as the quality of human resources, the physical resources and technological capabilities, the financial stability, the revenue stream and fee types, the operational costs of the business, the external network. It has been conducted through an online capacity building session, organised in accordance with project partners and lead by Climate Alliance. The meeting involved 5 innovative OSS initiatives operating in Europe.

The results give a complete overview of all crucial factors affecting the future OSS business models in each target area. It contributes to defining the current framework in which the OSSs are going to operate and is crucial for identifying strengths, weakness, opportunity and threats of the OSS in each target areas.

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The results show some similarities between the four target areas, according to respondents.

The most relevant Political factors are the “Local authority’s commitment to energy efficiency” in all four target areas, followed by the “National complexity of regulatory procedures”. The “Local political stability” has a strong impact mainly in Bulgaria and Romania. The most relevant Economic factors are “The capacity to access credit for private actors” and the “National interest rate (e.g. for loans)”. The home renovation is a high costs investment for homeowners, and needs easy and favourable access to credit, also for countries where many financial mechanisms provide support to households. In Bulgaria, the “Rate of growth of the local economy” is also a high impact factor, due to the increase of the poverty rate, since 2008. The most affecting Social factors refer to “Social preference in owning a house instead of renting” and “Citizens awareness about the benefits of energy-saving/efficiency”. For the home renovation market, the homeownership rate is a key element for the OSS operability and success. Indeed, in owner-occupied homes where benefits, costs and disruption converge, there are more chances to start an energy-related home renovation project, than in rented houses. For instance, the three target areas the majority of homes are owner-occupied, over 80% in all the areas analysed. The household awareness about energy efficiency benefits is lacking in all cities, with many information gap and barriers emerging from the questionnaire results. The home renovation is a discretionary high-cost investment and homeowners need to be well informed and driven along the whole project. This calls for higher effort in terms of information and awareness-raising campaigns in all target areas. Finally, the analysis on Technological factors provides information about the innovation level reached by each target area. Questions on the diffusion of energy-efficient technologies produce the most interesting results. In the Padova area, RES production systems have a high diffusion, with a consequent reduction of costs for homeowners, while in Romania and Bulgaria RES production in residential and tertiary buildings is less common. In Romania and Bulgaria, the district heating systems have widely diffusion, for instance in Romania two-third of houses are connected to district heating systems. Romania also has the 3rd highest geothermal potential in Europe, but Geothermal heat pumps diffusion is very low, according to respondents. In general, the most common technologies are Condensing boilers and PV systems, while innovative technologies such as Energy storage systems, Cogeneration systems and Vehicle to grid technologies have a low diffusion in all areas analysed.

The analysis on the direct influence factors has been conducted on six categories of factors: 1) regulatory framework, 2) public incentives and subsidies), 3) technical measures and finance instruments for the home renovation, 4) real estate market situation, 5) market segmentation (potential costumers), and 6) market players. The most affecting factors within the regulatory framework are the “Mandatory (min) energy performance standards (for new buildings, major renovations)” and the “Mandatory (min) energy performance for heating systems”. Those regulatory measures are well rooted in all Countries’ regulatory framework which means high acceptance and awareness for the side of homeowners. Public financial mechanisms strongly affect the home renovation marketplace. “Public grants and funds”, “Fiscal rebates” and “Reduced interest rate public loans” have a higher impact in boosting home energy efficiency and encouraging home renovation. In Italy, the most common financial measures are related to fiscal rebates, while public grants are mostly used in Romania and Bulgaria. However, the reducing financial capacity of Bulgarian and Romanian Government, brings to a deep change in the financial mechanism, previously based on public financing programs covering 100% of the home renovation works. This change is increasing the difficulties in financing home renovation for homeowners and open interesting opportunities for third-party financing mechanisms. The analysis of technical instruments shows many similarities between the four target areas. The most common and relevant technical instruments are “Windows replacement and insulation”, “Walls and roofs insulation”, “Heat and cooling system-replacement”, and “Building facade renovation”, for multi-family housing. Integrated or deep renovation works are rare. An interesting result is the low impact of Energy audit in all target areas. This result

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differs from the literature, which considers the energy audit as a key instrument to drive homeowners' decisions and encourage them to invest in home renovation. The low impact of energy audit may be linked to the lack of awareness or the lack of direct incentives to cover the costs. Finally, the analysis on finance instruments aimed to rate the capacity of innovative financial instruments (e.g. On-bill financing model, Green mortgage, Loans supported by a guarantee mechanism, Energy performance contract model) to affect homeowners' behaviours and boost home energy efficiency. Even though innovative finance instruments are not common in the target areas, the questionnaire results show a high capacity to foster home renovation and support homeowners. The most relevant according to respondents are the "Loans supported by a guarantee mechanism" and the "On-bill financing model".

Home renovation depends also to the capacity for homeowners to reach information. In all target areas, the questionnaire results show high difficulties and barriers in reaching information, especially related to public incentives, technical and financial instruments. Information barriers mainly refer to the lack of homeowners' knowledge and skills to find information and understand it, also due to the overabundance of measures, especially in Italy. It would suggest for the OSS a crucial role in making information available and supporting homeowners in the decision-making process. In Padova area, the OSS could also provide technical services in order to overcome the fragmentation of the home renovation chain and guarantee the quality of works. In Timisoara and Bulgaria, the OSS could directly provide financial services and act as a guarantor, in order to reduce the investment risk for banks and increase access to credit. Indeed, in Bulgaria and Romania, few banks offer products for people with low incomes due to their higher risk profile.

The Energy Performance Certificate (EPC) for home selling and renting is mandatory in Italy and Romania, but only in Italy, it is always indicated in advertisements. The EPC is a relevant factor to drive the purchasing choices, more for the selling than renting, both in Italy and Romania. In both cases, it increases the value of properties. The results show a favourable situation for the OSS, also considering the high propensity in owning a house and the value attributed to them, which can improve the interest in the OSS services in the three target areas.

The analysis on market players shows in the Padova area the high presence of suppliers and potential OSS partners, and low presence of competitors and financiers. Potential customers are more related to final users, while design services providers are not seen as costumers. In Timisoara, there are many potential OSS partners (especially within the design chain, architects, engineers etc.), and few direct competitors and financiers, only linked to bank institutions. The analysis presents many different types of customers, grouped into 5 main categories: homeowners/tenants, owners associations, professional boards, building managers and building developers. In the two Bulgarian cities, Vidin and Smolyan, the results show few potential competitors, according to respondents. ESCOs and Energy desks are not common in Bulgaria, consultant services in the field of home renovation are mainly provided by Regional and National agencies and Architect/Engineering firms. There are many potential OSS partners and financiers (mainly Bank institutions, ESCOs, Energy companies, Foundations and Non-profit associations). In Bulgaria, the recent change in the home renovation financing mechanism opens new possibilities for the establishment of innovative businesses in a marketplace with few direct competitors and high request for home refurbishing works. The potential customers are more related to the final user and building managers.

Further analyses on the market segmentation and players composition are needed to better understand the effective market dimension. In the next months, focus groups will be planned with local actors and stakeholders.

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The internal factors analysis is structured in 3 sections: 1) OSS internal organization (human resources, physical resources and technological capabilities); 2) OSS financial scheme (budgeting, revenue stream and fee types, operational costs); 3) OSS external network and partnership. The OSS initiatives analysed are characterized by multi-disciplinary teams, with technical experts (mainly engineers), project managers and financial consultants. The majority of the OSS experimented the importance of employing experts in communication and process facilitation in order to engage homeowners and communities. All the OSS examined were set-up by public funds and receive a fee for their services. The main services provided by the OSS refer to information/consultancy services (i.e., energy audit), support in contractor's selection, technical and financial assistance, Smart funding, monitoring service. The fees are in many cases paid by contractors, suppliers, and homeowners. The external partnership is a key element for the OSS functioning in all initiatives analysed. All the OSS initiatives act as contractors' cluster cooperation and do not directly provide technical works. The consortium is planning other focus groups with local players. More information related to internal factors will be available in the next project deliverables

REFERENCES

Artola, I., Rademaekers, K., Williams, R., and Yearwood, J. (2016). Boosting Building Renovation: What potential and value for Europe? Directorate General for Internal Policies. Policy Department A: Economic and Scientific Policy (Vol. PE 587.326). Retrieved from:

[http://www.europarl.europa.eu/RegData/etudes/STUD/2016/587326/IPOL_STU\(2016\)587326_EN.pdf](http://www.europarl.europa.eu/RegData/etudes/STUD/2016/587326/IPOL_STU(2016)587326_EN.pdf)

ARERA. (2019). *Il bonus sociale elettrico e gas: stato di attuazione per l'anno 2018*.

<https://www.arera.it/allegati/docs/19/279-19.pdf>

Blank, M. (2019). Open Data Maturity Report 2019. Retrieved from

https://www.europeandataportal.eu/sites/default/files/open_data_maturity_report_2019.pdf

Bose, R.K., Burduja, S.L, Ionescu-Heroiu, M., and Mot, A.M. (2013). Romania - Improving energy efficiency in Timisoara. Washington DC; World Bank Group. Retrieved from:

<http://documents.worldbank.org/curated/en/305561468333031230/Romania-Improving-energy-efficiency-in-Timisoara>

BPIE (2011). Europe's Building under the Microscope: A Country-by-Country Review of the Energy Performance of Buildings. Retrieved from: [http://bpie.eu/wp-](http://bpie.eu/wp-content/uploads/2015/10/HR_EU_B_under_microscope_study.pdf)

[content/uploads/2015/10/HR_EU_B_under_microscope_study.pdf](http://bpie.eu/wp-content/uploads/2015/10/HR_EU_B_under_microscope_study.pdf)

Bulgaria National Census (2011). National Statistical Institute. Retrieved from:

<https://www.nsi.bg/en/content/13255/census-2011>

Cooper, L. (2000). Strategic marketing planning for radically new products. *Journal of Marketing*, 64(1), 1-15.

Cresme, (2020). XXVII Rapporto congiunturale e previsionale del Cresme. Il mercato delle costruzioni 2020.

Retrieved from: <http://www.cresme.it/it/congiunturale-cresme.aspx>

Economidou, M., Todeschi, V., Bertoldi, P. (2019). Accelerating energy renovation investments in buildings - Financial and fiscal instruments across the EU. Retrieved from <https://ec.europa.eu/jrc/en/publication/euro-scientific-and-technical-research-reports/accelerating-energy-renovation-investments-buildings>

D.2.2. STRATEGIC ASSESSMENT

Energy Charter Secretariat (2003). Third Party Financing: Achieving its potential (Vol. 3).

Energy Efficiency Act (2015). Retrieved from: <http://www.seea.government.bg/documents/ZEE.pdf>

European Commission (2017). Third Report on the State of the Energy Union. Energy Union Factsheet Bulgaria. Retrieved from: https://ec.europa.eu/commission/sites/beta-political/files/energy-union-factsheet-bulgaria_en.pdf

European Commission, and Directorate-General for Economic and Financial Affairs (2020). European Economic Forecast Winter 2020.

European Commission (2019). Energy efficiency assessment - 2018 progress report COM (2019) 224.

European Energy Performance of Buildings Directive (EPBD, 2010). Retrieved from: https://eur-lex.europa.eu/legal-content/EN/ALL/;ELX_SESSIONID=FZMjThLLzfxmmMCQGp2Y1s2d3Tjwtd8QS3pqdkhXZbwqGwlgY9KN!2064651424?uri=CELEX:32010L0031

Eurostat (2018). Current market rents in Europe. From surveys through estate agencies. Retrieved from: https://ec.europa.eu/eurostat/documents/6939681/7243182/Booklet_2019_rents_2018_e_DRAFT.pdf/1321ca38-8039-4f95-aade-434e9550462e

Eurostat (2019). Energy, Transport and environment statistics. 2019 edition. Retrieved from: <http://assets.dft.gov.uk/statistics/releases/transport-energy-and-environment-statistics-2011/energy-2011.pdf>

FIAIP, ENEA, I-Com (2018). Rapporto Annuale sull'andamento del mercato immobiliare urbano 2017. Valori, trend di mercato e previsioni per il 2018.

Frederiks, E. R., Stenner, K., and Hobman, E. V. (2015). Household energy use: Applying behavioural economics to understand consumer decision-making and behaviour. *Renewable and Sustainable Energy Reviews*, 41, 1385–1394.

Galletta, A.M. (2013). *Mastering the Semi-Structured Interview and Beyond*. New York: NY Press.

Georgiev, G. (2015). Bulgarian Housing. Status and Prospectives. *International Conference on Economic Sciences and Business Administration*, 2(1), 95–103.

Government of Romania. (2015). Report on the assessment of the national potential to implement high-efficiency cogeneration and efficient district heating and cooling. Retrieved from: <https://tradingeconomics.com/italy/home-ownership-rate>

Haavik, T., Tommerup, H., Svendsen, S., Paiho, S., Ala-juusela, M., Mahapatra, K., Gustavsson, L., et al. (2011). New business models for holistic renovation solutions of single-family houses. *Passivhus Norden Conference*, 1–13. Retrieved from: <http://www.one-stop-shop.org/sites/default/files/New-business-models-for-holistic-renovation.pdf>

IEA (2019). *Global Status Report for Buildings and Construction 2019*, IEA- Retrieved from: <https://www.iea.org/reports/global-status-report-for-buildings-and-construction-2019>

D.2.2. STRATEGIC ASSESSMENT

ISTAT (2019). Annuario statistico italiano. Retrieved from: <https://www.istat.it/it/files//2019/12/Asi-2019.pdf>

Italian National Energy and Climate Plan (PNIEC, 2020). Retrieved from: https://www.mise.gov.it/images/stories/documenti/it_final_necp_main_en.pdf

Jan, Y. (2002). A three-step matrix method for strategic marketing management. *Marketing Intelligence and Planning*, 20(5), 269-272.

Kerr, N., and Winskel, M. (2018). Private household investment in home energy retrofit – reviewing the evidence and designing effective public policy.

Leech, B. L. (2002). Asking Questions: Techniques for Semistructured Interviews. *Political Science & Politics*, 35, 665–668.

Maller, C.J., Horne, R.E. (2012). Living lightly: how does climate change feature in residential home improvements and what are the implications for policy? *Urban Policy Res*, 29(1), 59–72.

Ministry of Energy and Ministry of Environment (INECCP, 2018). Integrated National Energy and Climate Change Plan for Romania (2021-2030).

National Energy Strategy (2017). Retrieved from: <https://www.mise.gov.it/images/stories/documenti/Testo-integrale-SEN-2017.pdf>

PadovaFIT project (2018). A financing investment tool for the retrofitting of housing in the Padova area. Final Report. Retrieved from: <http://www.padovafit.it/wp-content/uploads/2018/05/FINAL-PUBLISHABLE-REPORT-1.pdf>

Padova Sustainable Energy Action Plan SEAP (2011). Retrieved from: https://mycovenant.eumayors.eu/docs/seap/264_218_1309421560.pdf

Pardo-Bosch, F., Cervera, C., and Ysa, T. (2019). Key Aspects of Building Retrofitting: Strategizing Sustainable Cities. *J. Environ. Manage*, 248, 109-247.

Pwc. (2019). Real Estate Market Overview. Italy.

Regione Veneto. (2020). Bollettino socioeconomico del Veneto.

Rugina, M., and Lazar, I. (2012). Energy Efficiency Policies and Measures in Romania. Monitoring of EU and national energy efficiency targets. Bucharest.

Seap Timisoara (RO) (2010). Strategia locală privind schimbările climatice în Municipiul Timișoara. Plan strategic de acțiuni privind combaterea, atenuarea și adaptarea la efectele Schimbărilor Climatice în municipiul Timișoara

The World Bank. (2017). Bulgaria Housing Sector Assessment. Final Report.

Ürge-Vorsatz, D., Eyre, N., Graham, P., Harvey, D., Hertwich, E., Jiang, Y., et al. (2012). Energy end-use: buildings. Global energy assessment. Cambridge, UK: Cambridge University Press.

D.2.2. STRATEGIC ASSESSMENT

Vassilev, V., and Spassova, C. (2015). HERON project D.1.2. Status-quo analysis of energy efficiency policies in 8 EU countries. National Report for Bulgaria.

Volt, J., Mariangiola, F., and de Groot, M. (2018). Understanding potential user needs. A survey analysis of the markets for Individual Building Renovation Roadmaps in Bulgaria, Poland and Portugal. Retrieved from <http://bpie.eu/publication/understanding-potential-user-needs/>

W., Adams (2015). Conducting Semi-Structured Interviews, in J., Wholey; H., Hatry; K., Newcomer (eds) Handbook of Practical Program Evaluation, San Francisco. USA: Jossey-Bass, 492-5.

Weiss J, Dunkelberg E, Vogelpohl T. (2012). Improving policy instruments to better tap into homeowner refurbishment potential: lessons learned from a case study in Germany. Energy Policy, 44, 406–15

Wilson, C., Crane, L., and Chrysochoidis, G. (2015). Energy Research & Social Science Why Do Homeowners Renovate Energy Efficiently? Contrasting Perspectives and Implications for Policy. Energy Res. Soc. Sci, 7, 12–22.

ANNEX 1 – QUESTIONNAIRE

Block 1: The political, economic, social and technological contextual situation

Please rate the influence of the following political factors on the home renovation in your territory

	High	Moderate high	Average	Moderate low	Low
Local political stability					
National complexity of regulatory procedures (bureaucracy)					
National competition regulation for companies					
Local authority's commitment to energy efficiency					
Coherence level between energy local policies, regional policies and national policies					
Local heritage preservation policies					

Please rate the influence of the following economic factors on the home renovation in your territory

	High	Moderate high	Average	Moderate low	Low
The rate of growth of the local economic					
The capacity to access to credit for private actors					
National interest rate (e.g. for loans)					
Local trend for private investments on home retrofitting (for home and tertiary buildings)					

Please rate the influence of the following social factors on the home renovation in your territory

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	High	Moderate high	Average	Moderate low	Low
Citizens awareness about the benefits of energy-saving/efficiency					
Social approval linked to energy efficiency behaviours					
Houseowner consideration of home retrofitting as a long-term investment					
Social preference in owning a house instead of renting it					

Please rate the influence of diffusion of the following technology systems in your territory (for home and tertiary buildings)

	High	Moderate high	Average	Moderate low	Low
Condensing boilers					
Solar electric, or photovoltaic (PV), systems					
Solar thermal, including solar hot water and space heating					
Heat pumps (air to air and water heat pumps)					
Geothermal heat pumps					
Cogeneration systems or combined heat, cooling and power (CHP)					
Energy storage systems (e.g. home or grid-scale batteries; thermal storage)					
Biomass systems					
Electric vehicles					
Vehicle to grid technology					
District heating/cooling systems					

Additional notes

Can you identify any other political, economic, social and technological factors affecting the home retrofitting marketplace in your target area?

Block 2: Home renovation regulatory measures in your local area

Please indicate which regulatory measures most affect the homeowners' behaviours. You can select more options.

Type	Not present	Low	Average	High
Building code				
Minimum Energy Performance Standards (i.e., for major home renovations)				
Minimum Energy Performance for heating				

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systems				
Mandatory energy performance certificates (for home renting/selling)				
Mandatory products certifications/labels				
Others (please indicate)				

Please indicate which regulatory measures are the most useful for boosting home energy efficiency. You can select more options.

Type	Not present	Low	Average	Local
Building code				
Minimum Energy Performance Standards (i.e., for major home renovations)				
Minimum Energy Performance for heating systems				
Mandatory energy performance certificates (for home renting/selling)				
Mandatory products certifications/labels				
Others (please indicate)				
Building codes				
Minimum Energy Performance Standards (i.e., for major home renovations)				

For homeowners, how much is relevant the access to regulatory information?

High	Moderate high	Average	Moderate low	Low
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For homeowners, how difficult is the access to regulatory information?

High	Moderate high	Average	Moderate low	Low
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Do you think that the OSS should provide support to access regulatory information?

YES/NO

Block 3: Home renovation public incentives and subsidies in your local area

Please indicate which incentive measures are the most attractive for the homeowners. You can select more options.

Type	Not present	Low	Average	High
Volumetric				

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incentives				
Fiscal rebates				
Construction rights rebates				
Public grants				
Reduced interest rate public loans				
Energy Efficiency Revolving Funds				
Others (please indicate)				

Please indicate which incentive measures are the most useful for boosting home energy efficiency. You can select more options.

Type	Not present	Low	Average	Local
Volumetric incentives				
Fiscal rebates				
Construction rights rebates				
Public grants				
Reduced interest rate public loans				
Energy Efficiency Revolving Funds				
Others (please indicate)				

For homeowners, how much is relevant the access to incentives information?

High	Moderate high	Average	Moderate low	Low
------	---------------	---------	--------------	-----

For homeowners, how difficult is the access to incentives information?

High	Moderate high	Average	Moderate low	Low
------	---------------	---------	--------------	-----

Do you think that the OSS should provide support to access incentives information?

YES/NO

Block 4: Home renovation technical instruments in your local area

Please indicate which technical instruments are the most attractive for the homeowners. You can select more options.

Type	Not present	Low	Average	High
Energy audit				
Windows replacement and insulation				

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Walls insulation				
Roof insulation				
Facade renovation (multi-family housing)				
Heat and cooling system replacement				
Home automation				
RES plants installation				
Green roof/Blue roof				
Integrated interventions				
Others (please indicate)				

Please indicate which technical instruments are the most useful for boosting home energy efficiency. You can select more options.

Type	Not present	Low	Average	Local
Energy audit				
Windows replacement and insulation				
Walls insulation				
Roof insulation				
Facade renovation (multi-family housing)				
Heat and cooling system replacement				
Home automation				
RES plants installation				
Green roof/Blue roof				
Integrated interventions				
Others (please indicate)				

For homeowners, how much is relevant the access to technical information?

High	Moderate high	Average	Moderate low	Low
------	---------------	---------	--------------	-----

For homeowners, how difficult is the access to technical services?

High	Moderate high	Average	Moderate low	Low
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Do you think that the OSS should provide support to access technical services?

YES/NO

Do you think that the OSS should provide technical services?

YES/NO

Block 5: Home renovation finance instruments in your local area

Please indicate which finance instruments are the most attractive for the homeowners. You can select more options.

Type	Not present	Low	Average	High
Energy performance contract model				
On-bill financing model				
Green mortgage				
Loans supported by a guarantee mechanism				
Others (please indicate)				

Please indicate which finance instruments are the most useful for boosting home energy efficiency. You can select more options.

Type	Not present	Low	Average	Local
Energy performance contract model				
On-bill financing				
Green loans				
Loans supported by a guarantee mechanism				
Others (please indicate)				

For homeowners, how much is relevant the access to finance information?

High	Moderate high	Average	Moderate low	Low
------	---------------	---------	--------------	-----

For homeowners, how difficult is the access to finance services?

High	Moderate high	Average	Moderate low	Low
------	---------------	---------	--------------	-----

Do you think that the OSS should provide support to access finance services?

YES/NO

Do you think that the OSS should provide finance services?

YES/NO

Block 6: The real estate market in your target area

How relevant is the certificate of building energy performance in increasing the value of a property?

High	Moderate high	Average	Moderate low	Low
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How relevant is the certificate of building energy performance in increasing the value for home renting?

High	Moderate high	Average	Moderate low	Low
------	---------------	---------	--------------	-----

How often is the Building energy performance class indicated in advertisement for selling and renting properties?

Mandatory	Most of the time	About half the time	Sometime	Never
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Block 7: Players and customers in your target area

Please indicate per each local actor listed below the role covered. If the actor can cover multiple roles, please select the corresponding ones.

	Not Present	Final user/ Customer	Supplier	Partner	Financiers	Competitor
Energy communities						
Private homeowners						
Tenants and owners' unions						
Building Managers						
Building facility managers						
Building developers						
Construction companies						
Architects						
Engineers						
Architects/engineer professional boards						
Manufacturers (technology providers, e.g. photovoltaic panels, heat pumps, etc.)						
Software providers						
Energy desks						
ESCos						
ESCo associations						
Utilities (Public-Private companies employed in energy production and supply)						
Energy companies						
Financial operators						
Foundations (interested, or already involved in home renovation projects)						
Non-profit association (interested, or already involved in home renovation projects)						

Please indicate per each local actor listed below the potential interest in the OSS services.

	Not Present	High interest	Moderate high	Average interest	Moderate low	Low interest
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			interest		interest	
Energy communities						
Private homeowners						
Tenants and owners' unions						
Building Managers						
Building facility managers						
Building developers						
Construction companies						
Architects						
Engineers						
Architects/engineer professional boards						
Manufacturers (technology providers, e.g. photovoltaic panels, heat pumps, etc.)						
Software providers						
Energy desks						
ESCos						
ESCo associations						
Utilities (Public-Private companies employed in energy production and supply)						
Energy companies						
Financial operators						
Foundations (interested, or already involved in home renovation projects)						
Non-profit association (interested, or already involved in home renovation projects)						

Additional notes

Can you identify any other customers segments in your target area?

Can you identify any other players (competitors, substitutes and complementary businesses) in your target area?