

SWOT ANALYSIS OF A ONE-STOP-SHOP INITIATIVE IN THE 4 PILOT AREAS

Task 2.3



2.3 SWOT ANALYSIS

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Authors	Edoardo Croci, Annamaria Bagaini, Tania Molteni, Benedetta Lucchitta



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Project partners	Main contact person	E-mail
Città di Padova	Daniela Luise Giovanni Vicentini	luised@comune.padova.it vicentinig@comune.padova.it
Università Commerciale Luigi Bocconi	Edoardo Croci Annamaria Bagaini	edoardo.croci@unibocconi.it annamaria.bagaininibocconi.it
SINLOC	Andrea Martinez	andrea.martinez@sinloc.com
SOGESCA srl	Marco Devetta	m.devetta@sogesca.it
Forum per la Finanza Sostenibile	Alessandro Asmundo	asmundo@finanzasostenibile.it
Climate Alliance	Jonas Roennefarth	j.roennefarth@climatealliance.org
Municipality of Timisoara	Iudit Bere–Semeredi	iudit.bere@primariatm.ro
Energy Agency of Plovdiv Association	Milena Agopyan	milena.agopyan@eap-save.eu



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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

The building sector has a significant role in reducing European carbon emissions and energy consumption. Indeed, the building sector is responsible for almost 40% of energy- and process-related emissions (IEA, 2019). Despite the introduction of several policies and measures focused on boosting energy efficiency (EE) in the building sector, around 75% of Europe's housing stock is still inefficient, and renovation rates remain low (Hunkin & Krell, 2019). Only 1 to 2%¹ of the building stock is replaced annually in the EU (European Commission, 2019). This figure is much lower than the one which should be observed to remain in line with the European ambitions (2030² and 2050³ goals) and achieve the Paris Agreement. There is a need to accelerate the market uptake and large-scale implementation of energy-efficient refurbishment solutions and increase the annual renovation level to 3% per year until 2030 (Laffont-Eloire et al., 2020).

Many barriers hinder the implementation and success of energy efficiency policies and measures. Those barriers can be resumed in 4 main categories: 1) financial barriers (high up-front costs, low access to finance, long payback, high prices for new technologies); 2) institutional and administrative barriers (regulatory issues, institutional commitment, bureaucracy); 3) social barriers (information gap, shared awareness, distrust, long decision-making process, separation of expenditure and benefits between homeowners and tenants) (Bagaini et al, 2020); 4) home renovation market characteristics (quality assurance, professionals skills, market fragmentation). Indeed, the building process usually involves multiple separated disciplines and players, which leads to additional costs and risk of failure.

¹ This rate depends on what is assumed as building renovation. Navigant and Ipsos Belgium (2019) distinguish three different depths of energy retrofit: 1) depth retrofit with the aim to achieve 60% of primary energy savings, 2) medium home renovation with 30% of primary energy savings; and 3) below threshold home renovation, like replacing a boiler, with low impact on primary energy savings, less than 3%. Currently, all residential retrofits taken together lead to primary energy savings of 1% per year for the EU as a whole (Navigant and Ipsos Belgium, 2019). The most contributing interventions for decarbonizing the building sector refer to depth retrofit, with high energy savings achievement. Such interventions require holistic and integrated solutions, which increase the costs of investments, the requirements in terms of knowledge and management capacities.

² Energy Performance of Building Directive (EPBD) EU 2018/844, Energy Efficiency Directive EU 2018/2002.
https://ec.europa.eu/energy/topics/energy-strategy/clean-energy-all-europeans_en

³ 2050 long-term strategy.

https://ec.europa.eu/clima/policies/strategies/2050_en#:~:text=The%20EU%20aims%20to%20be,action%20under%20the%20Paris%20Agreement.



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The One-stop-shops (OSS) have been advocated by the European Commission through the “new” EPBD (Directive 2018/844/EU), as a mean to overcome these barriers and support homeowners in the home renovation process. An OSS is widely considered as a physical or virtual structure where multiple services are provided to offer customers all they need for the home retrofitting in just “one-stop”. One-Stop-Shops (OSS) bring together the large gamut of services into a single body, working with other players and stakeholders to provide all required skills and knowledge for home renovation, significantly reducing the burden for homeowners to improve their energy performance (Hunkin & Krell, 2019). Many OSS initiatives exist in Europe and beyond (Bertoldi, Boza-Kiss, 2019). Despite they share the same intent and ambition, their business models configurations can vary (Boons & Lüdeke-freund, 2013).

The COVID-19 pandemic has strongly impacted the economy also regarding the home retrofitting market. The effects on families’ financial capacity, interest and priorities may further decrease the renovation rate. Despite the huge reduction of CO2 emission and energy consumption, due to lockdown measures adopted worldwide, Countries’ commitment in terms of energy efficiency should not be reduced (European Commission, 2020). In July 2020 the European Council agreed to a massive recovery fund: The Next Generation EU (NGEU)⁴ in order to support member states hit by the COVID-19 pandemic. The fund should not be allocated to help absorb a shock, but to provide financial support for investment linked to EU priorities: make the future Europe greener, more digital and more resilient. The home energy upgrading process may benefit from this economic support, which can help to revitalize the building sector. The COVID-19 pandemic and related restriction strategies increased also the key role covered by the indoor environment, in terms of comfort, well-being and reduction of unhealthy physical and psychological conditions. Home renovation and energy retrofits can produce many advantages for households and building occupants, by e.g.: improve well-being and occupant’s health (Willand et al, 2015), reduce fuel poverty (Sovacool, 2015), reduce utility bills and maintenance costs (Xu et al, 2011). Therefore, retrofit actions might also generate new job opportunities and open new and powerful business for stakeholders involved within the whole process (Brown, 2018).

Within this crucial phase, PadovaFIT EXPANDED aims to design, develop and pilot a One-Stop-Shop in order to foster home retrofitting and reduce energy consumption and CO2 emission, in line with the EU goals. Two OSS will be piloted in two target areas: Padova (IT) and Timisoara (RM), whose will give the base for developing a strategic plan to implement one in the metropolitan area of Smolyan and Vidis (BR). The project will also contribute to increasing the knowledge about OSS design and implementation.

The project brings together a consortium of 8 partners coming from four EU member states. The consortium is coordinated by the Municipality of Padova supported by Bocconi University, SINLOC, SOGESCA, Forum per la Finanza Sostenibile and Climate Alliance, a European network of local authorities for sustainability.

⁴ https://ec.europa.eu/info/strategy/recovery-plan-europe_en#nextgenerationeu



2. AIM AND OBJECTIVE

In order to design a successful OSS, it is crucial to collect information concerning territorial characteristics and peculiarities. Information refers on one side to climatic issues, building characteristics (e.g., state and age of the building stocks), and families' financial capacity; and on the other side to institutional, social, behavioural, and technological issues, which can directly or indirectly affect the OSS marketplace and shape the future business model. Information concerning the first two groups comes from deliverables 4.2 and 5.2. Data concerning the direct and indirect influencing factors come from the analysis conducted for the Strategic assessment, deliverable 2.2.

The deliverable aims to assess collected data through a SWOT analysis. The SWOT analysis is a tool that helps to identify and evaluate key factors which can influence a specific environment. It is used for understanding and assessing complex situations, like the home renovation process, and provides a significant base to design innovative strategies. The acronym SWOT stands for “strengths”, “weakness”, “opportunities” and “threats” (Gürel & Tat, 2017). The SWOT analysis has two dimensions: internal and external. Internal dimension includes strengths and weaknesses, external dimension includes opportunities and threats. Through the SWOT is possible to identify barriers hindering the home renovation, that the OSS business model should consider for switching weaknesses and threats into opportunities and strengths. The SWOT also permits to show out favourable conditions to take in consideration when the OSS business model will be defined.

According to the literature (Haavik et al., 2012; Mahapatra et al., 2013; Brown, 2018; Bertoldi & Boza-Kiss, 2018; Pardo-Bosch et al., 2019; Laffont-Eloire et al., 2020), the home retrofitting and renovation market is characterised by high fragmentation. It requires the involvement of multiple players at different stages of the renovation process, including designers, utilities, energy auditors, project managers, financiers, equipment providers and construction companies (Hunkin & Krell, 2019). Nevertheless, several non-technical stakeholders also influence the decision-making process, such as building administrators, municipalities, local authorities and local energy/building renovation agencies. This complexity and the need for multiple and separated players, knowledge and expertise usually lead to additional costs and risk of failure. It is crucial to



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identify all stakeholders⁵ involved in the renovation process and assess their interaction, influence and interest to the OSS, in order to better design the business model and take advantages from the existing network of players. For this reason, a stakeholder analysis has been developed per each target area. The stakeholder analysis can help to:

- identify local players within the home renovation chain, who may affect or be affected by the OSS,
- evaluate the degree of interests and influence of all stakeholders,
- identify stakeholders that should be encouraged to participate in different stages of the project,
- understand the role assumed by each stakeholder in order to reduce potential negative impacts and manage negative stakeholders,
- develop communication strategies for engaging all stakeholders during the project,
- identify key local partners and supporters for information distribution during the piloting phase.

⁵ A stakeholder is a person, a company or organization who could depend on the OSS for the realization of some of its goals, and in turn, the OSS could depend on them in some way for the full realization of its goals (adapted from Mendelow, 1981). Stakeholders may possess resources or expertise which the new business may require, giving them power over the new organizations. A basis of power may be derived through the use of influence (Mendelow, 1981).



3. METHODOLOGY AND APPROACH

The SWOT analysis is based on information collected on previous deliverables 2.2-4.2, and 5.2. Information concern:

- Built environment characteristics (buildings size, age, type, energy performance),
- Homeowners financial capacity (families' economic status, household contract type, average annual expenditure in gas and electric energy, access to mortgages, etc.),
- Factors with an indirect influence on the home renovation marketplace (political, economic, social, and technological situation at the local level),
- Factors with a direct influence on the home renovation marketplace (local policies and regulatory framework; diffusion of technical measures and finance instruments for home renovation; real estate market situation; market segmentation; and market players).



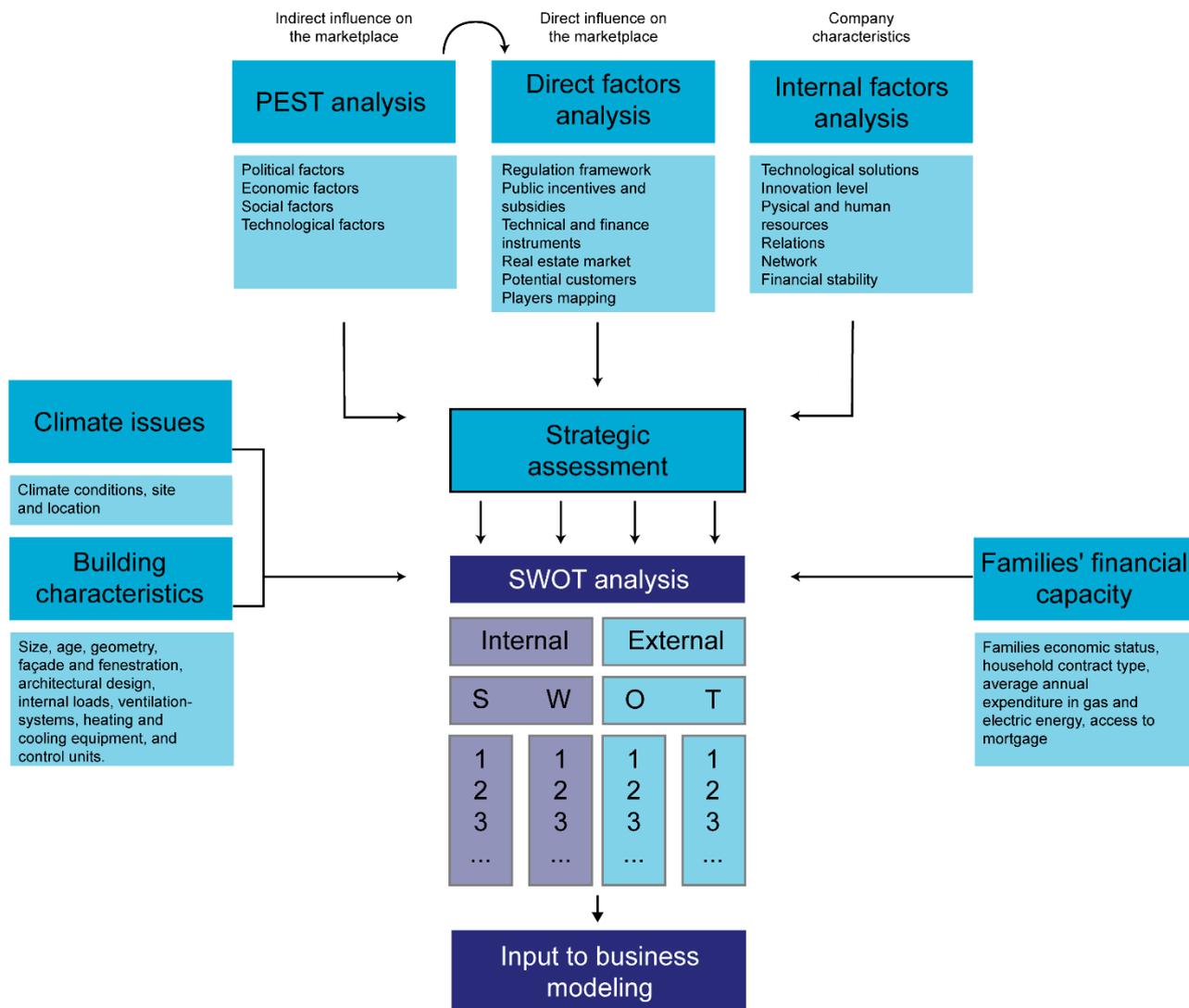


Figure 1 Methodology approach - SWOT analysis

For each target area a SWOT matrix has been developed. Key factors are assessed according to their relevance and nature dimension (internal or external dimension) and categorized into 5 main categories: 1) built environment, 2) institutional framework, 3) economic issues, 4) social issues, and 5) home renovation market characteristics.

A first draft of the SWOT analysis has been discussed with local partners, in order to verify and double-check each factor identified and add further information, as quantitative data or references.

The second phase of the analysis has regarded the study of local stakeholders' network. Three Stakeholder analyses have been developed, one per each target area. The stakeholder analysis is made up of three steps:

1. Stakeholders identification,
2. Stakeholders categorization,
3. Stakeholders mapping.



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The first step aims to determine who the stakeholders are. The goal is to develop a detailed list of organizations and institutions which could affect or be affected by the OSS or contribute to realizing the OSS goals.

The second step aims to assess the grade of stakeholders' power, influence, and interest. A power-interest grid, which maps out the stakeholders and classifies them according to their power and interest on the OSS, has been developed per each target area (adapted from Mendelow, 1981). Each stakeholder identified during the first step has been placed in the grid, according to its power/influence and interest level.

The third step aims to understand the role of stakeholders and their relationship with the OSS. They could be strong supporters, key partners, suppliers, project investors, customers, or they could be seen as competitors or even as blockers. The analysis is important to recognise and qualify stakeholders, but also for developing adequate relationship strategies and overcome potential obstacles.

The Stakeholder analysis has been developed through a questionnaire delivered to project partners. Questions aim to:

- identify the presence or absence of a list of shareholders in each target area and the geographical scope of their activities (local level, regional/county level, or national level). The stakeholder list is based on literature review and information collected for the deliverable 2.2,
- rate the degree of interest and influence⁶ for each stakeholder identified. Each stakeholder would obtain an influence and interest rating between 1 (low) to 5 (high),
- identify per each stakeholder the relationship with the OSS, between Partner, Supplier, Advocate-supporter, Investor, Customer, Competitor, Blocker⁷.

The results show the current situation, the supposed influence/interest level and the role covered by each stakeholder. Stakeholders have been not directly engaged and questioned in this project phase. Further analysis will follow in the next months when local players and stakeholders will be involved in the project.

⁶ Influence/power: the degree of perceived importance, and the capability of influencing other players and changing their actions. The ability to influence stakeholders within a network or environment depends on current and potential resources, specific knowledge and skills. The capacity of facilitating or impeding the achievement of objectives (e.g. the possession of key resources useful for the OSS work, the ability to open alternatives for the OSS setup (e.g. develop a joint venture), the capacity to reduce the OSS operation). Interest: represents the level of sensitivity about a specific topic. For a customer, it refers to the service's appeal, for a supplier the opportunity to sell products or services to the OSS (enlarge the market), for a partner the opportunity to open a new business with the OSS.

⁷ Partner (a company or organization who closely collaborates with the OSS to provide services);
 Supplier (a company or organization who provides key services and products to the OSS);
 Advocate-Supporter (a company or organization who supports the OSS, by publicity, endorsements, providing new customers, etc.);
 Investor (a company or organization who provides financial resources to the OSS);
 Customers (final users of the OSS business);
 Competitor (a company or organization who delivers similar services, which competes within the same market);
 Blocker (a company or organization who acts as an obstacle to the OSS).



4. RESULTS

The analyses have been conducted for the three target areas. Results are articulated in 2 sections: SWOT analysis, and Stakeholder analysis.

The SWOT analyses show that there are many factors which affect the home renovation and retrofitting process, both from the supply and demand side.

On the demand side, homeowners who want to approach the home renovation have to acquire information, expertise and knowledge coming from a large number of providers and professionals. Homeowners should be aware of a large number of legal and regulatory requirements, administer many certifications, and apply for grants, loans or other forms of financing (Bertoldi & Boza-Kiss, 2018). Collecting information is time-consuming and requires technical knowledge to establish informed choices about the best solution for the home retrofitting. The analysis shows that information barriers and long and complex decision-making process (especially for multi-family housing) are the most recurring weakness in the three target areas. The financial access is also problematic, due to the high-interest rate for loans and the lack of specific measures for low-medium income families and ethnic minorities. The COVID-19 pandemic has tightened the economic crisis and decreased the families' financial capacities, changing priorities and interests. In Europe, several national and regional financing programs exist, such as incentives, subsidies, grants, fiscal rebates, etc. (Economidou et al, (2019) analysis different economic policies and measures adopted in EU). Those are linked to several building performance requirements, which are mandatory in the three target areas, like minimum standards for new building and major renovations, heating systems standards, energy certificates for selling and renting homes, etc (Rugina & Lazar, 2012; Georgiev, 2015; ENEA, 2020). The positive impact of those measures emerges as a strength and opportunity in all target areas. The implementation of such policies and measures show a high local interest and commitment in supporting home renovation, which creates favourable conditions for developing new dedicated programs and initiatives, like the OSS.

On the supply side, the home renovation chain is characterised by high fragmentation, with low interaction and cooperation between operators. The renovation actors (planners, engineers, installers, manufacturers, financial partners, etc.) operate separately, reducing the capacity to deliver holistic renovation services. Indeed, the majority of renovations are implemented as individual small interventions (windows and heating systems replacements), bringing a little contribution in terms of moving towards decarbonisation of the building stock. The lack of trust and the lack of quality assurance are the most recurring weakness in the



study areas. Local players also have difficulties in engaging homeowners, who need to be informed and led along the whole retrofitting process. Home retrofitting is a high-cost investment for homeowners, with long pay-back periods. Trust and quality guarantee are primary requirements for convincing homeowners to invest in energy efficiency.

4.1 PADOVA PILOT CASE

4.1.1 SWOT ANALYSIS

Built environment

- High home owner-occupied rate (69.5%, ISTAT 2011)
- High percentage of buildings built before 1970 (59.3%, ISTAT, 2011)
- Majority of buildings with few owners (semi-detached houses and small apartment buildings) – less than 4 dwellings per building (78.9%, ISTAT, 2011)

Institutional framework

- High level of local commitment related to energy transition and climate change (SEAP 2011 approved, SECAP going to be approved in 2021)
- Building code implementing energy strategies (updated version in 2020)
- High level of local authority expertise in supporting home renovation programs (PadovaFIT 2013-2017, PadovaFIT Expanded 2019-2022)
- Energy data availability (municipal level and by census parcel from energy suppliers)

Economic issues

- Presence of local incentives for home renovation (incentives for the realization of NZEB buildings)

Social issues

- High interest in the OSS (especially from final users – homeowners)
- High diffusion and acceptance for RES production systems in private homes (great diffusion of PV and ST systems on the rooftops)

Home renovation market

- Presence of many highly qualified local companies and professionals within the home retrofitting chain

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Institutional framework

- High national commitment related to energy transition and climate change (PNIEC, 2019, Clean energy package directives adoption within 2021)
- Mandatory normative compliance for technological systems (e.g., heating systems)
- Energy Performance Certificate mandatory after renovation works (involving envelope insulation - over 50% -, and heating system replacement) and for selling and renting houses
- High EE standards required for new construction and major renovation projects (“Requisiti Minimi” decree, updated every 5 years)
- Legal and financial opportunities for the development of energy communities (d.l. n.162 2019, Decreto Rilancio)

Economic issues

Built environment

- Low home renovation rate (around 1% per year)
- Low diffusion of innovative technologies (e.g., cogeneration systems, private energy storage, smart metering and home automation solutions, Vehicle to grid technology, district heating systems)

Institutional framework

- Strong heritage preservation policies (Padova has one of the biggest historical city centres in Italy- 15% of residential buildings are located in the historical area)

Social issues

- Information barriers (homeowners have moderate-high difficulties to access information)
- Lack of trust in effective energy savings after home renovations
- Decision-making processes long and complex, especially for multi-owner houses
- Population ageing trend (1/3 of the population is over 65, growing trend, ISTAT, 2019)

Home renovation market

- Fragmentation of the renovation market
- Small and individual interventions (windows and heating systems replacements mostly) (thermal insulation interventions represent only 10.5% of the total, ENEA, 2018)

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Institutional framework

- Low multi-governance coherence
- Quality control and guarantee for work/services not mandatory for residential home renovation
- Complex procedures and bureaucracy (particularly relevant for the Super bonus 110%)

Economic issues

- High up-front costs for home renovation
- Long pay-back times of retrofitting interventions
- Lack of measures to split benefits/costs between owners and tenants
- Families in energy poverty are potentially excluded from the renovation process (difficulties to access credit)

Social issues

- Lower inclination to make investments due to the Covid-19 economic and social impacts (10% decline in new building



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- Several national fiscal and financial measures (becoming structural measures until 2022) (Super bonus 110%, Ecobonus, Sismabonus, White Certificates, Conto Termico)
 - Fiscal bonus transfer to third parties and invoice discounts are allowed (Super bonus 110%, Ecobonus, Sismabonus, Conto Termico)
- Home renovation market issues**
- Real estate sector recognises the value of EE, which highly increase the value of properties (less for the home renting market) (22% of buildings sold in 2018 are in Class A and B, ENEA, 2019)
 - Building renovation activity worthy around 73% of the residential construction sector value (Cresme, 2020)
- construction and retrofit investments expected in 2020, IEA 2020)
- The EE is not a dominating factor for renting home
- Home renovation market**
- Low cooperation between different stakeholders
 - Fast obsolescence process for technologic systems rather than investment pay-back for homeowners

Table 1 SWOT matrix – Padova pilot case

1. Strengths

Padova is characterized by a high percentage of semi-detached houses and small apartment buildings (52% have two floors, 23% three floors) with few homeowners to engage and convince in terms of renovation projects. For multi-family houses, the decision-making process is usually longer and more complex than for single-family houses. For those cases, homeowners/tenants' unions and building managers increase in relevance to facilitate the engagement process of final users. The majority of buildings are dated between the 60s and 80s with modest energy performances (only 4% of residential buildings were built after 2000, with higher energy performance, PadovaFIT EXPANDED D.4.2). This shows a high market potential for the OSS in terms of clients. In the Padova area, is high the amount of people owning a house (around 80%). It is amply recognised in the literature (Weiss et al, 2012; Wilson et al, 2015; Pardo-Bosch et al, 2019) that homeownership is a critical factor, both in terms of motivation and economic investment. Indeed, 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.

Another factor refers to the local commitment in terms of energy transition and climate change. Padova municipality approved a Sustainable Energy Action Plan in 2011, and it is developing a new Sustainable Energy and Climate Action Plan (2021). The local Building Code (updated in 2020) integrates the national and regional regulatory frameworks. The presence of regional and local incentives for home renovation (incentives for NZEB buildings following the Building code), plus the expertise of local authority in supporting home renovation programs (PadovaFIT 2013-2017, PadovaFIT Expanded 2019-2022) made the Padova area a favourable place for launching a One-Stop-Shop.

On the supply side of the home renovation, in the Padova area, there are several highly qualified companies and professionals, according to data collected in Deliverable 2.2 and provided by local experts. The high presence of qualified professionals increases the capacity to deliver services to homeowners on one hand but can also bring to competition issues to the other hand. The OSS can act as mediator reducing this problem and creating a collaborative environment, which shares benefits along the supply chain.

The availability of energy data (at the municipal level and by census parcel from energy suppliers) increases the potential for developing energy demand and supply maps. Such of maps aim to clarify the characteristics of a specific energy pattern (demand, supply, production and distribution), through the spatial visualization of energy data, which can support "informed" interventions, suggest strategies, and identify priorities in terms of policies and public programs (Fremouw et al, 2019). Energy data and energy visualization tools are also useful for activating the participation of all urban actors, from suppliers to final users. The use of these tools



supports inclusion, influences behaviour and increases overall awareness, showing the advantages of decisions and enabling community participation (i.e., by the creation of local energy communities).

2. Weakness

Information barriers are the most affecting factors for the home retrofitting. Homeowners have moderate-high difficulties to access information and generally low adequate skills and knowledge to make correct decisions. Home retrofitting is a high-cost investment and high-time consuming. It requires several technical skills in order to select the most suitable alternatives. The benefits coming from such interventions, both economic and about well-being, are not immediately clear. The lack of shared awareness, fragmented information, complex and long procedures for getting grants, and overabundance and redundancy of energy-related policies hinder the home retrofitting process. This could represent a limit also for the OSS creation, which must face those barriers. Besides, the lack of trust in effective energy savings and the lack of quality guarantee for works and products (not mandatory for residential interventions), further reduce the home renovation appealing.

Homeowners have to deal with several barriers when they approach home renovation interventions. The renovation market fragmentation brings homeowners to prefer small and individual interventions (windows and heating systems replacements mostly), reducing the need for searching and interacting with many companies and professionals who play in a highly competitive environment. According to ENEA (2019) in the period 2014-2018, 14.000 refurbishment interventions 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.

The last factor which can hinder the home renovation rate in the Padova area is the strong heritage preservation policies. Indeed, Padova has one of the biggest historical city centres in Italy. In cities with high historic value, heritage preservation policies limit the possibilities for deep building renovations. For instance, homeowners are not allowed to install RES plants or 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. The complexity of procedures for getting permissions and the amount of technical knowledge necessary to deal with such interventions may increase the difficulties for non-expert homeowners.

3. Opportunities

External opportunities refer to factors not directly link to territorial characteristics. The most relevant factors regard the national political framework, which can influence and boost the home retrofitting. In Italy there are several national fiscal and financial measures (Super bonus 110%, Ecobonus, Sismabonus, White Certificates, Conto Termico, etc.)⁸, focusing on the home renovation. Fiscal rebates and incentives give economic support to homeowners for interventions like windows replacement and insulation, walls and roofs insulation, heat and cooling systems replacement, RES plants installation. Those can be applied to all building typologies (Residential, Public buildings, Social Housing and Commercial buildings). For private buildings, the fiscal rebate can be also transferred to suppliers who realise the interventions. In May 2020 the Italian

⁸ The common characteristic of these incentives is the ability to deduct the amount needed for the home renovation from taxation, in particular from your IRPEF (Imposta sul reddito delle persone fisiche - Tax on personal income).



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Government launched a new fiscal bonus within the ministerial decree called “Decreto Rilancio” (D.L. n. 34 May 2020). The new fiscal mechanism provides a 110% tax deduction of the refurbishment costs in 2020 and 2021⁹. 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. This new fiscal mechanism can open new possibilities for deep home renovations, especially in multi-family houses.

For condominium and urban districts, the Renewable Energy Directive (EU 2018/2001) and the Internal Electricity Market Directive (EU 2019/944) break new ground for consumers by recognising, for the first time under EU law, the rights of citizens and communities to engage directly in the energy sector (Caramizaru & Uihlein, 2020). The directives transposition into national law (D.L. n.162/2019) can boost the creation of such renewable and energy communities, giving a contribution to the national decarbonization process. Italy is defining concrete measures to facilitate the implementation of energy communities, through feed-in-tariffs (FiTs), tax incentives, renewable support schemes, and grants (Curtin et al, 2017), which can also contribute to the built environment renovation.

Italy has also a consolidated set of rules to guide the building sector, such as mandatory minimum standards for technological systems (e.g., heating systems); Energy Performance Certificate for selling and renting houses; high EE standards for new construction and major renovation projects (“Requisiti Minimi” decree, updated every 5 years).

Restructuring activities is a worthy economic sector in Italy, which 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 also increasing (22% of buildings sold in 2018 are in Class A and B). These figures show a dynamic sector that gives high value to energy efficiency.

4. Threats

Despite several incentives, financial barriers are still the main threats for home retrofitting. The difficulties to access credit, the high up-front costs, the long pay-back period (between 5 to 10 years), and the lack of national procedures to split benefits/costs between owners and tenants are the most affecting factors. Homeowners who approach home retrofitting also have to face with complex procedures in order to obtain incentives and fiscal rebates (particularly relevant for the Super bonus 110%).

COVID-19 pandemic and the restriction's measures have strongly affected the families' income, reducing the capacity to afford home renovation works and daily-life costs, for instance, energy bills for electricity and heating. 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.

Besides, COVID-19 pandemic produced several impacts to the building sector. In 2020 IEA estimates a 10% decline in new building construction and retrofit investments, due to shifts in investment patterns. Recovery

⁹ D.L. n.34 2020, approved by the Italian Parliament in 2020. The Superbonus 110% is a 110% tax credit of the expenditure made in order to improve a home's energy efficiency and lower its seismic risk. The bonus can be managed in three ways: 1) use the fiscal bonus of 110% of the expenses incurred as a deduction; 2) use it as an invoice discount applied directly by the suppliers. The client pays the invoice with a discount (up to 100% of the total amount) and the suppliers “buys” the fiscal credit from its client and then use it as a deduction; 3) transfer the tax credit to third parties (such as banks, insurance firms and other organizations). These entities have established an average purchasing price of 100% of these fiscal credits. Furthermore, in some cases, third parties could grant a loan in advance, which they get back with the bonus obtained.



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funds are expected, which can reduce negative impacts and stimulate the sector. Beyond the short-term impact of an economic downturn on construction demand, the COVID-19 pandemic may also influence and change the home concept. Indeed, the long lockdown periods may have changed people consideration of home comfort, indoor air quality, noise pollution, thermal expenditure, etc., which can increase long-term investments in energy efficiency and home renovation.

4.1.2 STAKEHOLDER ANALYSIS

The stakeholder analysis has been developed through a questionnaire submitted to local partners. The questionnaire requires 1) to identify stakeholders according to the categories identified in the literature (if applicable in the target area); 2) to qualify them according to their influence/interest level to the OSS; 3) to identify their role and relationship with the OSS.

In the Padova area partners identified several stakeholders (Table 2), which operate in the territory and may be involved or even shape the future OSS business model.

Type of stakeholder	Padova area list of Stakeholders
Local authority and Regional authority	Municipality of Padova Veneto Region
Chamber of commerce	Chamber of commerce (Camera di commercio di Padova) – Local level https://www.pd.camcom.it/
Public agencies	Regional social Housing agency (ATER) – Provincial level https://www.aterpadova.org/
Building industry (façade, prefabricated elements providers, insulation industry)	Building industry association (ANCE) – Provincial level https://www.ancepadova.it/ Assindustria Veneto Centro (https://www.assindustriavenetocentro.it/)
Manufactories (e.g. door and window providers)	SME association (CNA) – Provincial level https://www.cnapadova.it/ Providers locally based: Serisolar Srl Tekno Point Italia Srl REXPOL Srl Pilkingon Italia Stiferite SpA Weishaupt Italia Spa
Technological products suppliers, e.g., RES plants, heating system providers, ventilations products providers)	No specific references
Home renovation services providers (Carpenters, plumbers, electricians, technological appliances agents)	Confartigianato - Artisans and small businesses (UPA) – Provincial level http://www.upa.padova.it/sp/home-it.3sp
Contractors	COAF Srl Cristoforetti Smart Future srl
Energy advisors, energy certifiers	Professional board (energy certifiers) – Regional level https://venet-energia-edifici.regione.veneto.it/
Utilities	No specific references
Insurance companies	No specific references
Designers, architects, engineers, interior studios	No specific references
Professional boards	Professional boards (architects, engineers, accountants, geologists, agronomists) https://www.ordinearchitetti.pd.it/ https://www.pd.ordineingegneri.it/ http://www.geometri.pd.it/site/ https://www.perindpadova.it/ https://www.odcecpadova.it/ https://www.geologiveneto.it/ http://www.agronomiforestalipadova.it/



Lenders (banks)	Banks providing dedicated credit lines for home retrofitting – National level BANCA ETICA MPS UNICREDIT Intesa San Paolo CREDIT AGRICOLE BNL BANCA SELLA BANCA CARIGE BPER FINDOMESTIC CREDEM Poste Italiane BCC Carige Fineco Generali Unipol
ESCO	INNESCO ASE (AcegasapsAmga) (http://www.aseservizienergetici.it/) AzzeroCO2 (https://www.azzeroco2.it/) – National level
Energy producers	Eneren S.r.l. Galletti Spa FuturaSun srl
NGO and foundations	Green building council Italy (GBC) – National level https://www.gbccitalia.org/
R&D actors	Padova University (http://www.dicea.unipd.it/) http://www.dii.unipd.it/) ITS Red Academy (https://itsred.it/)
Building managers/administrator	National association of Italian municipalities (ANACI Padova) (http://www.anacipadova.it/) – Local level National Union of Building Administrators (UNAI) (https://www.unai.it/veneto) – Regional level
Owners and tenant associations	UPPI Padova (http://uppipadova.it/it/) Confedilizia Padova (https://www.confedilizia.it/) – Local level
Costumers associations	No specific references
Labour Unions	ASPPI Padova (http://www.asppipadova.it/Chi_Siamo.htm) – Local level

Table 2 Type and list of stakeholders – Padova pilot case. “No specific references” – Stakeholders exist and can be engaged, but no specific reference exists. “/” – in the target area the specific stakeholder is not present, or it cannot be engaged.

According to respondents, almost all players identified in the target area lie in the block of high influence and high interest (Figure 2). The most influencing and interested players are local authorities. Building industries, banks and building administrators, both as single professionals and collectives, have a high influence on the retrofit process and moderate-high interest. They detain key resources such as financial sources, technical skills, and the capacity to convince and guide final customers. Chambers of commerce, contractors, and owners/tenant associations are positioned in the same block of the matrix, with moderate-high influence and interest. Building administrator associations and unions have high interest and moderate-high influence. For the OSS business model might be crucial to involve and consult all those players, in order to create a strategic alliance. Companies and professionals who provide energy certifications have instead lower influence but high interest in the OSS. These can find in the OSS a useful means to increase their business and find new potential customers. They should be kept informed about the OSS implementation. Utilities have been not considered in this analysis, but their involvement might be more affected by energy communities development. It is important to keep this player informed in order to increase its participation for projects which aim to implement energy communities. Public agencies, such as social housing agencies, insurance companies and ESCOs have a moderate-high influence on the retrofitting process. These actors should be



managed closely to assure the success of the OSS. Front line services providers (carpenters, plumbers, electricians, technological appliances agents), customer associations, R&D actors and NGOs have a moderate-high interest and lower power in terms of capacity to influence the home retrofitting. Customers associations and R&D actors can assume an important role in advocating the OSS initiative and increase the shared awareness about benefits coming from retrofitting and energy efficiency interventions. Labour unions lie in the moderate low influence/interest block. This would recommend further involvement of such actors in order to increase their interest.

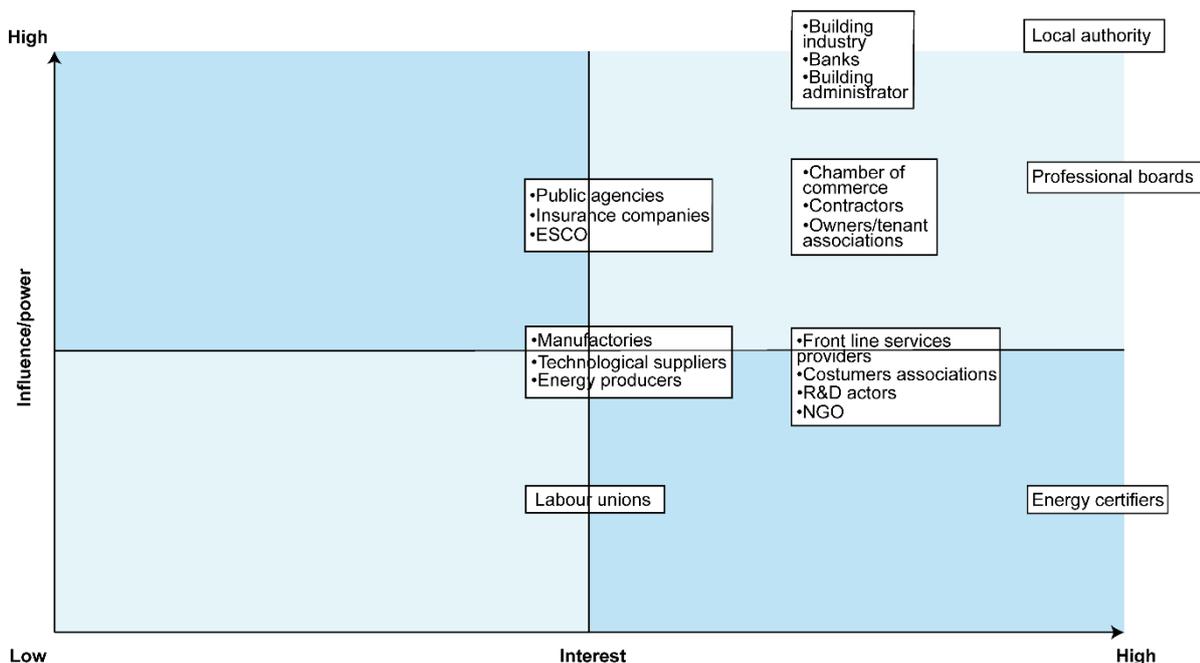


Figure 2 Stakeholder influence/interest Grid – Padova Pilot case

According to responses, the stakeholders’ relationship with the OSS has been identified (Figure 3). Almost all stakeholders which lied in the high influence and interest matrix block are recognized as potential partners, suppliers and investors, especially those with a greater influence level. The role of supporter and customer is mostly performed by players with a high and moderate-high interest level, such as R&D actors and customers associations, public agencies, NGOs, building administrators, etc. Contractors are seen both as suppliers and customers by local partners, which means that the future OSS might provide services also to local players and not only to homeowners and condominiums. In Padova, there are few directly OSS competitors. Players acting as competitors are characterized by a moderate-high influence and lower interest in the OSS implementation, like utilities and ESCOs. Respondents do not identify any blocker in the target area, showing a favourable environment in terms of players’ network.



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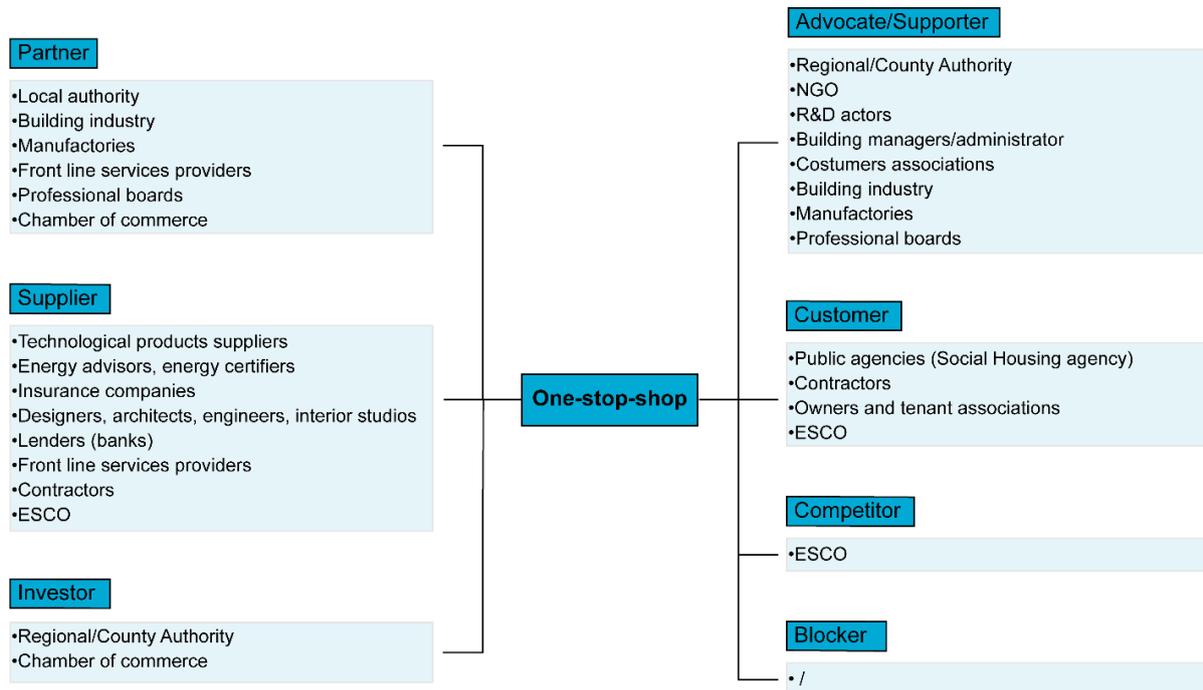


Figure 3 Stakeholder relationship map – Padova pilot case. Partner (a company or organization who closely collaborates with the OSS to provide services); Supplier (a company or organization who provides key services and products to the OSS); Advocate-Supporter (a company or organization who supports the OSS, by publicity, endorsements, providing new customers, etc.); Investor (a company or organization who provides financial resources to the OSS); Customers (final users of the OSS business); Competitor (a company or organization who delivers similar services, which competes within the same market); Blocker (a company or organization who acts as an obstacle to the OSS).

4.2 TIMISOARA PILOT CASE

4.2.1 SWOT ANALYSIS

<p>Built environment</p> <ul style="list-style-type: none"> • High home owner-occupied rate • High percentage of buildings which need refurbishment measures • Potential for high savings through EE rehabilitation due to poor quality of existing condominium buildings • High presence of district heating system (2/3 of the residents are connected to the district heating system - but network pipes require rehabilitation) <p>Institutional framework</p> <ul style="list-style-type: none"> • Local EE programs for residential buildings and SEAP • Building code implementing EE strategies (new buildings - high energy performance required) • Many EU-funded projects related to EE for building and transport sectors, which increase local authority expertise and awareness <p>Economic issues</p> <ul style="list-style-type: none"> • Tax breaks for homeowners performing EE interventions • Local and regional financing programs <p>Home renovation market</p> <ul style="list-style-type: none"> • Presence of training centres providing courses on EE measures, RES production technologies, NZEB design • Low presence of competitor businesses • Extensive presence of building products providers • Extensive network of banks • Strong R&D sectors in local academia and professional organizations 	<p>Built environment</p> <ul style="list-style-type: none"> • Home renovation rate higher for single-family houses than for condominiums <p>Institutional framework</p> <ul style="list-style-type: none"> • Legislative barriers • Low integration between energy strategies and other sectoral policies • Small EE home interventions (window replacements mostly) • Difficulties to access energy data by local authorities • Lack of social housing in the form of public buildings <p>Economic issues</p> <ul style="list-style-type: none"> • Innovative finance instruments less common and used • Lack of volumetric incentives and construction rights rebates <p>Social issues</p> <ul style="list-style-type: none"> • High presence of low-income families and elderly residents • Information barriers (homeowners have high difficulties to access information, especially related to finance and technical instruments) • Low social awareness • EPC not always present in advertisements for selling and renting properties <p>Home renovation market</p> <ul style="list-style-type: none"> • Low diffusion of energy-related technologies and high-cost • Lack of quality assurance/guarantee for services and interventions providers • Lack of specialized/customized technical-financial services for energy retrofiting • Lack of specialized workforce • Undeveloped ESCO market
<p>Built environment</p> <ul style="list-style-type: none"> • High RES potential (Romania has the 3rd highest geothermal potential in EU) • Centralised heating systems upgrading mandatory for condominium built between 1950-1990 <p>Institutional framework</p> <ul style="list-style-type: none"> • High national commitment to EE and climate change • EPC mandatory for new buildings and for home selling/renting <p>Economic issues</p> <ul style="list-style-type: none"> • Possibilities to access loans with a government guarantee for retrofiting projects <p>Social issues</p> <ul style="list-style-type: none"> • High energy performance houses are seen as a status symbol <p>Home renovation market</p> <ul style="list-style-type: none"> • Market growing trend of specialized technical-financial and designing consultancy services • Favourable circumstances for job creation and specialized training programs • Potential for the development of a strong ESCO market 	<p>Institutional framework</p> <ul style="list-style-type: none"> • High complex procedures and bureaucracy (time problems) • Low national commitment to RES production and green energy • Lack of procedures to split costs/benefits between homeowners and tenants • A recent change of financing procedures, which are still not well understood by homeowners <p>Economic issues</p> <ul style="list-style-type: none"> • Fiscal rebate measures less common • Lack of green mortgages • Decreasing of interest and financial capacity due to COVID-19 pandemic • High-interest rate for loans <p>Social issues</p> <ul style="list-style-type: none"> • Distrust national government and national programs • Difficulties to transfer EPC into real market value

Table 3 SWOT matrix – Timisoara pilot case



1. Strengths

The SWOT analysis shows that the most relevant strengths concern the built environment and the institutional situations. 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). 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. 95% of buildings are owner-occupied, representing a potential strength for the OSS implementation. District heating provides a significant percentage of the heating and hot water in urban dwellings and it is often 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.

The municipality of Timisoara shows a high commitment to energy efficiency and climate change mitigations. The Local Council approved the Strategic Plan called "Program for Improving the Energy Efficiency for the Municipality of Timisoara" in 2018, concerning only public buildings (headquarters, educational and health buildings). For the building sectors, Timisoara has approved in 2010 the Sustainable Energy Action Plan, promoted by the Covenant of Mayors, plus 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. Timisoara was also 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 (Rugina & Lazar, 2012). Timisoara already experiments tax breaks solutions for home renovation, which innovate financial mechanisms in the target area. Public financial instruments have been changed in the last years, reducing the amount of public budget. The City Council provides tax breaks for seven years for homeowners who perform rehabilitation and thermal insulation works. 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. The local building code integrates energy strategies in terms of minimum energy performance compliance for new buildings, following the National Law 372/2005. 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 participation of the municipality at EU funded projects concerning energy reduction and efficiency increase the experience and internal skills of the authority. Those create a favourable environment for launching innovative businesses like the OSS.

In terms of home renovation market, the analysis conducted shows a stimulating environment, with training centres providing courses on EE measures, RES production technologies, NZEB design and the presences of many companies working within the home renovation chain. Those elements may represent a good opportunity to get over the lack of a specialized workforce.



2. Weakness

The most relevant weaknesses concern economic and social barriers. Since 2005 in Romania several policies and financial programs supported homeowners in refurbishing their houses, but still many difficulties persist, in particular regarding the lack of information and awareness. Homeowners have high difficulties to access information, especially related to finance and technical instruments. The difficulties in accessing information are also due to a recent change in terms of public financing mechanisms. Before, home renovation costs were covered by public grants come from National and Local funds, and in part from EU funds and owners' associations (around the 20% of the entire cost). The changing in the financial mechanism occurred in the last years, requires now higher efforts in terms of private investments. The huge share of families with low-income negatively affects the investments in home renovation. Fiscal rebates are less used, as well as private investments. Construction rights rebates and volumetric incentives for new buildings or major renovations are not available in the country, bringing to a reduction in construction investments, which will be crucial to overcoming the crisis enforced by the COVID-19 pandemic. The energy efficiency has low effects and impact on decisions in terms of home purchasing and renting, which further impact the construction sector.

Energy-related interventions focus mostly on small interventions (windows replacements). Sometimes these interventions are carried on without permission. Deep home renovation, linking wall and roof isolations to heating systems replacement are less common in Romania. In general, it is possible to estimate that the renovation process is higher for single-family houses than for condominiums, due to fewer efforts in terms of economic expenditure and decision-making process. The low social awareness affects the interest of homeowners to start a home renovation, especially when it requires the participation of all homeowners in a condominium. The lack of data at the local level also reduces the shared awareness and capacity to identify priorities and opportunities. Indeed, few data are available at the local level regarding energy consumption and local energy sources, as well as home renovation rate at the municipal level. 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.

A relevant weakness in the target area is the lack of guarantee both in terms of technical and financial services. This strongly affects the home renovation, reducing the certain to reach a high-performance level after work and the interest of banks to facilitate the access to credits.

3. Opportunities

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 and sets up strictly energy requirements for centralised heating systems, new building and major renovation works. Indeed, the home renovation rate has increased in the last years, thanks to the high amount of public funds made available, covering almost the whole costs of renovation works. 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



2.3 SWOT ANALYSIS

perceived risks, especially to medium and low-income families, like in Romania. This increases the public attention on home retrofitting benefits and opportunities, creating a favourable situation for the OSS establishment in terms of users' interest, which are now discouraged due to the reduction of public efforts in terms of available budget. The financial mechanism change also opens new possibilities for business within the home renovation chain, especially for whom provide technical and financial services, like ESCOs.

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 it is rarely indicated in advertisements. The analysis shows 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.

4. Threats

The most relevant threats refer to institutional, economic, and social issues. These are strongly affected by the recent change in the financial mechanism. The decrease of the national financial capacity brought to reduce the public investment in home renovation and to modify the financial mechanism. The change increased the difficulties to access public incentives and calls for higher involvement of local authorities. It also increases the difficulties in gaining grants and makes the process more complex for homeowners, with long waiting time procedures. A transition period is needed to increase the appeal of new solutions, like tax rebates. Despite the availability of loans with a government guarantee, difficulties in accessing credit are still high for homeowners, due to the high-interest rate. Few financial measures exist for low-income families, which are increasing in number as a result of the COVID-19 pandemic. The economic crisis strongly affects the building sector, reducing the family financial capacity and the interest in home retrofitting.

The lack of a strong national strategy to sustain the green energy production brings to a low diffusion of all RES production systems (solar thermal panels, heat pumps, biomass systems, and cogeneration systems). Price for innovative technologies for RES production and storing is still not affordable for many families and there are few incentives to support the purchasing. The technologies with a higher diffusion are condensing boilers, PV panels and 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). The wide share of district heating systems makes the stay-alone RES technologies less attractive for homeowners.

In conclusion, a shared distrust to the public bodies and public programs represents a strong threat for the future OSS, which should overcome this barrier by assuring quality and support to homeowners. The lack of trust can affect the OSS implementation, especially when it would be provided by a public body. It should be taken into consideration for the OSS business model design.



4.2.2 STAKEHOLDER ANALYSIS

Type of stakeholder	Timisoara area list of Stakeholders
Local authority	Municipality of Timisoara (www.primariatm.ro) – Local level
Regional authority	Timis County Council (www.citimis.ro) – County level
Public agencies	Environmental Protection Agency (http://apmtm.anpm.ro/), The State Inspectorate for Construction (https://www.isc.gov.ro/judet_TM.html) – National level
Building industry (façade, prefabricated elements providers, insulation industry)	Arabesque (https://mathaus.ro/), Bilka (https://www.bilka.ro/), Dedeman (https://www.dedeman.ro/) – County Level
Manufactories (e.g. door and window providers)	Mondo style (http://www.mondo-style.com/), Fink Fenster (https://fink-fenster.ro/index.php/ro/), Nicomi (http://www.nicomi.ro/en/) – Local level
Technological products suppliers, e.g. RES plants, heating system providers, ventilations products providers)	Viessman (https://www.viessmann.ro/), Junkers – County Level
Home renovation services providers (Carpenters, plumbers, electricians, technological appliances agents)	Romstal (https://www.romstal.ro/), Conseletrificarea Instal (https://www.cei.ro/) – Local level
Contractors	Constructim SA (https://www.constructim.ro/), Sulfatim SRL (http://www.sulfatim.ro/), Canova CCM (https://canova.ro/) – County Level
Energy advisors, energy certifiers	Romanian Energy Auditors Association (https://aaecr.ro/) – National level
Utilities	Colterm (https://www.colterm.ro/), Enel (https://www.enel.ro/enel-energie/ro.html), E-on Gaz (https://www.eon.ro/) – National level
Insurance companies	Allianz-Tiriac (https://www.allianztiriac.ro/RO/persoane-fizice.html), Generali (https://www.generali.ro/) – National level
Designers, architects, engineers, interior studios	Studio ARCA SRL (https://www.studioarca.ro/), Tectonics ART SRL (http://www.tectonics.ro/), Pro Design S&S&M SRL – County Level
Professional boards	The Romanian Association of Installation Engineers (https://www.aiiro.ro/), The Romanian Order of Architects – National level (https://oar.archi/)
Lenders (banks)	BRD Groupe Societe Generale (https://www.brd.ro/), ING Groep (https://ing.ro/persoane-fizice), Intesa Sanpaolo (https://www.intesasanpaolobank.ro/), Alpha Bank (https://www.alphabank.ro/) – National level
ESCO	/
Energy producers	Hidroelectrica (https://www.hidroelectrica.ro/), Nuclearelectrica (https://www.nuclearelectrica.ro/), OMV Petrom (https://www.omvpetrom.com/ro) – National level
NGO and foundations	National Center for Sustainable Production and Consumption (https://www.cnpcd.ro/), The Romanian Sustainable Energy Cluster (https://rosenc.ro/), The Agency for Energy Efficiency and Environmental Protection (https://managenergy.ro/), ESCOROM (https://escorom.ro/) – National level
R&D actors	The Polytechnic University of Timisoara (https://www.upt.ro/), West University of Timisoara (https://www.uvt.ro/ro/) – National level
Building managers/administrator	No specific references
Owners and tenant associations	The Lodgers' Associations Federation in Timisoara (http://www.falt.ro/) – Local level
Costumers associations	National Authority for Consumer Protection (https://anpc.ro/) – National level
Labour Unions	FGS Familia – Labour union in the field of constructions (www.fgs.ro) – National level



2.3 SWOT ANALYSIS

Table 4 Type and list of stakeholders – Timisoara pilot case. “No specific references” – Stakeholders exist and can be engaged, but no specific reference exists. “/” – in the target area the specific stakeholder is not present, or it cannot be engaged.

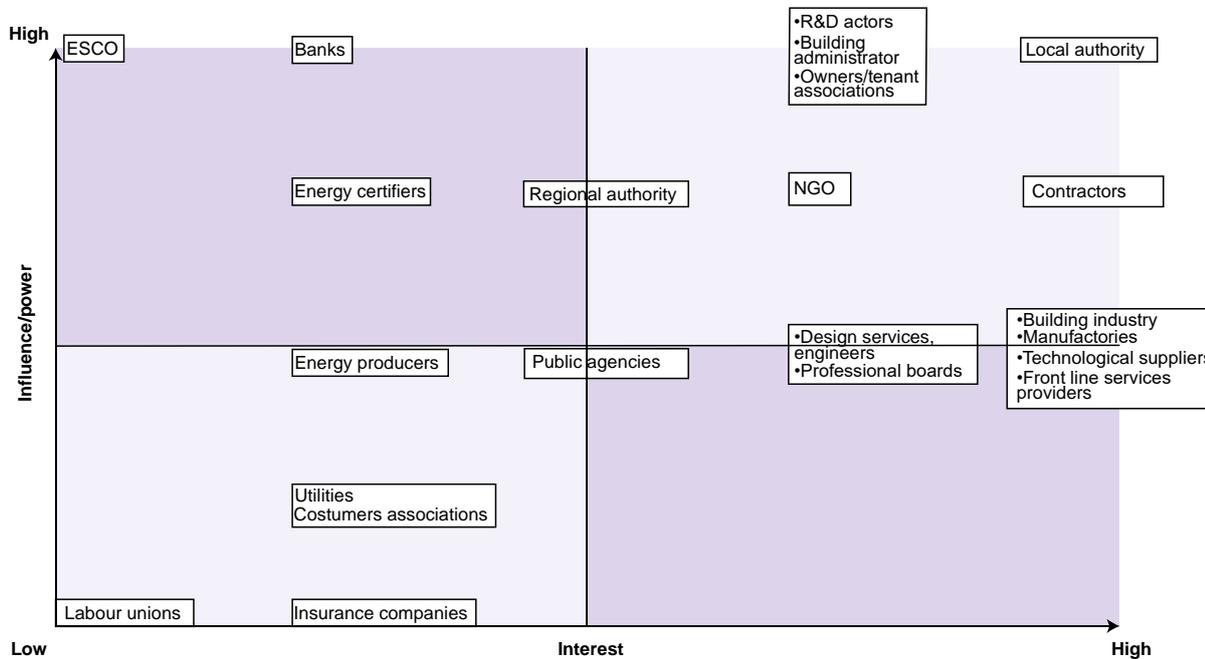


Figure 4 Stakeholder influence/interest Grid – Timisoara Pilot case

The stakeholder influence/interest analysis (figure 4) shows a moderate-high mismatch concerning the influence and interest level of stakeholders in the target area. ESCOs, banks, energy certifiers and regional authority have a high level of influence and low interest. These stakeholders should be kept satisfied and engaged closely in order to increase their interest, especially for banks, which can play a key role to overcome economic barriers. Building industries, manufactories, technological suppliers, and front-line services providers have high interest but lower influence. These stakeholders can find a worthy ally in the future OSS, which can play an intermediary role between users and suppliers. Local authority like in the Padova area lies in the high influence/interest block. In the same block, there are R&D actors, building administrators, owners/tenants associations, NGO and contractors. These stakeholders should be engaged and consult when designing the OSS business model. At the opposite side of the grid, labour unions, insurance companies, utilities, consumer associations and energy producers lie in the low influence/interest block. These stakeholders should be kept monitored in order to increase their interest concerning the OSS.

The questionnaire submitted to local partners also asked them to identify per each stakeholder a potential role related to the OSS (figure 5). The respondents identify as partners local and regional authorities, and R&D actors, like universities and research centres. These stakeholders have high interest and influence within the home renovation process (figure 4). The results suggest that future OSS may have a public nature, providing mainly support to final users in terms of accessing information and applying for grants and subsidies. Future OSS can also have an important role in providing intermediary services. Indeed, respondents identify as suppliers all stakeholders directly involved in the home renovation work, like contractors, building industries, manufactories, technological products suppliers, front line services suppliers, energy certifiers, designers and engineers, insurance companies, utilities and energy providers. Those stakeholders can find advantages in the OSS creations, in terms of gathering new customers and enlarging their business. The presence of



2.3 SWOT ANALYSIS

training centres providing specialized courses on EE measures, RES production technologies, and NZEB design (table 3) can increase the capacity to these stakeholders in delivering high-quality work and services. Indeed, figure 4 shows how they have a high interest in the OSS. The identification of professional boards as a competitor, suggests a strategic role for the OSS in training actors who provide services and products for the home renovation. From the SWOT (table 3) emerges that the lack of trust to home renovation workers is a relevant weakness. The future OSS may operate as an intermediary point between demand and offer, assuring quality and high skills of workers in order to overcome the weaknesses that emerged in the SWOT. The role of customers is assigned to building managers/administrators and homeowners and tenants. Respondents identify as investors banks and ESCOs. This suggests that the OSS would also provide direct financial services with the support of those actors. However, the low interest of them (figure 4), ask for moderate-high efforts in order to engage banks and ESCOs and increase their interest in the OSS.

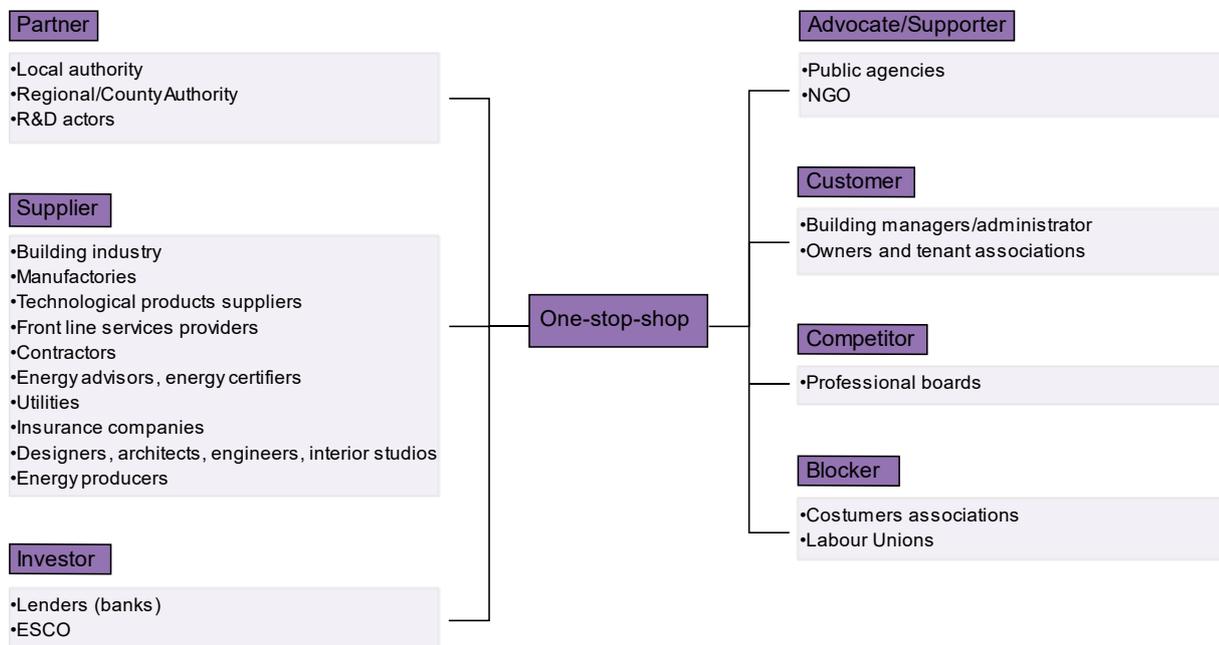


Figure 5 Stakeholder relationship map – Timisoara Pilot case. Partner (a company or organization who closely collaborates with the OSS to provide services); Supplier (a company or organization who provides key services and products to the OSS); Advocate-Supporter (a company or organization who supports the OSS, by publicity, endorsements, providing new customers, etc.); Investor (a company or organization who provides financial resources to the OSS); Customers (final users of the OSS business); Competitor (a company or organization who delivers similar services, which competes within the same market); Blocker (a company or organization who acts as an obstacle to the OSS).

4.3 VIDIN AND SMOLYAN PILOT CASES

4.3.1 SWOT ANALYSIS

<p>Built environment</p> <ul style="list-style-type: none"> 85% of buildings are single family residential houses 52% of residential buildings were built between 1960-1989 High potential for energy savings in old panel multi-family buildings Need for home renovation (both energy-related and structural safety) <p>Institutional framework</p> <ul style="list-style-type: none"> High level of local commitment related to EE (Local programs in Vidin – SEAP in Smolyan) The national energy and climate policies are in the context of the European legislation and thus aiming to ensure affordable energy for all consumers Experience of the municipalities in the process of residential buildings renovation High integration between energy strategies and sectoral policies Presence of building codes requiring minimum energy performance for buildings (Class C/B) <p>Social issues</p> <ul style="list-style-type: none"> High home owner-occupied rate <p>Home renovation market</p> <ul style="list-style-type: none"> Building management companies increasing in relevance Low presence of direct competitors 	<p>Built environment</p> <ul style="list-style-type: none"> Only 7% of residential buildings meet EE minimum requirements Lack of energy grids (district heating and gas supply) in Vidin and Smolyan <p>Institutional framework</p> <ul style="list-style-type: none"> Lack of volumetric incentives and construction rights rebates Buildings are eligible for public funds after the establishment of Homeowners Associations (HOAs) (Condominium Management Act, 2009) Lack of quality guarantee and monitoring instruments Energy data available only for public buildings <p>Economic issues</p> <ul style="list-style-type: none"> Lack of attainable financial support (especially for single homeowners) High presence of low-income families High percentage of households using solid fuels for heating Lack of penetration of third-party financing mechanisms (provide by ESCOs mainly) <p>Social issues</p> <ul style="list-style-type: none"> Information barriers Low EE benefits awareness Lack of homeowners' trust both to HOAs and services providers <p>Home renovation market</p> <ul style="list-style-type: none"> Low diffusion of energy-related technologies Low investments in RES production Lack of competition on the EE services market
<p>O</p> <p>Institutional framework</p> <ul style="list-style-type: none"> High national commitment related to EE and climate change National strategy for home renovation according to trigger points Advanced EE requirements for new buildings <p>Economic issues</p> <ul style="list-style-type: none"> National and regional funds supporting home retrofitting interventions National funds mostly address multi-family buildings Presence of fiscal rebates instruments <p>Social issues</p> <ul style="list-style-type: none"> Building energy performance increases in relevance for purchasing houses (especially for higher-income groups and in urban areas) 	<p>T</p> <p>Built environment</p> <ul style="list-style-type: none"> High home vacancy rate (30% at the national level) <p>Institutional framework</p> <ul style="list-style-type: none"> Complex procedures and bureaucracy for obtaining funds EPC is not mandatory for selling and renting homes <p>Economic issues</p> <ul style="list-style-type: none"> Low access to credit and high interest-rate for loans Fiscal rebate measures less common Lack of specific measures for low-medium income families and ethnic minorities who live in low-quality houses Decreasing of financial capacity due to COVID-19 pandemic - Rising unemployment and decreasing of household's incomes Low public financing capacity Recent change in financing procedures, which are still not well understood by homeowners <p>Social issues</p> <ul style="list-style-type: none"> High level of non-payment of fees (energy bills) <p>Home renovation market</p> <ul style="list-style-type: none"> The companies providing energy efficiency services rely on public procurement - difficulties in reaching citizens Homeowners expect 100% public grant – low interest in investing in home renovation by themselves

Table 5 SWOT matrix – Vidin and Smolyan pilot cases



5. Strengths

85% of residential buildings in Bulgaria are single-family houses. Multi-family residential buildings are less than 5% of the total, but those approximately cover the same area of single-family houses. The potential for energy savings of old panel multi-family buildings is very high. 52% of residential buildings in Bulgaria were built between 1960-1989. For the municipalities of Vidin and Smolyan is around 80% (National Census, 2011). This is a typical situation occurring in east European cities, with many buildings in the same quality status and with the same structural and energetic performances. For the OSS it might represent strength in terms of standardised service packages design.

97.6% of the housing stock is privately owned (National Census, 2011). Bulgarians have a deep aspiration for possessing their dwelling, and only a small percentage rents a house at market price (14.6% of Bulgarians live in a dwelling unit free of charge, Eurostat, 2018).

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, most of them offer 100% funds for home renovation. Two are the main programs supporting home retrofitting: the NEEP¹⁰ and the Regions in Growth¹¹.

At the local level, there is high integration and coherence between policies and public instruments. Both cities set an Urban Master Plan incorporating energy efficiency strategy, as well as a Building code which integrates minimum energy requirements for new buildings. The local Building code requires the achievement of Class C as a minimum energy 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. Furthermore, the Municipal Energy strategy with the 2050 horizon is under development.

Smolyan and Vidin municipalities have a long experience in residential buildings renovation. During the implementation of the NEEP program, municipalities were responsible for preparing financing applications and signing contracts with contractors and suppliers. They also provided supervision on energy and structural audits, construction permits, works execution, and after-work building certifications. Supervision is done in accordance with the Bulgarian Public Procurement Act. In Smolyan 41 multi-family residential buildings have been renovated (29 by the NEEP program, and 12 by the Operational Programme “Regions in Growth”), in Vidin 26 residential buildings (14 by the NEEP program, and 13 by the Operational Programme “Regions in Growth”).

There are few potential competitors in the two target areas, according to local partners (see section 4.3.2). 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, which businesses are not in competition with the OSS.

¹⁰ National Program for Energy Efficiency in Residential Buildings (NEEP) <https://www.mrrb.bg/en/energy-efficiency/energy-renovation-of-bulgarian-homes/>

¹¹ The Region in Growth program is financed by the European Structural Fund and focuses on regional development https://www.euro-access.eu/programm/regions_in_growth_bulgaria



6. Weakness

In Bulgaria, only 7% of residential buildings meet minimum energy efficiency requirements. One of the main problems in the two municipalities is the lack of energy grids (district heating and gas supply). Households in Vidin and Smolyan use mainly wood and coal for heating. This, in combination with relatively low electricity prices, decreases the willing of home retrofitting and leads to an extension of investments return, which may exceed the life-cycle of interventions.

In Bulgaria, as well as in the other two target area, the main weaknesses refer to difficulties in accessing information concerning technical and financial instruments. Difficulties in accessing information affect both homeowners and private actors. This also includes a general low understanding of financing programs and difficulties in preparing application documents in order to obtain public funds. Homeowners are not aware of the benefits linked to energy efficiency interventions both in terms of increasing comfort and property value. The decision on which technical measure implement depends mainly on economic issues.

Economic issues and the lack of attainable financial support for home retrofitting are also crucial. A large proportion of the population is unable to afford basic home maintenance. 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). Access to credit is limited and few banks offer products for people with low incomes due to their higher risk profile. Third-party financing mechanisms, as Energy performance contract model and On-bill financing model, are less common and attractive for homeowners in Bulgaria.

According to the Condominium Management Act (2009), multifamily buildings are eligible for public funds after the establishment of Homeowners Associations (HOAs) as legal bodies. The Condominium Law obliges HOAs to maintain buildings and facilitate large scale energy-efficient renovations. The Law sets this as a voluntary option along with the existing form of Owners Assembly. Despite Building management companies and HOAs are increasing in relevance, the main social barrier is the lack of trust. 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 et al, 2018). The lack of mandatory monitoring instruments further increase the distrust perceived by homeowners. The low-skilled workers further decrease the attractiveness of home renovation. Overcome these barriers would be crucial for the success of the OSS.

The diffusion rate of new technologies and RES production is moderate-low in the target cities. Even if different policies and programs have been developed in the last decade, 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. The two technology systems with a high diffusion are the heat pumps and biomass systems, mainly used for the private home heating in Smolyan and Vidin, followed by PV panels and solar thermal systems. The need to change the energy production in order to meet European and National climate goals increase the relevance of the OSS, which would boost and carry on the energy turn.

7. Opportunities

Since 2007, the national government has implemented several energy-efficiency programs and policies for residential buildings, which count financial measures, performance requirements and fixed standers for new building and major home renovation. The minimal requirements for thermal insulation have been introduced since 1964, followed by mandatory periodical energy efficiency inspections for heating systems in private and public buildings. The requirements are applied to all new buildings. Furthermore, all new buildings built after



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2020 shall meet the NZEB requirements according to the Bulgarian the Energy Efficiency Act (2015). The regulatory framework opens many opportunities for the OSS launch in terms of capacity to deliver renovation works, assuring quality, and providing advisory services.

Public grants and funds are the main financial instruments in Bulgaria. The public financing programs covering 100% of the home renovation works had wide success (NEEP, 2012-2017; the Regions in Growth, 2014-2020). The 100% public grant in force until 2017 hindered the establishment of innovative finance instruments. However, the decreasing of public financial capacity makes the 100% supporting mechanism less suitable. New financing measures are now available, such as fiscal rebates, 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, especially in terms of social acceptance. The OSS should play a key role in fostering these financial mechanisms and make them more appealing and accessible to homeowners.

Building energy performance is not the most influencing aspect of buying a house in Bulgaria. Price, location, and comfort are more significant aspects (Volt et al, 2018). However, the energy efficiency growing in relevance in the last years, especially for higher-income groups and in urban areas, where the housing demand is increasing. This can increase the success chances for the OSS.

8. Threats

The most relevant threats are associated with economic barriers. The limited access to credit, especially for low-income families and ethnic minorities, and the intensifying of economic crisis as a consequence of the COVID-19 pandemic, strongly reduce the willing of starting a renovation work. In Bulgaria, reduced interest loans are not available, and 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 or hinder the renovation process, especially without specific policies focus on reducing the interest rate and improve access to credit. The COVID-pandemic brings to a high level of uncertainty, especially among countries in economic difficulties. The McKinsey Global Institute (May 2020) suggests that economic activity could be back on track by early 2021 if the virus is contained within the next months and the right economic policies are enacted. However, longer-term lockdowns and other severe restrictions result in a severe economic downturn, with economic activity returning to 2019 levels by 2023 at the earliest¹². Loss of income and lack of consumer confidence negatively affect demand for housing construction or refurbishment. Energy poverty and the increment of low-income families make the renovation less affordable without public supports and incentives.

Despite, there are more housing units than the number of households, over 40% of households live in overcrowded conditions, and at the same time, the housing vacancy rate is high, around 30% at the national level (Worlds Bank, 2017). The vacancy rate also affects the consensus among homeowners to participate in home renovation in multi-family buildings, increasing uncertainty and economic risks. Lack of guarantee, economic barriers, high uncertainty, and insolvency both compromise homeowners and suppliers, which prefer to provide services to public bodies who are less risky. Those factors badly affect the shared interest in starting or investing in home renovation and energy efficiency improvements.

¹² <https://www.mckinsey.com/business-functions/operations/our-insights/how-construction-can-emerge-stronger-after-coronavirus#>



4.3.2 STAKEHOLDER ANALYSIS

In the two target cities, there are many potential stakeholders to engage in the OSS business creation (Table 4), both operating at the local, regional, and national level. The development of a strategic plan for the OSS implementation may confirm this network, acting as a catalyst to effectively engage players and involve them in a future OSS.

Type of stakeholder	Vidin and Smolyan list of Stakeholders
Local authority and Regional authority	Municipality Vidin (https://www.vidin.bg), Municipality Smolyan (https://www.smolyan.bg)
Regional/County authority	Ministry of regional development and public works (https://www.mrrb.bg)
Public agencies	Sustainable Energy Development Agency (https://www.seea.government.bg/bg)
Building industry (façade, prefabricated elements providers, insulation industry)	Bigla 3 (Construction and Renovation of buildings) – Local level (https://www.bigla3.com)
Manufactories (e.g. door and window providers)	Eridan M – Local level (http://eridan-m.com)
Technological products suppliers, e.g. RES plants, heating system providers, ventilations products providers)	Jterm (heating system provider) – Local level (https://jterm.bg)
Home renovation services providers (Carpenters, plumbers, electricians, technological appliances agents)	Besalev – Local level
Contractors	Vasil Stavrev (compliance assessments of the investment projects and construction supervision if required) – Regional Level
Energy advisors, energy certifiers	Natashka Nikolova – Regional Level
Utilities	CEZ- Vidin (https://www.cez.bg) EVN- Smolyan – Local level (https://www.evn.bg)
Insurance companies	UNIQA Insurance plc (company offers all forms of property insurance) – Local level (https://www.uniqa.bg)
Designers, architects, engineers, interior studios	Konglomeratstroi – Local level (https://www.konglomeratstroi.com)
Professional boards	Chamber of engineers Vidin – Local level (http://www.kiip.bg/vidin)
Lenders (banks)	Bulgarian Development Bank – National Level (https://bbr.bg)
ESCO	CEZ ESCO BULGARIA – National Level (https://cez-esco.bg/en/home)
Energy producers	EVN Bulgaria CHP – Regional Level (https://www.evn.bg)
NGO and foundations	Energy Agency of Plovdiv – National Level (https://www.eap-save.eu)
R&D actors	Technical university – National Level (https://www.tu-plovdiv.bg/en)
Building managers/administrator	Kantora Domoupravitel BG – National Level (http://kantoradomoupravitel.bg)
Owners and tenant associations	Homeowners associations – Local level (https://adues.bg)
Costumers associations	Commission for Costumers Protection – National Level (https://kzp.bg)
Labour Unions	Federation of Independent Construction Unions – National Level

Table 6 Type and list of stakeholders – Vidin and Smolyan pilot cases.

The questionnaire results show local stakeholder arranged along the line which goes from low influence/interest to high influence/interest (Figure 4), with almost all of them located in those two opposite points. Public authorities and agencies are placed in the high influence/interest area. In the same position are



placed also private organizations and companies operating within the home renovation market, like building industries, designers, manufactories, energy certifiers and professional boards. Owners and tenant association also seem to have high influence and interest to the OSS. Those stakeholders should be taken in high consideration for the OSS business model design. Contractors, building managers/administrators, and customers associations lie in the moderate-high influence/interest area. It is interesting for the Bulgarian situation the role played by the Building administration companies, according to the national Condominium Management Act (2009).

At the opposite side, in the low influence/interest area, are placed R&D actors, energy producers, insurance companies, labour unions, technological products suppliers and ESCOs. The results are in line with the SWOT analysis results, which show as weaknesses and threats the lack of quality guarantee, low investments in RES plants and diffusion of energy-related technologies, low presence of ESCOs and diffusion of third-party financial mechanisms. The presence of energy producers in this block would appear in conflicts with what emerges from the SWOT. The high presence of energy unpaid bills, the high percentage of residential buildings with private woodstoves and biomass stoves, should call for a high interest of energy providers who can receive benefits from home retrofitting and house renovation in terms of gain new customers. Perhaps the public or subsidiary nature of energy providers in Bulgaria make their interest in opening new markets less relevant. For the OSS future business model would be important to monitor those actors, especially those who can get benefits from the OSS setting up, like energy companies, insurance companies and ESCOs. Respondents located the banks at the average point of the influence/interest grid. The 100% public financial mechanism in force until 2017, the difficulties for banks to concede loans to low-income families, the high risk of home renovation investments due to low quality and long-time of investment return, hinder the interest of banks. The OSS business model design should consider those barriers in order to make the home renovation a secure and appealing investment for homeowners, suppliers and also banks.

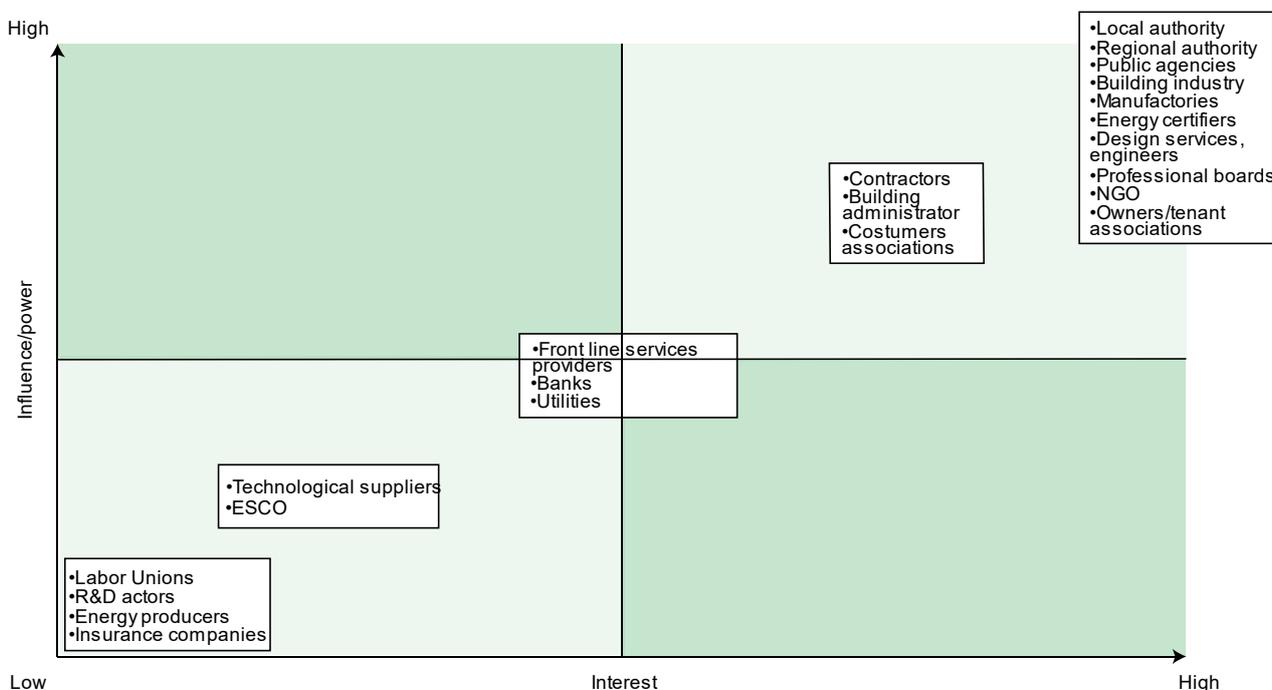


Figure 6 Stakeholder influence/interest Grid – Vidin and Smolyan Pilot cases



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The questionnaire asked local partners to organize stakeholders according to their potential relationship with the OSS, between Partners, Suppliers, Investors, Supporters, Customers, Competitors, Blockers. Respondents attributed to stakeholders with high influence/interest rate the role of potential partners. This is particularly evident for local authorities and public agencies at different scales of competence. The relevance of public bodies is confirmed by assigning to regional/county authorities, utilities, and energy producers (most of the time public or subsidiary companies) the potential role of investors. The results suggest for the future OSS a public nature. Designers, energy certifiers, and contractors are also identified as potential OSS partners. This may suggest that the OSS would play an important role at the first stage of the home retrofitting process. Respondents identified the stakeholder involved in the implementation of home renovation as potential suppliers, such as building industries, manufactories, front line services suppliers, technological products suppliers. The banks can also play a role in supplying services to the OSS. The OSS guarantee can reduce the difficulties in accessing credit for homeowners and decrease the hesitation to concede loans for home renovation works. Respondents identified many potential supporters, such as labour unions, NGO, R&D actors, professional boards. It is interesting the role attributed by respondents to building managers/administrators. This is in line with the SWOT results, which show a high level of distrust to HOAs and building administrators in general from the homeowner's side. Respondents also do not identify competitors and blockers, which show a favourable environment for the setup and launch of the OSS.

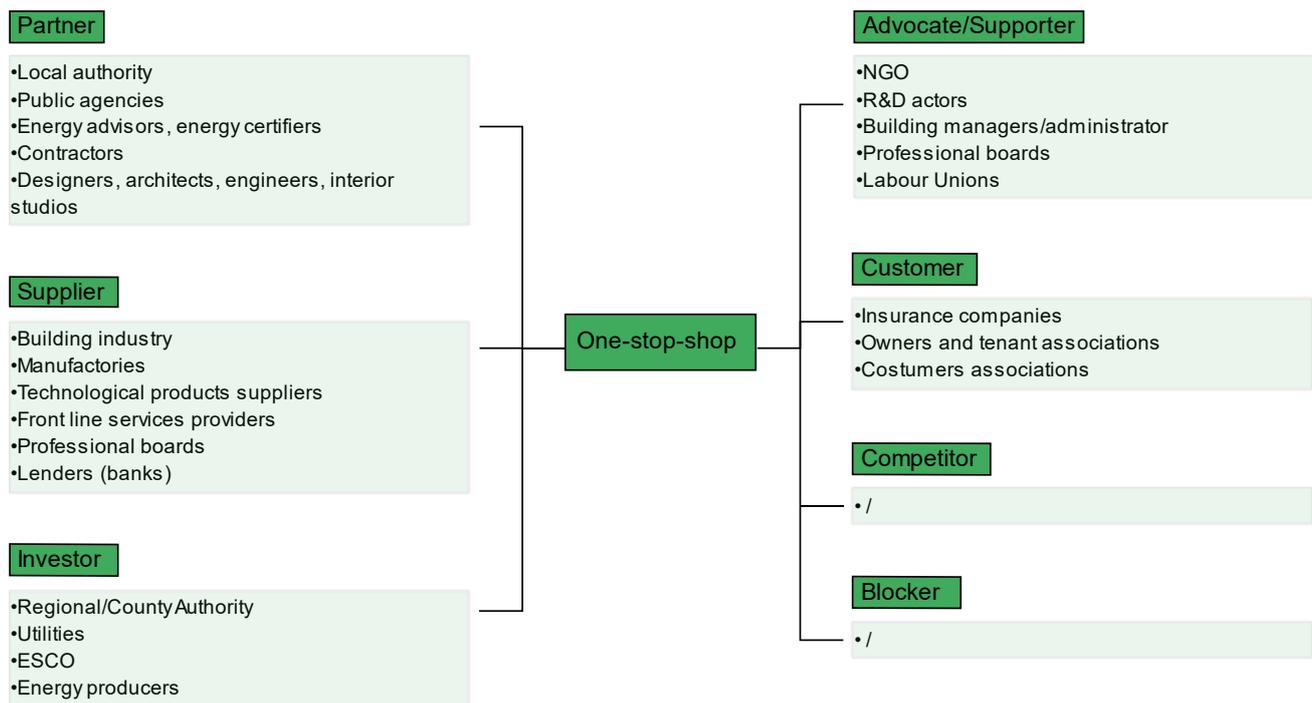


Figure 7 Stakeholder relationship map – Vidin and Smolyan Pilot cases. Partner (a company or organization who closely collaborates with the OSS to provide services); Supplier (a company or organization who provides key services and products to the OSS); Advocate-Supporter (a company or organization who supports the OSS, by publicity, endorsements, providing new customers, etc.); Investor (a company or organization who provides financial resources to the OSS); Customers (final users of the OSS business); Competitor (a company or organization who delivers similar services, which competes within the same market); Blocker (a company or organization who acts as an obstacle to the OSS).

5. CONCLUSION

The SWOT aims to identify strengths, weaknesses, opportunities, and threats which characterize a specific territorial context. 3 SWOT analyses have been developed, one per each target area (Padova, IT, Timisoara, RM, Vidin and Smolyan, BG). The SWOT provides information needed to develop the OSS business model, which should be designed to overcome weaknesses and threats and take advantage of strengths and opportunities. The information refers on one side to climatic issues, building characteristics (e.g., state and age of the building stocks), families' financial capacity; and on the other side data refers to institutional, social, behavioural, and technological issues, which can directly or indirectly affect the OSS marketplace and shape the future business model. Information has been collected through questionnaires, bilateral meetings with local partners and literature review.

According to the literature (Mahapatra et al., 2013; Bertoldi & Boza-Kiss, 2018; Pardo-Bosch et al, 2019; Hunkin & Krell, 2019; Laffont-Eloire et al., 2020), one of the main barriers in the home renovation process is the fragmentation of the market, which is characterized by multiple technical and non-technical players which influence the process and increase the effort needed to engage all of them, both in terms of trust and quality assurance. Thus, it is crucial to identify all stakeholders involved in the renovation process and assess their interaction, influence and interest to the OSS, in order to better design the business model and take advantages from the existing network of players. The stakeholder analysis aims to develop a strategic view of private and public players and the relationships between them. Information has been collected through a questionnaire submitted to local partners. The stakeholder analysis is made up by three steps: 1) Stakeholders identification, 2) Stakeholders categorization (power/interest analysis), 3) Stakeholders mapping (role of stakeholders and their relationship with the OSS).

The SWOT analyses show some similarities between the three target areas. The most relevant strengths concern the built environment and the institutional framework. In the target areas, the majority of buildings are owner-occupied. This represents an advantage also due to the lack of specific measures to split costs and benefits between owners and tenants. The presence of many buildings with a moderate low energy performance shows a broad market potential for businesses focuses on the home renovation. The local authorities in the target areas are also characterised by high commitment in terms of energy turn and climate change, whit specific policies aimed to reduce energy consumption and increase RES production. This is confirmed by the high influence/interest level assigned to local and regional authorities in the three target areas. Local and regional authorities are seen as potential partners and investors for the future OSSs in the



target areas, suggesting a public nature and shape for the businesses. The low presence of direct competitors for the OSS in the target areas can also represent a favourable condition for the launch of the OSS.

The main weaknesses identified in the target areas refer to social and economic issues, and to home renovation market characteristics. The information gap, the lack of trust, the low awareness, and the long decision-making processes in multi-owner houses are the most reoccurring barriers. These suggest a key role for the OSS in facilitating information access to homeowners, in providing quality guarantee, as well as in reducing conflicts between homeowners during the decision-making process. The second main barrier concern economic issues, like difficulties in accessing credit, high-interest rate for loans, and the lack of third-party financing mechanisms (provided by private actors). In Italy, the 110% fiscal bonus and the option to transfer the tax deduction to third parties represent good solutions to reduce economic barriers, but the complexity of procedures increases the information gap. From the analyses emerge the need to closely engage financial actors (banks, ESCOs, foundations, etc.) in order to overcome economic problems and assuring innovative financial services to homeowners. The last main weakness is related to the home renovation market. It is highly fragmented in the three target areas, displaying a conflictual and complex environment, with many players working alone in a competitive way. This increases the efforts required to homeowners in order to find and engage all professionals. This suggests for the OSS a potential intermediary role with the aim to facilitate the interaction between homeowners and professional/suppliers, on one side, and increase the quality guarantee, from the other side. The difficulties in engaging professionals also bring to a reduction in terms of deep renovation. Indeed, in the three target areas, the home renovation is characterised by small interventions (windows insulation, and heating systems replacement mainly).

The main relevant opportunities refer to institutional framework and economic issues. Many policies and measures in the target areas set minimum requirements for new constructions and major home renovation, as well as fixed standards and mandatory compliance for technological systems (e.g., heating systems). The energy performance certification (EPC) for selling and renting houses is mandatory in Italy and Romania. These factors strongly contribute to boost the home renovation process and represent a good opportunity for the OSS implementation. Several economic measures, like grants, subsidies, incentives, tax deductions, are available in the target areas. In Romania and Bulgaria, a recent change in public grants is now calling for an increased effort in terms of promoting innovative financial solutions, like third-party financial services. In Italy, the presence of many fiscal bonuses for home renovation shows a favourable environment for the OSS launch. The 110% Super-bonus, that has recently been established in Italy via the “Relaunch Decree” (Decreto Rilancio), aims to help the “relaunch” of the Italian building market in response to the COVID-19 crisis. The super-bonus is a tax advantage available for those who are willing to make property upgrades that qualify as energy renovation. Taxpayers can offset 110% of renovation works against their tax liabilities, convert their tax credit into a discount of costs, or transfer it to a financial institution or an ESCO. Many banks are currently working on offering options and custom packages to homeowners and services providers. It opens new opportunities for the setting of new businesses within the home retrofitting. The OSS in Padova should take advantages from this opportunity, managing closely the relationship with banks and other financial institutions, in order to provide both technical and financial services to homeowners. In July 2020 the European Council agreed to a massive recovery fund, called Next Generation EU (NGEU)¹³, in order to support member states hit by the COVID-19 pandemic. The NGEU fund ensures that the recovery would be sustainable, inclusive, and fair for all Member States, supporting urgent investments, in particular in the green and digital transitions, which hold the key to Europe's future prosperity and resilience. It represents a good opportunity to revitalize

¹³ https://ec.europa.eu/info/files/eu-budget-powering-recovery-plan-europe_en



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the building sector and the home retrofitting market, which can lead the reduction of energy consumption and connected CO2 emissions.

The main threats emerged from the SWOT analyses concern the institutional framework, the economic and social issues. Referring to the institutional framework, the complex procedures to access public funds and incentives badly affect the capacity for homeowners to start renovation works. These elements increase information barriers and reduce the appealing of public financial supporting mechanisms. Another institutional threat refers to the low multi-governance coherence both between different governance levels (vertical integration) and between departments at the same level (horizontal integration). The lack of mandatory quality control and guarantee for home renovation works and services increase the distrust level emerged as one of the main weakness in the three target areas. This suggests that the OSS should provide quality guarantee and specific services to assuring clients about energy improvement after works. This is particularly relevant in Romania and Bulgaria, where the shared distrust highly affects the home retrofitting process. The stakeholder analyses show for the OSS a relevant role in providing intermediary services. In Italy, the new Super bonus 110% requires the guarantee of at least two energy classes improvement (to be demonstrated by means of the energy performance certificate); the possession of the requirements linked to the Minimum Environmental Criteria; and the demonstration of the fairness of costs. The complex procedures linked to this bonus, the timing of authorization, and the ongoing unclear scenario, make it less appealing to homeowners. The OSS may provide a good solution to facilitate the acquisition of information, guarantees, certifications etc. Economic threats refer to long pay-back times linked to public incentive (up to 10 years), difficulties to access credit, lack of loans with a public guarantee, and green mortgages. Families with low income are excluded from almost all public financial mechanisms, even from the Super bonus 110%. The COVID-19 pandemic also represents a high threat to the home renovation process. The lower inclination to make investments due to the COVID-19 economic crisis, the changing priorities, and the increasing of families with low economic capacity, further reduce the willing to start a home renovation project. However, beyond the short-term impacts, the COVID-19 pandemic may influence and change the home concept. The long lockdown periods may have changed the consideration of home comfort, indoor air quality, noise pollution, thermal expenditure, etc., which can increase long-term investments in energy efficiency and home renovation.

According to responses, the stakeholder analyses show many differences in the three target areas in terms of stakeholders' influence, interest and potential relationship with the future OSS. The only similarity concerns the importance of public bodies in shaping and performing the OSS. Further analyses are required to better understand how to engage key actors in the OSS business model.



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)

Bagaini, A., Colelli, F., Croci, E., & Molteni, T. (2020). Assessing the relevance of barriers to energy efficiency implementation in the building and transport sectors in eight European countries. *The Electricity Journal*, 33(8). Elsevier. Retrieved from <https://doi.org/10.1016/j.tej.2020.106820>

Bertoldi, P., & Boza-Kiss, B. (2018). One-stop-shops for energy renovations of buildings.

Boons, F., & Lüdeke-freund, F. (2013). Business models for sustainable innovation: state-of-the-art and steps towards a research agenda. *Journal of Cleaner Production*, 45, 9–19. Elsevier Ltd. Retrieved from

<http://dx.doi.org/10.1016/j.jclepro.2012.07.007>

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>

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

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

Caramizaru, A., Uihlein, A. (2020) Energy communities: an overview of energy and social innovation, EUR 30083 EN, Publications Office of the European Union, Luxembourg, ISBN 978-92-76-10713-2, doi:10.2760/180576, JRC119433.

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



Curtin, J., C. McInerney, and B. Ó Gallachóir, 'Financial Incentives to Mobilise Local Citizens as Investors in Low-Carbon Technologies: A Systematic Literature Review', *Renewable and Sustainable Energy Reviews*, 2017.

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/eur-scientific-and-technical-research-reports/accelerating-energy-renovation-investments-buildings>

ENEA. (2020). *Rapporto annuale sulla Efficienza Energetica*. Roma.
<https://www.enea.it/it/sequici/pubblicazioni/pdf-volumi/2020/raee-2020.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 (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 (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.

Fremouw, M., Bagaini, A., & De Pascali, P. (2020). Energy Potential Mapping: Open Data in Support of Urban Transition Planning. *Energies*, 13(5), 1264. Retrieved from <https://www.mdpi.com/1996-1073/13/5/1264>

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., Aabrekk, S. A., Mlecnik, E., Cré, J., Kondratenko, I., Paiho, S., ... Mostad, K. (2012). *Guidelines: How to develop a business model for One Stop Shop house renovation*. Retrieved from <http://www.one-stop-shop.org/sites/default/files/Guidelines-How-to-develop-a-business-model.pdf%5Cnhttp://www.one-stop-shop.org/>

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*



2.3 SWOT ANALYSIS

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>

IEA (2020), *World Energy Outlook 2020*, IEA, Paris <https://www.iea.org/reports/world-energy-outlook-2020>

IEA, 2020 *The Covid-19 Crisis and Clean Energy Progress*, IEA, Paris <https://www.iea.org/reports/the-covid-19-crisis-and-clean-energy-progress>

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

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

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.

Mendelow, A. L. (1981). Environmental Scanning--The Impact of the Stakeholder Concept. *ICIS 1981 Proceedings*. 20.

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

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

PADOVAFIT EXPANDED (2020). Deliverable 2.2. Strategic assessment. Retrieved from: <https://www.padovafit.eu/it/tn/pubblicazioni.html>

PADOVAFIT EXPANDED (2020). Deliverable 4.2. Analysis of households energy needs. Retrieved from: <https://www.padovafit.eu/it/tn/pubblicazioni.html>

PADOVAFIT EXPANDED (2020). Deliverable 5.2. Analysis of householders' financial capacity. Retrieved from: <https://www.padovafit.eu/it/tn/pubblicazioni.html>

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>

Pardo-Bosch, F., Cervera, C., & Ysa, T. (2019). Key aspects of building retrofitting: Strategizing sustainable cities. *Journal of Environmental Management*, 248(February), 109247. <https://doi.org/10.1016/j.jenvman.2019.07.018>

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



2.3 SWOT ANALYSIS

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.

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/>

Vonk G, Geertman S, Schot P. A SWOT Analysis of Planning Support Systems. *Environment and Planning A: Economy and Space*. 2007;39(7):1699-1714. doi:[10.1068/a38262](https://doi.org/10.1068/a38262)

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 Chryssochoidis, 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

The following questions aim to 1) identify stakeholders who may affect or be affected by the OSS; 2) evaluate the degree of interests and influence of all stakeholders; 3) Identify the role assumed by each stakeholder in order to reduce potential negative impacts and manage negative stakeholders.

Personal information

Name and Surname

Please type here.

Institution

Please type here.

Country

Please type here.

Email address

Please type here.

Please answer the following questions, according to your expertise and knowledge

1) For each stakeholder report the presence or absence in your target area, and the geographical scope of activities (local level, regional/county level, or national level).

PLEASE SELECT YOUR ANSWER BETWEEN THE OPTIONS (in order to map the stakeholders in your target area, please report also the organization/company name/s).

Stakeholder	Presence	Territorial base
Local authority Type here the organization/company name/s	Select the answer	Select the answer
Regional/County Authority Type here the organization/company name/s	Select the answer	Select the answer
Public agencies Type here the organization/company name/s	Select the answer	Select the answer
Building industry (façade, prefabricated elements providers, insulation industry) Type here the organization/company name/s	Select the answer	Select the answer



2.3 SWOT ANALYSIS

Manufactories (e.g. door and window providers) Type here the organization/company name/s	Select the answer	Select the answer
Technological products suppliers, e.g. RES plants, heating system providers, ventilations products providers) Type here the organization/company name/s	Select the answer	Select the answer
Home renovation services providers (Carpenters, plumbers, electricians, technological appliances agents) Type here the organization/company name/s	Select the answer	Select the answer
Contractors Type here the organization/company name/s	Select the answer	Select the answer
Energy advisors, energy certifiers Type here the organization/company name/s	Select the answer	Select the answer
Utilities Type here the organization/company name/s	Select the answer	Select the answer
Insurance companies Type here the organization/company name/s	Select the answer	Select the answer
Designers, architects, engineers, interior studios Type here the organization/company name/s	Select the answer	Select the answer
Professional boards Type here the organization/company name/s	Select the answer	Select the answer
Lenders (banks) Type here the organization/company name/s	Select the answer	Select the answer
ESCO Type here the organization/company name/s	Select the answer	Select the answer
Energy producers Type here the organization/company name/s	Select the answer	Select the answer
NGO and foundations Type here the organization/company name/s	Select the answer	Select the answer
R&D actors Type here the organization/company name/s	Select the answer	Select the answer
Building managers/administrator Type here the organization/company name/s	Select the answer	Select the answer
Owners and tenant associations Type here the organization/company name/s	Select the answer	Select the answer
Costumers associations Type here the organization/company name/s	Select the answer	Select the answer
Labour Unions Type here the organization/company name/s	Select the answer	Select the answer

2) For each stakeholder report the degree of interest and influence on the OSS.

Interest: The grade of attractiveness developed by a company. For a customer, it refers to the service's appeal, for a supplier the opportunity to sell products or services to the OSS (enlarge the market), for a partner the opportunity to open a new business with the OSS.

Influence/power: The power a stakeholder may employ in order to facilitate or impede the achievement of an activity's objective (e.g., the possession of key resources useful for the OSS work, the ability to open alternatives for the OSS setup (e.g. develop a joint venture), the capacity to reduce the OSS operation)

PLEASE RATE THE INFLUENCE/INTEREST BETWEEN 1 (LOW) AND 5 (HIGH)

Stakeholder	Influence	Interest
Local authority	Select the answer	Select the answer
Regional/County Authority	Select the answer	Select the answer
Public agencies	Select the answer	Select the answer
Building industry (façade, prefabricated elements providers, insulation industry)	Select the answer	Select the answer



2.3 SWOT ANALYSIS

Manufactories (e.g. door and window providers)	Select the answer	Select the answer
Technological products suppliers, e.g. RES plants, heating system providers, ventilations products providers)	Select the answer	Select the answer
Home renovation services providers (Carpenters, plumbers, electricians, technological appliances agents)	Select the answer	Select the answer
Contractors	Select the answer	Select the answer
Energy advisors, energy certifiers	Select the answer	Select the answer
Utilities	Select the answer	Select the answer
Insurance companies	Select the answer	Select the answer
Designers, architects, engineers, interior studios	Select the answer	Select the answer
Professional boards	Select the answer	Select the answer
Lenders (banks)	Select the answer	Select the answer
ESCO	Select the answer	Select the answer
Energy producers	Select the answer	Select the answer
NGO	Select the answer	Select the answer
R&D actors	Select the answer	Select the answer
Building managers/administrator	Select the answer	Select the answer
Owners and tenant associations	Select the answer	Select the answer
Costumers associations	Select the answer	Select the answer
Labour Unions	Select the answer	Select the answer

3) For each stakeholder identify the corresponding relationship with the OSS, between Partner, Supplier, Advocate-supporter, Investor, Customer, Competitor, Blocker.

Partner (a company or organization who closely collaborates with the OSS to provide services);

Supplier (a company or organization who provides key services and products to the OSS);

Advocate-Supporter (a company or organization who supports the OSS, by publicity, endorsements, providing new customers, etc.);

Investor (a company or organization who provides financial resources to the OSS);

Customers (final users of the OSS business);

Competitor (a company or organization who delivers similar services, which competes within the same market);

Blocker (a company or organization who acts as an obstacle to the OSS).

PLEASE SELECT YOUR ANSWER BETWEEN THE OPTIONS

Stakeholder	Influence
Local authority	Select the answer
Regional/County Authority	Select the answer
Public agencies	Select the answer
Building industry (façade, prefabricated elements providers, insulation industry)	Select the answer
Manufactories (e.g. door and window providers)	Select the answer
Technological products suppliers, e.g. RES plants, heating system providers, ventilations products providers)	Select the answer
Home renovation services providers (Carpenters, plumbers, electricians, technological appliances agents)	Select the answer
Contractors	Select the answer
Energy advisors, energy certifiers	Select the answer
Utilities	Select the answer
Insurance companies	Select the answer
Designers, architects, engineers, interior studios	Select the answer
Professional boards	Select the answer
Lenders (banks)	Select the answer
ESCO	Select the answer
Energy producers	Select the answer
NGO	Select the answer
R&D actors	Select the answer



2.3 SWOT ANALYSIS

Building managers/administrator	Select the answer
Owners and tenant associations	Select the answer
Costumers associations	Select the answer
Labour Unions	Select the answer

