Activating business models for condominium renovations

Identification of viable business models for Integrated Home Renovation Services for condominiums in the Netherlands and Flanders D2.2

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Identification of viable business models for Integrated Home Renovation Services for condominiums in the Netherlands and Flanders D2.2

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EU corporate blue	0	51	153	#003399
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Executive summary

The need for energy efficient buildings has become increasingly important in climate change mitigation. Almost 75% of the building stock in Europe is energy inefficient. Residential buildings are responsible for 27% of the total energy consumption in Europe. Integrated home renovation services (IHRS) have emerged as a potential solution to accelerate highly energy-efficient renovations for homeowners' associations (HOAs). The question arises: How can the business models of current IHRS accelerate highly energy-efficient renovations by HOAs? This report explores the current state of IHRS in Europe with a focus on the viewpoint of the Netherlands and Flanders. The methods used are desk research, questionnaires and interviews. Five business models (BMs) of CondoReno project partners were analyzed, to support their development strategies within the regional context. This report compares IHRS BMs and brings knowledge about the operation of IHRS. The results show that the BMs of the project partners share some similarities and differ in other aspects. Regarding the similarities, all five providers share the value of offering customized energy renovation packages, also in terms of customer segments, by addressing the specific needs of HOAs. They slightly differ regarding the channels used, customer relationships, key resources, key activities and key partners. They differ in revenue/value streams and cost structure, owing to context-specific aspects of the type of organization. As such, this study informs stakeholders about the development of effective and targeted IHRS initiatives in the EU.

Samenvatting

De noodzaak van energiezuinige gebouwen is in toenemende mate belangrijk geworden in het kader van klimaatverandering. Bijna 75% van het gebouwenbestand in Europa is onvoldoende energie-efficiënt. Woongebouwen zijn verantwoordelijk voor 27% van het totale energieverbruik in Europa. Geïntegreerde woningrenovatiediensten (GWRD) hebben zich ontwikkeld als een mogelijke oplossing om zeer energiezuinige renovaties voor verenigingen van (mede-)eigenaren (VvE's (NL), VME's (Vlaanderen)) te versnellen. De vraag rijst: Hoe bewerkstelligen de bedrijfsmodellen van de huidige geïntegreerde woningrenovatiediensten de energiezuinige renovaties door verenigingen van (mede-)eigenaren? Dit rapport onderzoekt de huidige staat van GWRD vanuit het oogpunt van de Lage Landen en Frankrijk. De gebruikte methoden zijn deskresearch, vragenlijsten en interviews. Vijf bedrijfsmodellen van CondoReno projectpartners werden geanalyseerd om de ontwikkeling van hun strategieën binnen de regionale context te ondersteunen. Om innovatie in woningrenovatieprocessen te bevorderen, categoriseert en vergelijkt dit rapport typische GWRD-bedrijfsmodellen en brengt dit werk kennis over het functioneren van GWRD. De resultaten tonen aan dat de bedrijfsmodellen van de projectpartners enkele overeenkomsten vertonen en verschillen op andere gebieden. Wat betreft de overeenkomsten delen de vijf GWRD de waarde van het aanbieden van op maat gemaakte energierenovatiepakketten, ook naar klantsegmenten, door in te spelen op de specifieke behoeften van VvE's en VME's. Ze verschillen enigszins wat betreft de gebruikte kanalen, klantrelaties, belangrijke middelen, belangrijke activiteiten en belangrijke partners. Ze verschillen in inkomstenstromen en kostenstructuur, vanwege context specifieke aspecten van het type organisatie. Dit onderzoek informeert aldus stakeholders voor de ontwikkeling van effectieve en gerichte GWRD-initiatieven in de EU.

List of abbreviations

Abbreviation	Meaning
ANTW	Antwerpen - The city of Antwerp, Belgium
APC	Agence Parisienne du Climat - Paris Climate Agency
BMC	Business model canvas
BM	Business model
CA	Condominium association
CM	Condominium manager
ESCO	Energy service company
GWRD	Geïntegreerde woningrenovatiediensten
HOA	Homeowners associations
IHRS	Integrated home renovation services
MECH	Mechelen - The city of Mechelen, Belgium
OSS	One-stop-shop
OOST	Oostende - The city of Ostend, Belgium
RME	Raad van Mede-Eigenaren – Council of Co-owners
TUD	Technical University of Delft
VEKA	Vlaams Energie en Klimaat Agentschap - Flemish energy and climate agency
VvE	Vereniging van Eigenaars – Homeowner Association
VME	Vereniging van Mede-Eigenaars – Co-owner Association (Flemish term for Homeowner Association)
WNR	Stichting WoonlastenNeutraal Renoveren (private non-profit organisation)

Terminology list

This document uses the following definitions.

Business model: A "business model" is a conceptual framework that outlines the core aspects of how an organization operates, generates revenue, and sustains its operations. It typically delineates the key components of a company's strategy, including its value proposition, target market, revenue sources, cost structure, and distribution channels. This model serves as a blueprint for how a business intends to create and capture value in the market, guiding its overall approach to conducting activities and achieving long-term sustainability and profitability (Osterwalder et al., 2005; Fielt, 2013; Laffont-Eloire et al., 2019).

Channels: The various ways through which the service providers reach and serve their target group (Osterwalder & Pigneur, 2010).

Condominium: A private residential unit within a multi-unit building where each unit is individually owned, while common areas are owned collectively by all unit owners. This form of ownership combines private ownership of an individual unit with shared ownership of common property (Feather, 1990; Van der Merwe, 2016).

Communication and IT intermediaries: These intermediaries play a role in facilitating the outreach communication and implementation of information technology solutions to enhance energy renovation processes.

Consultants: Intermediary actors who provide expert advice and guidance on energy renovation strategies, often assisting in decision-making and planning.

Co-owner: an individual that owns – or has the right to use spaces and goods through a deed that determines the possession of a share of spaces and goods in a condominium structure.

Cost structure: The overall expenses associated with the business model operations (Osterwalder & Pigneur, 2010).

Customer relationship: The nature of interactions and engagement between the business model owner and the target group (Osterwalder & Pigneur, 2010).

Customer segments/beneficiaries: Specific groups targeted for delivering the value proposed (Osterwalder & Pigneur, 2010).

Demand side: This term refers to the individuals or entities who trigger, represent, and encourage the demand for energy renovation services.

Finance and management: This encompasses the strategies and actions related to the allocation of financial resources for energy renovations, as well as the managerial aspects of overseeing such projects.

Geïntegreerde woningrenovatiediensten (GWRD): Gecoördineerde woningrenovatiediensten die worden aangeboden door professionals of teams van actoren van op elkaar afgestemde disciplines (Milin & Bullier, 2021). See also: IHRS.

Homeowners' associations: The legal entity that brings together all co-owners of a condominium (Van Der Merwe, 2015). The HOA is represented by a General Assembly. It is responsible for the daily management, maintenance and renovation of a building owned by co-ownership. Not to be confused with local/regional/national associations of homeowners that can exist through membership fees, and have a different legal status.

Integral approach for renovation: A comprehensive method that considers multiple aspects of a building's upgrades and renovations that considers individual preferences and societal perspectives, offered by professionals or teams that streamline the renovation process (Žegarac Leskovar & Premrov, 2019).

Integrated Home Renovation Services (IHRS): This concept encompasses a comprehensive approach that bundles diverse services for homeowners, emphasizing the will or need for energy-saving renovations. Those services include a series of actions ranging from the design to the management phases (Milin & Bullier, 2021).

Intermediaries: Actors, institutes, or organizations positioned between the supply and demand side, between the public and demand actors, and/or between the public sector and the supply side with a specific mission or activities to bridge gaps between these actors.

Key activities: The main activities executed by the service provider to deliver the proposed value (Osterwalder & Pigneur, 2010).

Key resources: The critical assets and capabilities required for delivering the proposed value (Osterwalder & Pigneur, 2010).

Key partners: External collaborations that enhance the effectiveness of energy renovation efforts (Osterwalder & Pigneur, 2010).

One-stop-shop: A service or business model that offers a wide range of services or products in a single location, aiming to provide convenience and efficiency by centralizing multiple related services for the customer (Boza-Kiss et al., 2021).

Public actors: This includes government agencies, public institutes and regulatory bodies that influence and regulate the energy renovation sector at the European, national, regional, and local levels, using distinct types of policy instruments.

Revenue streams/Value streams: The sources of income or benefit generated (Osterwalder & Pigneur, 2010).

Stakeholder: Stakeholders in the context of energy renovations for condominiums refer to individuals or entities that have a vested interest in the process and outcomes of such renovations. This typically includes condominium/flats/building owners, building managers, renovation service providers, energy efficiency experts, local authorities, construction SMEs and any other parties directly or indirectly impacted by the renovation efforts. These stakeholders often play essential roles in decision-making, funding, planning, and implementation processes related to energy renovations within Homeowners associations (Brown, 2018; Franklin, 2020; Estay et al., 2021; Milin & Bullier, 2021).

Supply side: This refers to actors, entities or businesses that offer products, systems, services, and solutions related to energy renovations, such as contractors, suppliers, and energy providers.

Value Proposition: The unique value or benefit that the business model owner offer to the customer segments (Osterwalder & Pigneur, 2010).

1.Introduction

This report focuses on identifying viable business models (BM) for integrated home renovation services (IHRS) for homeowners' associations (HOAs) in the Netherlands and Flanders. The aim is to support clear identification of how to activate IHRS for condominiums, if applicable, in close collaboration with cities and regions. This work should serve the development of suitable practices covering expectations regarding the adaptation of existing IHRS BMs in the European Union (EU).

The growing demand and need for renovations in the residential sector in Europe - which is responsible for 27% of total energy consumption (eurostat, 2020) - highlights the importance of this work, which presents a significant business opportunity for service providers. However, there is some ambiguity about how to set up and operate IHRS tailored especially for condominiums. Therefore, identifying viable BMs for IHRS is critical to ensuring the success of the service provider and meeting the growing need for such services for HOAs.

In this report, we explore the concept and necessity of IHRS in the Netherlands and Flanders, tailored specifically for HOAs. Chapter Two lays the foundational understanding of IHRS, elaborating on its significance within the context of the Netherlands and Flanders. This chapter also defines our research methodology and articulates the pivotal research question driving this study.

Progressing to Chapter Three, we conduct an extensive analysis of existing IHRS implementations for condominiums, initially focusing on the Netherlands, Flanders, and France. The chapter then broadens its scope to include a survey of similar services across the EU. Concluding this chapter, we critically assess the BMs of the Condoreno partners, identifying both their strengths and gaps. We also discuss the necessary tools required to enhance these BMs for optimal efficiency and effectiveness.

In Chapter Four, the report identifies the barriers and opportunities that exist for further development of IHRS, drawing valuable insights from previous and ongoing EU projects, as well as lessons learned from workshops conducted by Condoreno partners. This chapter culminates with actionable recommendations for the development of robust and viable BMs targeting HOAs. Chapter Five engages in a thorough discussion on the prospects of IHRS for condominiums within the Netherlands and Flanders. It provides in-depth recommendations for enhancing local public BMs, and market-driven BMs of IHRS, informed by our research findings and analysis.

Finally, the report concludes with Chapter Six, which synthesizes the insights and findings from the preceding chapters into a cohesive conclusion, highlighting the key takeaways and offering a forward-looking perspective.

Other results from this report are:

1. Mapping the barriers and opportunities for the development of IHRS for HOAs and initial guidance on how to solve those barriers.
2. Structured overview of planned local actions, including HOAs and areas that can be targeted, the values that can be proposed to them to reach highly energy-efficient renovations, the channels through which HOAs can be reached, the relationships that can be exploited, resources that can be used, local activities that can be planned, partnerships that can be targeted.

The CondoReno project

This report is produced in the framework of the EU LIFE project CondoReno (https://condoreno.org) funded by the European Union's Programme for Environment and Climate Action (LIFE) MGA under grant agreement No. 101076316. The project aims to support the creation of IHRS for buildings co-owned by multiple private homeowners, focusing on HOAs in the Netherlands and Flanders, while paving the way for upscaling IHRS across Europe. CondoReno will lead to the development of IHRS for HOAs interested in the implementation of energy renovations. The services developed in this project will offer support across the whole renovation journey for buildings co-owned by multiple private homeowners which could be referred to as a homeowner association, condominium association (CA) or, as known in the Netherlands as a VvE 'Vereniging van Eigenaars' and in Flanders as VME 'Vereniging van Mede-Eigenaars'.

The objective of the CondoReno Project is to create six IHRS for buildings co-owned by multiple private homeowners, targeting the Netherlands and Flanders while paving the way for upscaling such IHRS across Europe.

CondoReno will deploy IHRS across Europe by combining the strengths of market-driven IHRS in the Netherlands and local authority-driven IHRS in Flanders into adapted IHRS BMs. These will be tested by intervening directly in meetings of eight HOAs.

The IHRS will stimulate living-cost neutral propositions and financial arrangements for achieving label A renovations while training HOAs on good governance and daily management of the building and small and medium enterprises (SMEs) on quality assurance and performance contracting.

Local stakeholder groups will co-create local IHRS supply in three cities and the project will activate HOA demand for local IHRS supply with workshops and matchmaking events. A Flemish digital resource center will be initiated that supports actor listing at the local level and matchmaking.

By demonstrating market evidence of the IHRS, the project aims to develop cross-sectoral agreements for the further multiplication of IHRS in multiple cities and regions across Europe. This will be further supported by engaging the local, national and international networks and communication channels of project partners and stakeholders (Mlecnik & Elgendy, 2023).

In the context of the CondoReno project, this report results from Work Package 2 (WP2) as a critical WP, supporting a comprehensive IHRS approach to energy renovations for HOAs. This WP functions as a linchpin within the broader research framework, exemplifying the integration of empirical data and innovative practices in BMs.

CondoReno operates on the principle of open knowledge dissemination, strategically sharing data and guidance to foster the replication of BMs initiatives by other market actors. This approach is underpinned by a systematic collection and analysis of data, ensuring that the dissemination is not merely informative but also empirically validated. The recognition of the value of IHRS for condominiums by the market is a testament to the efficiency of these services, validated through market-based evidence.

Furthermore, this work investigates the dynamics of functioning partnerships, providing a scientific inquiry into the collaboration between companies and associations. This involves an analysis of best practices and models in offering IHRS for condominiums, emphasizing the importance of empirical evidence in validating these practices.

The narrative extends to other work within the CondoReno project. It informs partners' tool development by identifying essential methodologies and tools through a review process. It contributes knowledge to the co-creation of IHRS, integrating scientific methods with practical applications. Lastly, it lays the groundwork for the scientific evaluation of IHRS development, drawing on the comprehensive data and insights gathered.

Who should read this report and why?

This report will be useful to a wide range of stakeholders who are interested in the home renovation and construction industry. Specifically, the following groups:

- **Service providers**: interested in offering IHRS to condominiums in The Netherlands and Flanders the can gain significant value from this report. It offers insights into the best practices and suitable BMs for IHRS in the region.
- **Investors**: understanding the market trends, growth potential, and investment opportunities for IHRS for HOAs in Europe.
- **Policy makers**: This report will be of particular interest to policy makers responsible for the development of regulations, incentives, and support systems for the home renovation and construction industry.
- **Condominium/ homeowners' associations**: those who plan to renovate their homes can find this report helpful in understanding the benefits of IHRS and the available service providers in the region.
- **Condominium managers:** who support HOAs in the daily management and renovation of their buildings.
- **Researchers and academics**: who are working on finding solutions to accelerate energy renovations of the housing sector in Europe.

2.Problem statement and research methodology

2.1 Integrated home renovation services for condominiums

The prevalent challenge lies in the slow adoption of energy-efficient renovations by HOAs (Mlecnik, 2022), stemming from a combination of financial, regulatory, and decision-making complexities (Bagaini et al., 2022). The absence of streamlined BMs tailored to the unique dynamics of these associations further impedes the swift implementation of energy-efficient measures (Elgendy et al., 2023), leading to persistent energy inefficiencies and hindering the achievement of sustainable development goals within the housing sector. Although there are pilot projects all over Europe, the renovation rate is still low at 1% (Tsemekidi Tzeiranaki et al., 2022) and with the current rate of energy renovations the EU won't be able to achieve their goals (EASME et al., 2023). The slow rate of energy renovations for HOAs is hindered by the complexity of the whole process (Henriel et al., 2018; Murto et al., 2019; Končalović et al., 2022) starting from the collective decision-making process for the exploration, scenario-building, financing and execution of the renovation including quality checks. That's why there is a need to identify successful methods and strategies to upscale such renovations targeting HOAs. IHRS providers are needed to tackle energy inefficiency in European homes (D'Oca et al., 2019; Milin & Bullier, 2021; Mlecnik, 2022). Milin and Bullier (2021) argue that such services require a comprehensive approach that goes through all stages of the renovation process. They also highlight the importance of involving multiple stakeholders, including homeowners, service providers, and local authorities, in the development and delivery of such services.

IHRS refers to a comprehensive approach that combines various services into a bundled offer of energy renovations for homeowners (Cre et al., 2012; Milin & Bullier, 2021). IHRS can play a crucial role in achieving the EU goals related to energy transition. These services can help reduce greenhouse gas emissions by improving the energy efficiency of buildings and promote a more sustainable and resilient future. A study by Milin and Bullier (Milin & Bullier, 2021) found that IHRS, which combines technical, financial, and social support, can help overcome the barriers to home renovation and increase the uptake of energy-efficient measures. Similarly, Pardalis (Pardalis, 2021) emphasizes the importance of holistic and integrated approaches to home renovation, which consider the building's envelope, systems, and user behavior. Overall, IHRS can contribute to a more sustainable and energy-efficient built environment, while also addressing the social and economic challenges of home renovation.

2.2 Why Integrated Home Renovation Services for Condominiums are needed in the Netherlands and Flanders?

HOAs in Europe, particularly in the Netherlands and Flanders, can benefit from IHRS to achieve the EU's energy transition goals. HOAs are responsible for the maintenance and renovation of multi-unit residential buildings, which account for a significant – and still growing - portion of the building stock in Europe (Szczepańska, 2015). These associations often face challenges related to decision-making, funding, coordination, and communication, which can impede the uptake of energy-efficient measures (Haavik et al., 2012; D'Oca et al., 2018; Mlecnik et al., 2019). Such IHRS can offer

technical assessments of the building's energy performance, develop customized renovation plans, and coordinate the works with the contractors and the residents. At the same time, financial support can come in the form of subsidies, loans, or energy performance contracting, which can alleviate the upfront costs and ensure the long-term benefits of the renovation. Moreover, social engagement can involve the residents in the decision-making process, raise awareness about energy efficiency and sustainability, and foster a sense of community.

In the Netherlands and Flanders, the situation of HOAs varies depending on the context and the legal framework. For example, in the Netherlands, HOAs are legally required to have a reserve fund for maintenance and renovation and can benefit from subsidies and tax incentives for energy-efficient measures (Civil Code Book 5). In Flanders HOAs legally require a reserve fund for maintenance and renovation, but HOAs can decide with a 4/5 majority not to create a reserve fund (Jalo, 2018; "Renovation of the Belgian Property Co-Ownership Law," 2019). A lack of reserve funds for Flemish – even Belgian – HOAs leaves them unprepared for deep energy renovations and even larger maintenance works. By examining such challenges, both regions can learn from each other to improve policy and the functioning of IHRS.

In the Netherlands, there are about 125 thousand registered HOAs (CBS, 2023) and in Flanders, there are about 57 thousand registered HOAs (Syndi.be, 2023). Overall, IHRS can help HOAs overcome the challenges of energy-efficient renovation, improve the energy performance of their buildings, increase the value and comfort of the units, and contribute to a more sustainable and resilient built environment.

2.3 Business models for IHRS providers

A business model is a strategic management tool that helps identify how an organization captures, creates and delivers a value in the market (Chesbrough, 2007). BMs are not just for private businesses, they are widely used in the public sector as well (Lloyd & Randle, 2020). The key elements of BMs comprise a unique value proposition, target market, revenue/value streams, cost structure, partnerships, scalability, and risk assessment (Bagaini et al., 2022). To formulate a viable BM and business plan, initiating the process with the widely recognized Business Model Canvas (BMC) proves to be beneficial (Cicmanova et al., 2020). A BMC that was developed by Alexander Osterwalder et al. in 2005 is being used by various scholars in literature (Mlecnik et al., 2019; Pardalis et al., 2020; Bagaini et al., 2022; Elgendy et al., 2023), practitioners (Veit et al., 2014) and also public organizations (Wirtz et al., 2023) as a core for the development of their study's, businesses and organizations. Identifying viable BMs is crucial for successfully upscaling deep renovations for HOAs.

IHRS aims to simplify the process for homeowners by offering One-stop-shop (OSS) solution in which all aspects of the project are handled at a single point of contact (Croci et al., 2019; Bertoldi, Boza-Kiss, et al., 2021; Boza-Kiss et al., 2021; Pardalis, 2021). The term one-stop-shop is sometimes used interchangeably with IHRS but may refer to a wider range of services and approaches (Milin & Bullier, 2021). Different types of OSSs are working on energy transitions with different BMs

targeting different customer segments (Bagaini, Croci, and Molteni 2022; D'Oca et al. 2019; Pardalis 2021).

Those types or models of OSSs can be seen in literature and EU projects like STUNNING (Laffont-Eloire et al., 2019) and INNOVATE (Cicmanova et al., 2020) as two examples describing different BMs of OSSs based on different value propositions but all offering energy renovations for homeowners.
There are 4 main types of OSS models known which are the facilitation model, coordination model, all-inclusive model, and ESCO-type model. Those types categorize current OSSs and the way they operate and capture, create and deliver the proposed value.

Business model	Roles & responsibilities	Practical example of what the one-stop-shop offers to homeowners
1 Facilitation model	• Raise awareness on energy renovation benefits • Provide general information on optimal renovation works • First advice at the 'orientation stage'	It advises on how to renovate your house and can provide you with the list of suppliers.
2 Coordination model	• Coordinate existing market actors (suppliers) • Make sure all one-stop-shop services are offered to homeowners • No responsibility for the result of renovation works (only overlooking the whole process) • No responsibility for the overall customer journey (just the first part)	It advises on how to renovate your house and will push suppliers to comply with their promises. Suppliers remain responsible for the final result.
3 All-inclusive model	• Offer a full renovation package to homeowners • Bear responsibility for the result of renovation works • Bear responsibility for the overall customer journey	The one-stop-shop is a contractor that sells you the whole service package and is your main contact point in case something goes wrong with suppliers.
4 ESCO-type model	• Offer a full renovation package with guaranteed energy savings to homeowners • Bear responsibility for the result of renovation works • Bear responsibility for the overall customer journey	The one-stop-shop sells you the renovation package and guarantees the energy savings for the contract duration. The one-stop-shop is paid through energy savings achieved.

Figure 1: Main types of OSSs (Facilitation model, coordination model and all-inclusive model source: (Cicmanova et al., 2020)

2.4 Research needs

There is a need for research to identify viable BMs of IHRS tailored for HOAs in the Netherlands and Flanders, to upscale energy renovations. HOAs face challenges in implementing energy-efficient renovation measures which can hinder the adoption of these measures. However, IHRS have the potential to provide a comprehensive solution to these challenges by combining technical expertise, financial support, and social engagement. To ensure the uptake of these services by HOAs, there is a need to identify and develop viable BMs through research and evaluation that can balance the interests of the different stakeholders involved, including the residents, the contractors, the financiers, and the policymakers and balance between all costs associated with the various phases of the renovation process and the revenues generated by the business. This balance ensures that the BM is sustainable, avoiding negative revenue while keeping costs low. By maintaining affordability, the model becomes more attractive to the target group, promoting broader adoption and success. This approach aligns costs with expected revenues, ensuring the business remains financially viable and appealing to clients seeking energy renovation services.

These BMs should be based on a thorough understanding of the market demand, the regulatory framework, the technological options, and the social dynamics. By identifying viable BMs of IHRS, tailored to the specific needs of HOAs, it is possible to upscale energy renovations and contribute to the achievement of the EU's energy transition goals.

2.5 Research question and methods

This report aims to answer the question: *How can the business models of current IHRS accelerate highly energy-efficient renovations by HOAs?*

The report will try to answer this question by answering the following sub-questions:

- What are the business model components of current IHRS that target HOAs?
- What insights can be derived from European projects to enhance the constituent elements of the business model for IHRS providers?
- What factors contribute to the viability of business models for IHRS providers?

The report investigates this question from a strategic management perspective using the BMC based on Alexander Osterwalder's et al. earlier work (Osterwalder et al., 2005) to find synergies while creating business approach recommendations and finding new strategies (Osterwalder and Pigneur, 2010).

The methodology employed in this study involved an initial literature review focusing on IHRS providers and their corresponding BMs. Subsequently, an in-depth examination of specific cases was conducted, primarily centered around partners associated with the Condoreno project, which encompasses the cities of Antwerp, Mechelen, and Ostend, along with WNR and APC. Additionally, other relevant cases were analyzed, including those of Amsterdam, Rotterdam, The Hague, Brussels, and various BMs from different European regions such as Hauskunft in Austria and Oktave in France.

The chosen cases were evaluated to understand the operational dynamics and strategic approaches of these entities in facilitating energy renovations for HOAs. Qualitative questionnaires and interviews were then carried out with eight distinguished experts affiliated with the aforementioned IHRS providers. The questionnaire and interviews aimed to investigate nine key aspects of the BMs, as defined by Osterwalder et al. (2005), including customer segments, value proposition, channels, customer relationships, revenue/value streams, key activities, key resources, key partners, and cost structure.

The selected interviewees, including representatives from the Condoreno project partners and other relevant entities, were pivotal in providing insights into the various approaches and strategies employed in the energy renovation sector. Detailed records of the interviews were transcribed for comprehensive analysis, and the findings were subsequently shared with the interviewees for validation. During the discussions, each interviewee presented their BM using the BMC.

Table I: Profile of the conducted interviews

Code	***Date***	***Type of organization***	***Position interviewee***	***Duration***	***Data collection method***	***Method***
I-1	09-01-2023	Public Agency in a large city	Project leader	1h and 3 min	Questionnaire then interview	Online
I-2	06-03-2023	Public actor Larger municipality	Project coordinator	47 min	Questionnaire then interview	Online
I-3	13-02-2023	Public actor Medium-sized municipality	Consultant	1h	Questionnaire then interview	Online
I-4	23-01-2023	Private non-profit organization provider	Director	57 min	Questionnaire then interview	Online
I-5	09-05-2023	Public actor small-sized municipality	Project coordinator	1h	Questionnaire then interview	online
I-6	16-11-2022	Public actor large-sized municipality	Renovation advisor	1h	Interview	in person
I-7	15-09-2023	Public actor large-sized municipality	Executive project manager	1h	Interview	online
I-8	01-06-2023	Public actor large-sized municipality	Sustainability broker	1h	Interview	In person

The report further contains:

- Overview of Business Models: It examines BMs identified in literature and EU projects, and from interviews with professionals in energy renovations for HOAs. This provides a comprehensive understanding of current practices, trends, and innovative strategies in the IHRS sector, which is essential for understanding what makes these models viable (Chapter 3).
- Barriers and Opportunities: By analysing barriers and potential growth areas, the report aims to identify key factors that can be leveraged to enhance the viability of IHRS providers' BMs (Chapter 4).
- Workshop Results: Insights from workshops with professionals and expert groups discussing IHRS BMs contribute to a deeper understanding of industry perspectives, allowing for a more nuanced approach to developing effective and sustainable business models (Chapter 4).
- Local Action Plans: These plans for sustaining IHRS development in condominiums offer practical, localized strategies that can be critical for the practical implementation and adaptation of BMs in specific contexts (Chapter 5).
- Each of these components contributes to answering the questions by providing a thorough analysis of the existing landscape, identifying factors that influence the success of BMs, and suggesting ways to improve and adapt these models for better viability and market alignment.

3.Developing business models for IHRS for Homeowners' associations

IHRS has become increasingly important for HOAs to help them in undertaking a deep renovation project through different approaches and models. To promote these services, with the coordination of TUD five partners – Agence Parisienne du Climat (APC), the city of Mechelen (MECH), the city of Antwerp (ANTWP), the city of Ostend (OOST) and Woonlasten Neutraal Renoveren (WNR) - joint forces to discuss and compare their BMs and collaborate on strategies for promoting IHRS for HOAs.

The objective of these discussions was to gain a deeper understanding of the BMs of each partner and to identify potential areas of strength. Through these meetings, the partners were able to exchange valuable insights and perspectives on the most effective ways to promote IHRS, and to explore innovative solutions to common challenges.

Additionally, the analysis extended beyond the discussed BMs of the CondoReno partners, as they delved into an exploration of successful cases from other prominent cities, including Amsterdam, Rotterdam, The Hague, Brussels and Vienna. This strategic move aimed to broaden the knowledge base, leveraging diverse perspectives and experiences from different regions to gain deeper insights into the dynamics of energy renovations within HOAs. The incorporation of these varied approaches contributed significantly to the development of a more holistic and adaptable framework for the effective promotion of IHRS among the target group.

3.1 Business models - CondoReno

3.1.1 Existing IHRS for condominiums in the Netherlands, Flanders and France

As a research team at TUD, we conducted a series of interviews, questionnaires, and workshops with our project partners, including ANTW, WNR, APC, MECH, and OOST. The objective of these activities was to undertake a comprehensive mapping exercise of their current BMs, which aims to provide IHRS to HOAs. Our research focused on understanding our partners' strategic approaches, future, and potential opportunities and threats, with the aim of developing advanced BMs that can be implemented by them in a later stage of the CondoReno project.

Agence Parisienne du climat

APC offers IHRS for HOAs in Paris and France. The customer segments for APC are HOAs, CMs and homeowners. The agency serves as a facilitator, local advisory reference, energy advisor, and technical support provider. To reach its customers, APC uses various channels such as social media, APC events, and municipal papers. APC's customer relationships are strengthened through events such as forums, visits, meetings, and CoachCopro trophies, and by providing a digital place for customers to review its services.

APC serves as the gateway for condominiums to access public grants provided by the city council and the Metropolitan Area. These grants are aimed at supporting condominiums in both the conception and development phases of their retrofit projects. In the conception phase, the city council provides a €5,000 voucher to cover the cost of a "Technical Global Energy Performance

Diagnosis" of the condominium. Additionally, the Metropolitan Area offers a grant of €10,000 to cover the project ownership fees. For the development phase, the EcoRenov Paris program is available for global renovation projects, and households can receive a grant of €8,750 for projects that result in up to 50% energy consumption savings. Condominiums undertaking ambitious retrofit projects can apply for the EcoRenov+ program, which provides additional technical support throughout the entire duration of the project. The agency receives financial support from the City of Paris to support HOAs.

The key activities of APC include providing technical and administrative support for HOAs, contributing to the Local Urbanism Plan, executing studies, raising public awareness, and conducting events/webinars for experts. The agency also trains professionals in the field of building retrofitting. APC's key resources are its human resources, data from the City of Paris, tools for data (CoachCoPreo) and energy diagnoses, and copyrights. The agency partners with the City of Paris, the Greater Paris Metropolitan area, and other stakeholders such as ADEME Ile-de France, RATP, CPCU, EDF, CSTB, and APUR.

APC's cost structure includes salaries for its energy advisors network and digital tools.

Strengths:

APC's role as a facilitator and local advisory reference provides significant value to its customers by guiding them through the complex process of building renovation. The agency's partnership with the City of Paris and the Greater Paris Metropolitan area provides a stable source of revenue and support. The provision of a voucher and a grant for HOAs, as well as energy-saving certificates, makes the renovation process more affordable for customers. APC's strong network of partnerships with various stakeholders enables it to provide a comprehensive range of services to its customers.

As a non-profit association, APC receives funding from the Energy Renovation Support Service deployed by the Metropolitan Area of the city. This funding is further supplemented by a specific financial envelope from the City Council, aimed at achieving building retrofit objectives in the climate plan and covering the expenses associated with OSS activities. Together, these funding sources enable APC to operate and provide essential support to condominiums in their energy retrofit projects.

Weaknesses:

The agency's reliance on financial support from the City of Paris and the Greater Paris Metropolitan area makes it vulnerable to changes in its funding priorities. The complex process of building renovation and the regulatory environment in Paris may create barriers to entry for new customers.

The strong and complex urbanism and conservation codes sometimes go against the objectives of renovation projects.

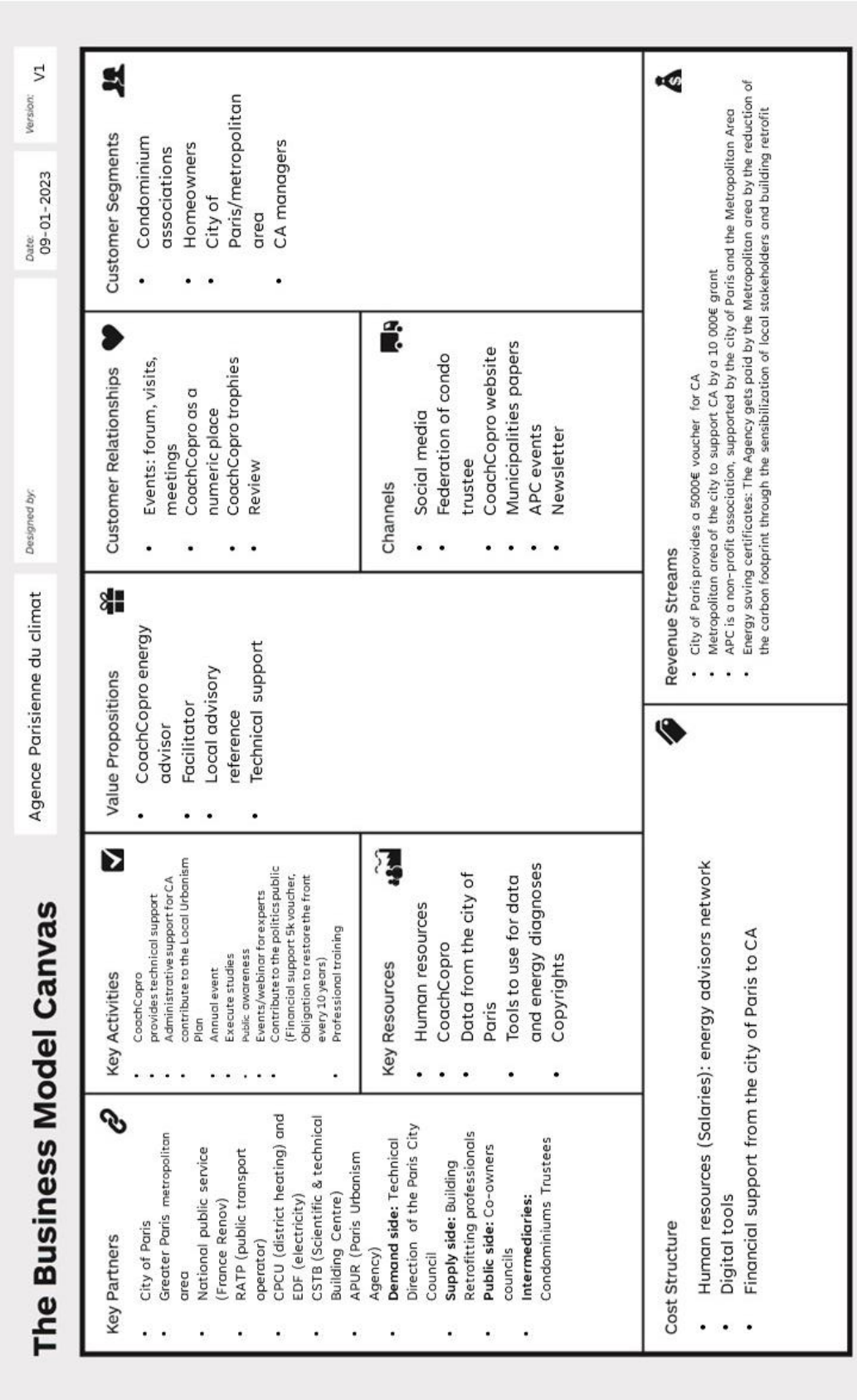

Figure 2: The Business model Canvas of APC

City of Antwerp

The City of Antwerp has developed a BM aimed at providing IHRS for HOAs to undertake deep renovations. The target customer segments for this BM include condominium managers (CMs) and board of co-owners residing in apartment buildings with more than 15 dwellings and are older than 20 years, The business model's value proposition entails the provision of support to HOAs to create a renovation masterplan (analysis of the condition of the building, multi-year maintenance plan, scenarios to move to an energy-efficient building), transparent overview of total cost of ownership, and coaching the investment decision; transparent advice throughout the preparation of a renovation process. The BM employs multiple channels to inform the target customer segments, including events, networks with HOAs and expert teams, websites, email, webinars, conferences, and promotion videos. Customer relationships are built on the basis of being a trusted and neutral advisor, providing personalized tailored services, transparent communication, and solution-focused co-creation.

Currently, the Revenue streams are generated from about 46 HOAs signing up for the masterplan approach, four condominiums making ambitious investment decisions, and an investment decision of about €25,000-50,000 per dwelling. The main activities of the BM include communication with the target group and the development of a master plan study for large apartment buildings. Preparation of the renovation masterplan: preparing all kinds of building facts, resident survey to detect issues, sending specifications to architect's office, comparing offers, guidance of the bod of co-owner's decision; coaching the process of making the renovation masterplan by architect office and engineering office. Coaching the board of co-owners and CMs during the renovation masterplan, offering financial coaching of co-owners and presence investment decisions to renovation works.

The city of Antwerp offers various forms of renovation coaching, depending on the size of the building. Depending on this type of coaching, HOAs can benefit from one of two subsidies for the development of the renovation master plan. There is one for buildings with less than 15 units and one for buildings with 15 units or more. The subsidy for apartment buildings with fewer than 15 units covers 50% of the costs of the study, up to a maximum of €7,500. The second is a subsidy from the Flemish government and is available for apartment buildings with 15 or more units. This subsidy covers 60% of the cost of the study, up to a maximum of €12,000. The advice of the renovation coach is free of charge.

The key resources include renovation coaching by the local government, grants from the City of Antwerp and the Flemish government, customer relationship management (CRM) tools, Flemish subsidies and loans for HOAs and homeowners, and a network of experts for advice. Key partners of include the board of co-owners, CMs, architects and engineers who conduct the studies, governments, and experts.

The cost structure of involves resources paid for by Energiehuis Antwerp and through EU projects, with technical studies paid for by HOAs.

Strengths:

The BM has several strengths. It offers a comprehensive renovation solution that includes a masterplan, financial coaching, and expert advice. The provision of grants to support the implementation of the masterplan reduces the financial burden on HOAs and could influence and drive homeowners to undertake deep renovation projects. The emphasis on personalized services and transparent communication fosters a strong relationship. The city of Antwerp has already successful pilot projects that would increase the trust of the HOAs.

Weaknesses:

The model is heavily reliant on grants and subsidies, which can be unpredictable and subject to change. The technical studies required for the masterplan can be costly for homeowners, which may limit the market of potential customers.

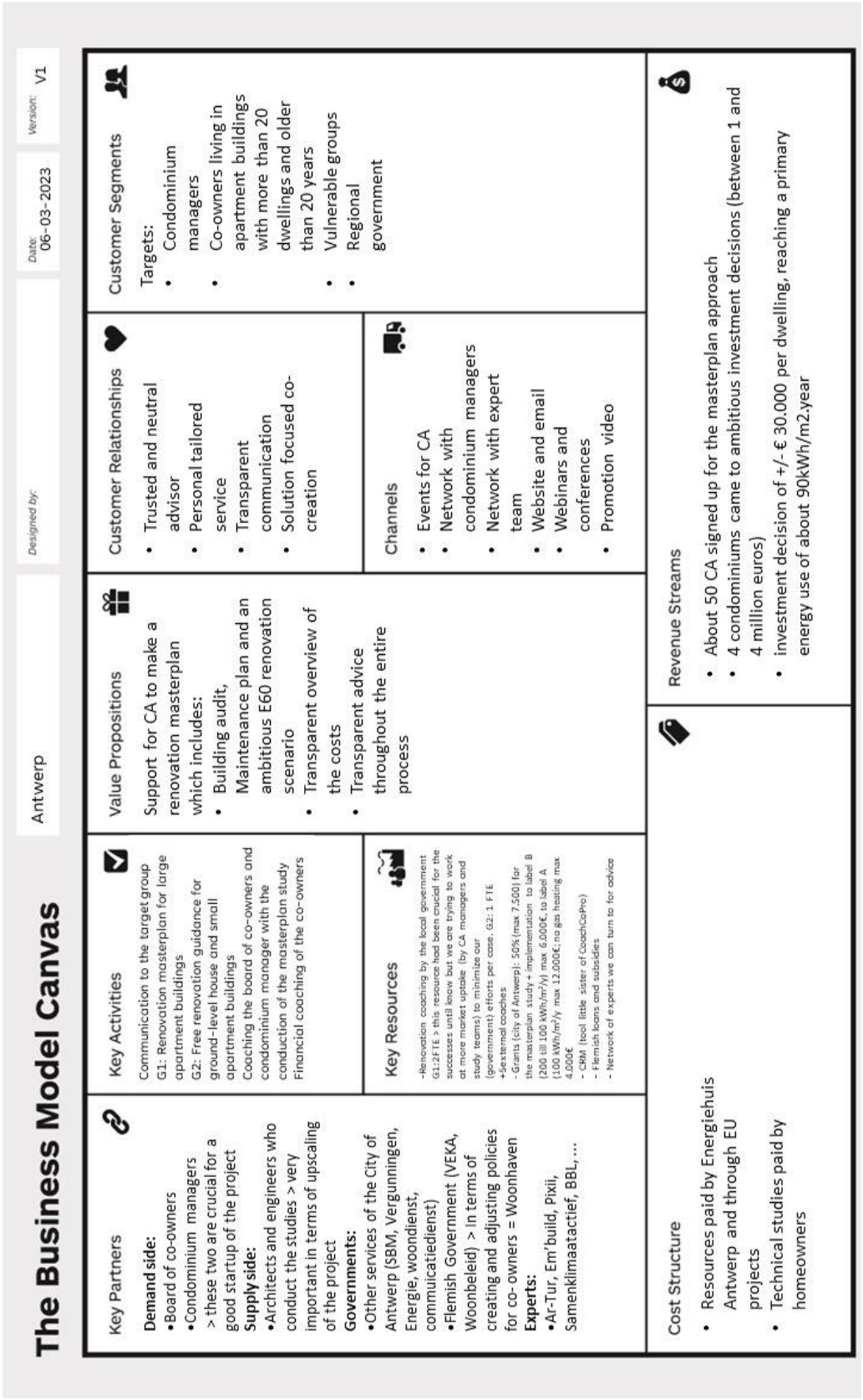

Figure 3: The Business model canvas of the city of Antwerp

City of Mechelen

The city of Mechelen has implemented a comprehensive BM that provides IHRS to HOAs to undertake deep renovations. The targeted customer segments include HOA board members, CMs and homeowners. The model is aimed at large, and medium high-rise condominiums built before 2012, actively, and small condominiums, passively. The value proposition of this model includes several benefits, such as affordable energy renovation tailored to the building, HOA, and homeowners, lower energy bills, preservation or increase in the value of the condominium, and an ongoing renovation process. To communicate with customers, various channels are used, including online request forms, digital newsletters for HOAs and CMs, personal letters, flyers, information on HOAs meetings, network events, and information sessions. In the years to come the city of Mechelen will also offer webinars, and training for HOA board members and CMs.

The city of Mechelen seeks to build strong customer relationships by being a trusted advisor, offering transparent communication, and solution-focused co-creation. The revenue streams for this model are generated through some EU-funded projects, such as CondoReno grants, VEKA grants for the renovation coaches, and possibly VEKA grants for guiding HOAs to renovation master planning. HOAs are currently not required to pay for the services provided by the city. The city of Mechelen will explore if other revenue streams can be considered (e.g. energy savings as a revenue stream through ESCO services, or via equity or public funding). The investment concept developed, and the support offered by the EU City Facility project will be valuable for this purpose. Besides the tangible financial revenues, the city of Mechelen receives also benefits in the form of lower carbon emissions on their premises because of the renovation of the condominiums. To measure these non-financial incomes, the city of Mechelen monitors the energy use and the carbon emissions before and after renovation.

The main key activities include providing independent advice on energy renovation (small condominiums), referring HOAs to engineering offices for renovation master planning (medium and large condominiums), offering low-threshold information and assistance in applying for loans and subsidies (all condominiums) coaching HOAs on their decision-making processes (medium and large condominiums), engaging in policy advocacy for condominiums. In the future, the city of Mechelen will take its BM to the next level by improving the technical assistance offered and integrating financial support mechanisms. Key resources include staff, CRM tools, Flemish loans and subsidies, a network of experts, and studies recently conducted in Mechelen e.g. Climate Districts and EU City Facility investment concept.

The model relies on a partnership with various actors, including HOA board members and managers, other services of the City of Mechelen, VEKA, energy community Klimaan, engineering offices, and architects. The city of Mechelen will expand this partnership in the future with e.g. United Owners, BIV, contractors, banks, energy distribution grid manager Fluvius, contractor federation (Embuild), Antwerp, non-profit organizations Pixii, Kamp C, and BBL-Ecobouwers, and lawyers with expertise in condominium law. The cost structure comprises salaries of CondoReno project members, communication costs, and CRM.

Strengths:

The model offers a comprehensive approach that includes independent advice, referral to engineering offices, low-threshold information and assistance in applying for loans and subsidies, coaching on decision-making processes, and advocacy. The model provides tailored services that are specific to the building, HOA, and homeowners. The model has a strong network of partnerships that can provide expertise and resources. The model provides an ongoing renovation process that can help ensure long-term success. comprehensive studies have been conducted in Mechelen which provide much insight on building at the building stock level.

Weaknesses:

The model's revenue streams are currently limited to EU grants which cover salaries. This revenue stream may not be sustainable in the long-term. The model does not currently require payment from HOAs for its services, which may make it difficult to sustain the model's operations. The model is still developing and needs to be tested to make sure to include all necessary partners and resources needed.

Overall, the BM developed so far by the city of Mechelen presents a promising approach to addressing the challenges of energy efficiency and sustainability in the home renovation sector and for HOAs.

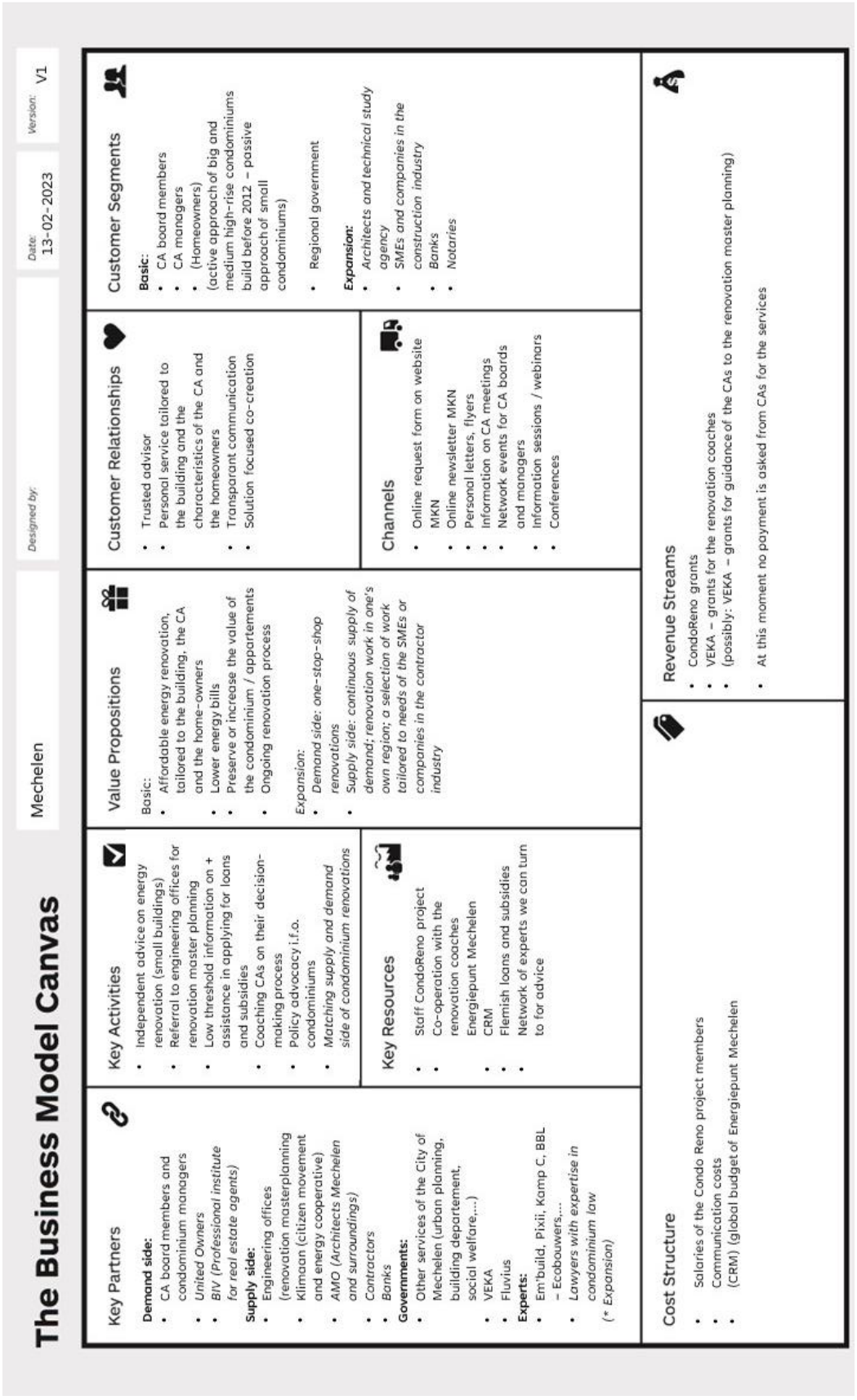

Figure 4: The Business model Canvas of the city of Mechelen

Woonlasten Neutraal Renoveren (WNR)

Woonlasten Neutraal Renoveren (WNR) is a non-profit organization that offers an IHRS to the Board of HOAs with over 50 dwellings built between the 1960s to 1980s, homeowners in condominiums, and Municipalities. WNR's value proposition circles around acting as a facilitator and connector between parties, attending HOAs meetings, raising public awareness, and providing guidance to municipalities. WNR has diverse channels such as LinkedIn, Twitter, webinars, website, journals/papers, booklets, brochures, events, and local newspaper ads to reach their customers. WNR's revenue stream is based on investment decisions divided into phases, such as feasibility study, design, engineering, and realization. The investment for the feasibility study is relatively low and based (partly) on the number of houses within the condominium. HOAs pay WNR a certain amount of fees for the services in the final phase of the renovation.

The organization's key activities involve activating its WNR model, providing process guidance, coordinating cooperation partners, and advising municipalities, smaller social housing associations, and CMs. WNR is responsible for the entire renovation process, starting from the initial advice until the renovation itself (in partnership with other organizations). WNR has a full-time employee and multiple part-time employees for cooperation partners. The organization also utilizes the DNA platform, consisting of around 85 SME members, data, tools, and software through its partnerships.

WNR's key partners are BouwNext, Ontwerpmanagement BV, Segon BV, DNA (quality platform), municipalities, experts (architects, companies, lawyers, among others), and in collaboration with Kennisinstituut KERN. The cost structure of WNR includes salaries as the most expensive key resource, insurance, taxes, traveling, office space rent, website, and investments/funding, which often come (partly) from municipalities.

Strengths:

WNR functions as a key facilitator and connector between HOAs and other parties, providing guidance and coordination to ensure seamless cooperation. The organization's transparent and communicative approach to customer relationships establishes trust with HOAs, offering attention and follow-up to customers throughout the process. The non-profit status of WNR, coupled with its focus on public awareness, builds confidence with HOAs. WNR's revenue stream is based on investment decisions, allowing for flexibility in pricing based on the project's scope. Partnerships with a variety of organizations and experts, including municipalities and quality platforms like DNA, enhance WNR's expertise and resources, enabling it to provide high-quality services to its customers.

Weaknesses:

WNR's model has limitations in terms of its applicability to other customer segments and regions beyond its current focus. As such, it may not be able to capitalize on the growing demand for home renovation services in those areas. Additionally, the organization's revenue stream is based on investment decisions, which may introduce unpredictability and risk into its operations. This

reliance on external funding could potentially limit the organization's ability to expand its services or invest in new initiatives.

In addition, WNR's small team size and reliance on cooperation partners may hinder its capacity to expand its operations and meet the rising demand. While collaborations with municipalities and experts can enhance WNR's scope and impact, its non-profit status and emphasis on public awareness could restrict its competitiveness against for-profit competitors in the industry.

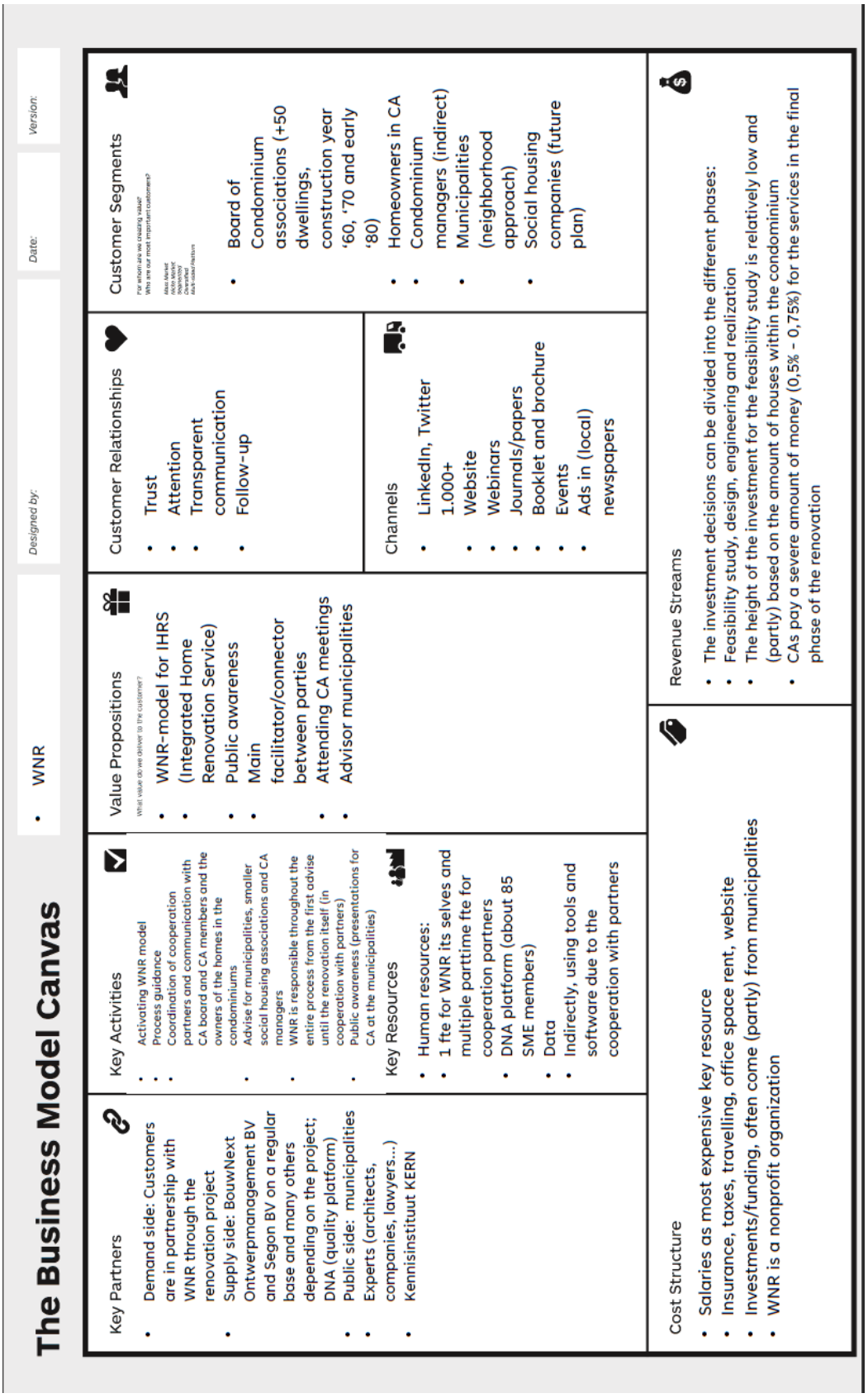

Figure 5: The Business model Canvas of WNR

City of Ostend

The BMC of the city of Ostend revolves around the value proposition of an IHRS, targeting HOAs. The IHRS aims to provide technical, social, and financial support throughout the renovation process, resulting in improved energy efficiency, comfort, property value, and maintenance. The city aims to create long-term plans for future-proof and fossil-free condominiums while stimulating the local market and ensuring clear communication with co-owners.

The customer segments include co-owners in condominiums. HOAs play a vital role as a group of main customers, and CMs act as intermediaries supporting these associations. The supply side, including contractors, engineering offices, architects, banks, and insurance companies, is also considered a customer segment.

Channels utilized by the city include governmental bodies such as VEKA, and Energiehuis Oostende, as well as first-line advisors, social media, websites, events, newsletters, local property managers, and municipal services. CondoReno partners and actors from the supply side also serve as channels for communication and information dissemination. Within a HOA, a project team will be established, consisting of the board and possibly motivated co-owners who have a technical or financial background. The project team plays an ambassador role and acts as a single point of contact for the other co-owners, the IHRS service provider and the CM.

The city aims to establish customer relationships based on trust and neutrality. They provide advice, support, and participation in HOAs project teams. CMs are offered connection and support through “Benovation” coaches, while the city acts as a communication channel for the supply side. A communication strategy, guide, and training are also provided to CMs.

The value streams for the city's IHRS are derived from the overall improvement of condominiums, including energy efficiency - and thus carbon reductions - comfort, increased real estate value, lower maintenance costs, and extended lifetimes. Operating funds of the City of Ostend & the Flemish Government are used to establish, maintain and sustain the IHRS. These are the revenue streams. Energy savings in the city, stimulating fossil-free heating solutions, and addressing energy poverty are additional benefits.

Key partners include beneficiaries, HOAs board, individual co-owners, policy actors, local and regional authorities, municipal services, administrative actors, CMs, technical and energy actors, and financial actors. Other intermediaries such as federations, non-profit organizations, and educational institutes are also considered potential key partners.

Key activities involve activation of the OSS advice & support model, facilitating the local market, integrating renovation measures over time, developing customer journeys for HOAs, providing guidance and support throughout the renovation trajectory, and offering communication tools to co-owners and CMs.

Key resources include the integration and optimization of Energiehuis Oostende's current services into IHRS, co-creation with the demand and supply side, and direct input on technical, financial, and social aspects. Furthermore, Energiehuis Oostende could benefit from the strong partnerships

that will provide the exchange of relevant knowledge, methods, lessons learned etc. Knowledge, time, and financial resources are also required for staff costs, development costs, and professional advice and support.

The cost structure involves costs related to knowledge, understanding the dynamics in a condominium and ever-changing incentives. It also includes costs associated with time, such as co-creating the IHRS model, activating the demand and supply side, validating the business model, and organizing the internal organization. Additionally, monetary costs arise from staff expenses, development expenses, and professional advice and support.

The plan for the current BM includes pilot projects, promoting IHRS during general meetings of HOAs, selecting pilot projects based on certain criteria, developing engagement letters to stimulate the involvement of co-owners in their own renovation project, and kick-starting pilot projects. It also involves co-creation, guidance and support by a benovation coach, stakeholder management, local focus groups, business matchmaking events, promoting the development of a Flemish communication strategy, masterplan optimization, developing questionnaires for co-owners, learning curves for engineering offices, and monitoring and implementing Flemish incentives for HOAs.

Strengths:

Value Proposition: The IHRS focuses on improving energy efficiency, comfort, property value, and maintenance of condominiums. By addressing these key aspects, the service delivers tangible benefits to customers, making it an attractive proposition.

Key Partnerships: The city has established partnerships with various stakeholders, including property managers, technical and energy actors, financial institutions, and policy actors. These partnerships contribute to the success of the IHRS by ensuring access to resources, expertise, and market reach

Weaknesses:

Limited Resources: The successful implementation of the IHRS relies on sufficient resources, including knowledge, time, and financial investment. Inadequate resources may hinder the scalability and effectiveness of the service, especially during periods of high demand.

Coordination Challenges: As the IHRS involves multiple stakeholders, coordination and collaboration among these actors may pose challenges. Ensuring effective communication and alignment of goals and actions across the network of partners requires continuous effort and coordination.

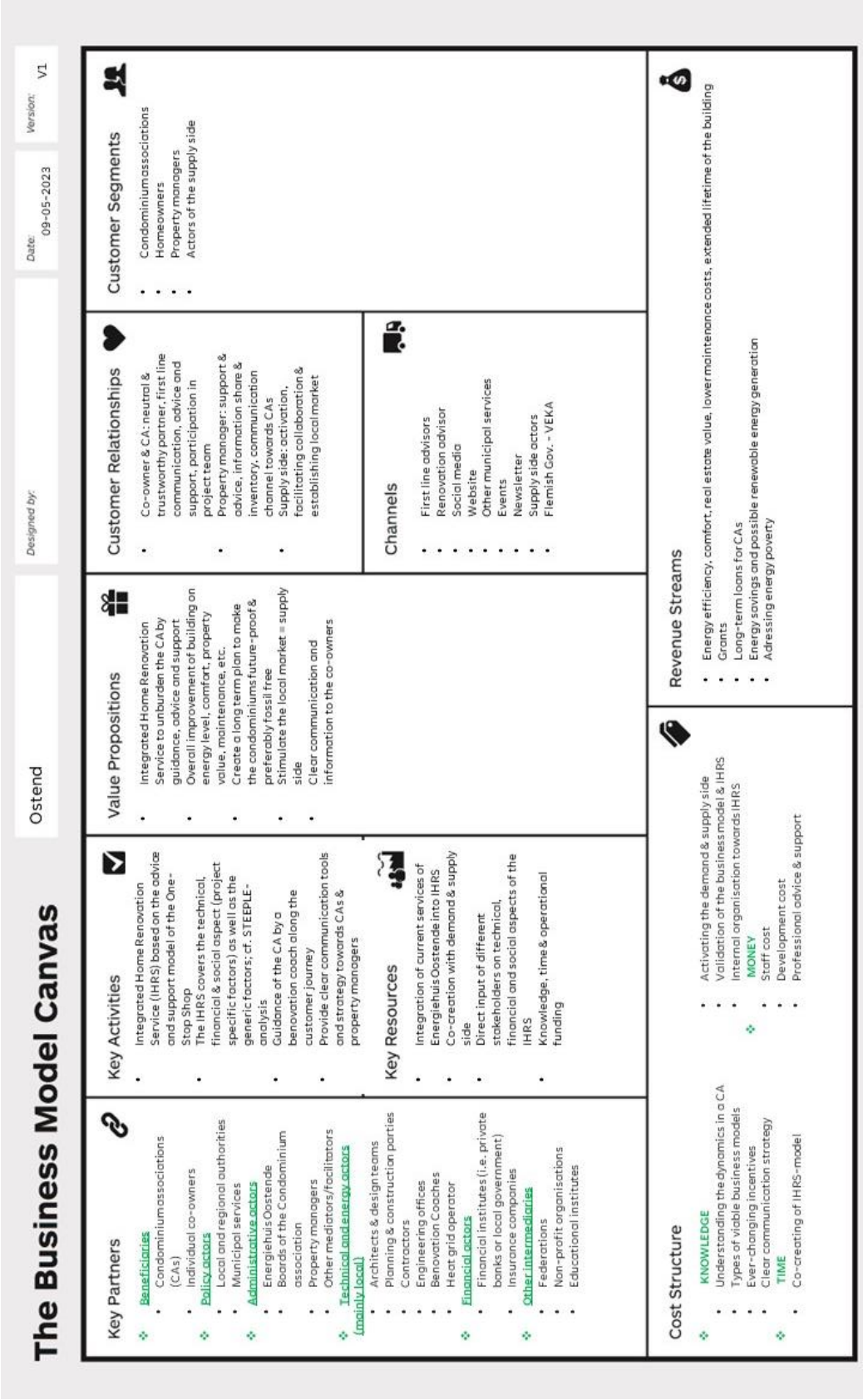

Figure 6: The Business model Canvas of the city of Ostend

Opportunities and Threats

There are general opportunities and threats for all of the five BMs to ensure their success in upscaling and up taking energy renovations targeting HOAs.

Opportunities:

The BMs of ANTW, MECH, APC, WNR and OOST have identified several opportunities to successfully upscale energy renovations targeting HOAs. The growing market demand for energy-efficient and sustainable renovations, coupled with the increasing emphasis on energy efficiency and sustainability, provides a significant growth opportunity. Moreover, supportive policies, incentives, and grants offered by the Flemish Government and local authorities encourage and facilitate these renovations. Building strong customer relationships, delivering personalized services, and establishing a positive reputation are key factors in these BMs success. Collaborations with municipalities, experts, and stakeholders enhance their reach, visibility, and expertise while providing opportunities for securing investments and funding. Leveraging digital marketing channels such as social media and online events improves customer engagement, expands the audience, and attracts new customers and partners. By capitalizing on these opportunities, the BMs can establish themselves as trusted providers of energy renovation services, meet market demand, and contribute to the sustainable transformation of condominiums.

Threats:

The five BMs face common threats that could impact their success in upscaling energy renovations targeting HOAs. Changes in government policies and regulations related to energy efficiency and sustainability pose a risk to their operations. Economic downturns and shifts in the consumer behavior can lead to a decrease in demand for their services. Additionally, competition within the industry and the potential emergence of new players offering similar services pose a threat to their market position. Lack of finance, energy poverty, and a scarcity of capacity and skills in the building sector are also common challenges they may encounter. Another common threat is the long time needed in the onboarding of new condominiums which costs the service providers lots of time, money and energy which may be economically not cost-effective. These threats highlight the need for these BMs to adapt to changing environments, navigate policy shifts, maintain a competitive edge, and address the evolving needs of their target customers.

Compared to the other models, WNR's model is a true market-driven model. This model has different funding channels and is therefore subject to different, rather financial risks for its operation. To achieve geographical scale-up of this type of activity, we can look for multiplication of the model and in such a large market there is no danger of competition.

3.1.2 Business model components for existing IHRS for condominiums (CondoReno Partners)

Table II: Business model building blocks of APC, ANTW, MECH, WNR and OOST

Building block	APC (BM1)	ANTW (BM2)	MECH (BM3)	WNR (BM4)	OOST (BM5)
Customer segments – Beneficiaries	Targets: HOAs, CMs City of Paris and homeowners	Targets: CMs Co-owners living in apartment buildings with more than 20 dwellings and older than 20 years Vulnerable groups Regional government	HOA board members CMs Homeowners (active approach of big and medium high-rise condominiums built before 2012 – passive approach of small HOAs) Regional government	Board of HOAs (+50 dwellings, construction year '60, '70 and early '80) Homeowners in condominiums, CMs (indirect) Municipalities (neighborhood approach)	HOAs Homeowners CMs Actors of the supply side
Value propositions	Works as a facilitator, local advisory reference, and energy advisor and gives technical support	Support for HOAs to make a renovation masterplan which includes: Building audit, Maintenance plan and an ambitious E60 renovation scenario Transparent overview of the costs Transparent advice throughout the entire process	Affordable energy renovation, tailored to the building, the HOA and the homeowners Lower energy bills Preserve or increase the value of the condominium / Appartements Ongoing renovation process	WNR model for IHRS Public awareness Main Facilitator/connector between parties Attending HOAs meetings Advisor municipalities	IHRS to unburden the HOA by guidance, advice and support Overall improvement of building on energy level, comfort, property value, maintenance, etc. Create a long-term plan to make the condominiums future-proof & preferably fossil free Stimulate the local market = supply side Clear communication and information to the co-owners
Channels	Federation of condo trustee, social media, CoachCoPro website, APC events, newsletter and municipalities papers	Events for HOAs Network with condominium managers Network with an expert team Website and email Webinars and conferences Promotion video	Online request form on website MKN Online newsletter MKN, an online newsletter for HOAs and condominium managers Personal letters, flyers Information on HOAs meetings Network events for HOA boards and managers Information sessions/webinars Conferences	LinkedIn, Twitter 1.000+ Website Webinars Journals/papers Booklet and brochure Events Ads in (local) newspapers	First line advisors Renovation advisor Social media Website Other municipal services Events Newsletter Supply side actors Flemish Gov. - VEKA

Table II: Business model building blocks of APC, ANTW, MECH, WNR and OOST (Continued)

Building block	APC (BM1)	ANTW (BM2)	MECH (BM3)	WNR (BM4)	OOST (BM5)
Customer relationships	Events: forum, visits, meetings. CoachCopro trophies, CoachCoPro as a numeric place and review	Trusted and neutral advisor Personal tailored service Transparent communication Solution focused co-creation	Trusted advisor Personal service tailored to the building and the characteristics of the Condominium and the homeowners Transparent communication Solution focused co-creation	Trust Attention Transparent Communication Follow up	Co-owner & HOA: neutral & trustworthy partner, first line communication, advice and support, participation in project team Property manager: support & advice, information share & inventory, communication channel towards HOAs Activation, facilitating collaboration & establishing local market
Revenue streams – Value streams	The City of Paris provides a 5000€ voucher for HOAs. The metropolitan area of the city supports HOA with a 10,000€ grant APC is a non-profit association (supported by the city of Paris and the metropolitan area) Energy saving certificates: The Agency gets paid by the Metropolitan area for the reduction of the carbon footprint through the sensibilization of local stakeholders and building retrofit	About 50 HOAs signed up for the masterplan approach 4 condominiums came to ambitious investment decisions (between 1 and 4 million euros) investment decision of +/- € 30.000 per dwelling, reaching a primary energy use of about 90kWh/m2.year	CondoReno grants VEKA – grants for the renovation coaches (possibly in 2024: VEKA – grants for the guidance of the HOAs to the renovation master planning) At this moment no payment is asked from HOAs for the services The City of Mechelen benefits from the renovation of condominiums since lower energy use means also lower CO2 emissions.	The investment decisions can be divided into the different phases: Feasibility study, design, engineering and realization The height of the investment for the feasibility study is relatively low and (partly) based on the number of houses within the condominium HOAs pay a severe amount of money (0,5% 0,75%) for the services in the final phase of the renovation WNR is a non-profit organization	Energy efficiency, comfort, real estate value, lower maintenance costs, extended lifetime of the building Improvement of the living environment of the inhabitants of Ostend Operating funds of the municipality and Flemish Government Grants Energy savings and possible renewable energy generation Addressing energy poverty
Key activities	CoachCopro provides technical support Administrative support for HOAs Contribute to the Local Urbanism Plan Annual event Execute studies Public awareness Events/webinars for experts Contribute to the political public (Financial support 5k voucher, Obligation to restore the front every 10 years) Professional training	Communication with the target group G1: Renovation masterplan for large apartment buildings G2: Free renovation guidance for ground-level houses and small apartment buildings Coaching the board of co-owners and condominium manager with the conduction of the masterplan study Financial coaching of the co-owners	Independent advice on energy renovation (small buildings) Referral to engineering offices for renovation master planning Low threshold information on + assistance in applying for loans and subsidies Coaching HOAs on their decision-making process Policy advocacy i.f.o condominiums Matching supply and demand side of condominium renovations	Activating WNR model Process guidance Coordination of cooperation partners and communication with the HOA board and members and the owners of the homes in the condominiums Advise for municipalities, smaller social housing associations and CMs WNR is responsible throughout the entire process from the first advise until the renovation itself (in cooperation with partners) Public awareness	IHRS is based on the advice and support model of the OSS The IHRS covers the technical, financial & social aspect (project specific factors) as well as the generic factors; cf. STEEPLE-analysis Guidance of the HOA by a benovation coach along the customer journey Provide clear communication tools and strategies towards HOAs & CMs

Table II: Business model building blocks of APC, ANTW, MECH, WNR and OOST (Continued)

Building block	APC (BM1)	ANTW (BM2)	MECH (BM3)	WNR (BM4)	OOST (BM5)
Key resources	Human resources CoachCopro Data from the city of Paris Tools to use for data and energy diagnoses Copyrights	Renovation coaching by the local government G1:2FTE G2: 1 FTE +5external coaches Grants (city of Antwerp): 50% (max 7.500) for the masterplan study + implementation to label B (200 till 100 kWh/m²/y) max 6.000€, to label A (100 kWh/m²/y max 12.000€; no gas heating max 4.000€ CRM tool Flemish loans and subsidies Network of experts for advice	Staff CondoReno project Co-operation with the renovation coaches Energiepunt Mechelen CRM tool Flemish loans and subsidies for HOAs Network of experts we can turn to for advice	Human resources: 1 fte for WNR its selves and multiple parttime fte for cooperation partners DNA platform (about 85 SME members) Data Indirectly, using tools and software due to the cooperation with partners	Integration of current services of Energiehuis Oostende into IHRS Co-creation with demand & supply side Direct input of different stakeholders on technical, financial and social aspects of the IHRS Knowledge, time & operational funding
Key partners	City of Paris Greater Paris metropolitan area National public service (France Renov) RATP (public transport operator) CPCU (district heating) and EDF (electricity) CSTB (Scientific & technical Building Centre) APUR (Paris Urbanism Agency) Demand side: Technical Direction of the Paris City Council Supply side: Building Retrofitting professionals Public side: Co-owners councils Intermediaries: Condominiums Trustees	Board of co-owners CMs Architects and engineers who conduct the studies Governments: Other services of the City of Antwerp (SBM, Vergunningen, Energie, woondienst, commuicatiedienst) Flemish Government (VEKA, Woonbeleid) > In terms of creating and adjusting policies for co-owners = Woonhaven Experts: Ar-Tur, Embuild, Pixii, Samenklimaatactief, BBL, ...	HOA board members and CMs United Owners BIV (Professional institute for real estate agents) Engineering offices (renovation masterplanning Klimaan (citizen movement and energy cooperative) AMO (Architects Mechelen and surroundings) Contractors Banks Other services of the City of Mechelen (urban planning, building departement, social welfare…) VEKA Fluvius Em'build, Pixii, Kamp C, BBL – Ecobouwers,… Lawyers with expertise in condominium law (* Expansion)	Customers are in partnership with WNR through the renovation project BouwNext Ontwerpmanagement BV and Segon BV on a regular basis and many others depending on the project DNA (quality platform) Municipalities Experts (architects, companies, lawyers…) Kennisinstituut KERN	Beneficiaries like: Homeowners associations (HOAs) Individual co-owners Policy actors Local and regional authorities Municipal services Administrative actors Energiehuis Oostende Boards of the HOA CMs Other mediators/facilitators Technical and energy actors (mainly local) Architects & design teams Planning & construction parties like: Contractors Engineering offices Benovation Coaches Heat grid operator Financial institutes (i.e. private banks or local government) Insurance companies Other intermediaries like: Federations Non-profit organizations Educational institutes

Table II: Business model building blocks of APC, ANTW, MECH, WNR and OOST (Continued)

Building block	APC (BM1)	ANTW (BM2)	MECH (BM3)	WNR (BM4)	OOST (BM5)
Cost structure	Human resources (Salaries): energy advisors' network Digital tools Financial support from the city of Paris to HOAs	Resources paid by Energiehuis Antwerp and through EU projects Technical studies paid by homeowners	Salaries of the Condo Reno project members Communication costs CRM tool global budget of Energiepunt Mechelen	Salaries as the most expensive key resource Insurance, taxes, travelling, office space rent, website Investments/funding, often come (partly) from municipalities	Understanding the dynamics in a HOA Types of viable business models Ever-changing incentives Clear communication strategy Co-creating of IHRS-model Activating the demand & supply side Validation of the business model & IHRS Internal organization towards IHRS Staff cost Development cost Professional advice & support

Discussion

The results indicate that BM1, BM2, and BM3 target homeowners and HOAs as primary customer segments, whereas BM4 solely focuses on HOAs. It's worth noting that private and public providers tend to consider CMs as a segment, which differs from municipal providers that also target vulnerable groups. This distinction could be attributed to different interests and scopes between private, public, and governing institutions. BM5 similarly emphasizes customer segments that include HOAs, homeowners, CMs, and actors on the supply side.

Regarding the proposed value, all five providers share the value of facilitating energy renovations for HOAs. Each service provider employs a mix of different channels to reach their customer segments. All BMs utilize online platforms, such as social media and webinars, and prioritize transparent communication to maintain positive customer relationships. BM1 engages through forums, HOAs visits, and a digital platform, while BM4 focuses on attentive support and provision of guarantees. BM2, BM3, along with BM5, additionally emphasize a solution-focused approach for energy renovations to HOAs. BM3 actively involves customers in the co-creation process.

Moving into the revenue streams or the "Value Streams", BM1, BM2, BM3, and BM5, rely on grants as a primary revenue source, while BM4 generates income through investment decisions made at various stages of the renovation process. For the key activities, all five providers offer advice and assistance as the main key activity to their customers.

For the key resources, all five providers have human resources working part- or full-time on providing and promoting energy renovations, especially for HOAs. However, they differ in their reliance on data and tools. All the BMs use local data as a key resource and rely on the integration of current services into the IHRS. BM5 additionally emphasizes co-creation with the demand and supply side as a key resource.

Regarding key partnerships, all providers collaborate with various stakeholders such as architectural firms, local authorities, and other experts. Municipalities, as in the case of BM2, BM3, and BM5, tend to work closely with CMs and HOA board members to positively engage with homeowners.

In terms of the cost structure, all five providers allocate costs for salaries and investments, with differences in their specific cost allocations. BM5, like BM1, BM2 and BM3, invests in energy advisors and CRM tools, highlighting the commitment to providing comprehensive support for energy renovations.

These similarities and differences highlight the diverse approaches taken by the five providers, culminating in the emergence of three typologies of business models for HOAs, namely the public climate agency model, private energy renovations model, and municipal support and growth model.

3.2 Existing IHRS for condominiums in the EU

During our research at TU Delft, we explored not only the CondoReno partners' BMs but also extensively explored a variety of BMs implemented by notable organizations. Our investigation extended to Dutch municipalities such as Rotterdam (Save the Homes https://savethehomes.net/), Amsterdam, and The Hague, as well as entities like Homegrade https://homegrade.brussels/nl/ (Brussels). Moreover, we scrutinized BMs originating from EU projects like STUNNING(https://cordis.europa.eu/project/id/768287), Padovafit Expanded (https://www.padovafit.eu/home.html), I-Heros (https://i-heros.eu/), ProRetro (https://proretro.eu/en/), and ABRACADABRA (https://cordis.europa.eu/project/id/696126). To provide a comprehensive overview, we also investigated the operations of current OSSs such as Hauskunft (https://www.hauskunft-wien.at/) in Vienna, Austria and Oktave (https://www.oktave.fr/) in France. In the subsequent section, we will offer a succinct summary of the BMs adopted by these diverse entities, shedding light on their approaches to catalyzing energy renovations and fostering sustainable practices within HOAs.

Rotterdam (based on Save the Homes project)

The city of Rotterdam aims to address energy poverty among middle and working-class single-family households through a BM that emphasizes a straightforward and accessible renovation process. Their approach focuses on improving comfort by reducing energy losses, enhancing air quality, and overall well-being, leading to lower energy bills and increased property value.

Customer segments and Channels: The target audience comprises homeowners facing energy poverty, and the city employs both offline and online channels for communication, including home visits, campaigns, neighborhood meetings, websites, and social media.

Customer Relationship: The city builds relationships through dedicated personal assistance, community engagement, and collective procurement initiatives. The goal is to establish trust and provide assistance tailored to individual needs.

Revenue Streams "Value streams": Short-term revenue is generated through EU funding, while long-term sources include national, provincial, and municipal funding, EU facilities, revenue from solar roof projects, and premium services such as tailored solutions, financial advice, and Community Energy Service Company (Community-ESCO).

Key Activities: Activities involve social, technical, and administrative aspects. These include developing partnerships, promoting citizen participation, conducting home visits and energy diagnoses, providing personal renovation measures, managing contractor relationships, and offering administrative support.

Key Resources: Key resources include personnel, physical and online offices, brand credibility, a list of contractors, supporting tools, and customer tools such as energy efficiency factsheets and the IkWoon application.

Partnerships: Key partners include the municipality of Rotterdam, contractors, installers, architects, Energie van Rotterdam, Bouwhulp Groep, Woonwijzerwinkel, EnergieSamen, and Speeltuin Lage Land. These partnerships contribute to credibility, execution of renovation work, additional revenue streams, and various forms of support.

Cost Structure: Costs are allocated to personnel, physical office (not initially), web domain, marketing and communication actions, and ICT tools.

The city's BMs integrate social, technical, and administrative components, creating a holistic approach to address energy renovations and alleviate energy poverty among middle and working-class homeowners in Rotterdam.

Amsterdam

The city of Amsterdam has set goals to make their condominiums more sustainable, as 53% of homes in Amsterdam are part of a HOA and sustainability is an opportunity for condominiums to address maintenance, improve housing quality, provide an affordable future for residents and prepare for a gas-free condominiums.

Customer Segments: The city of Amsterdam targets homeowners in condominiums, specifically in the lower- and middle-income groups, who are experiencing energy poverty.

Value Propositions: The primary value propositions include the reduction of energy poverty, decreasing dependence on fossil fuels, offering tailored advice to condominiums, providing information, supporting condominiums through a neighborhood-oriented approach, and offering extra assistance and funds for specific parts of the city.

Channels: The city employs both online and offline channels for communication. Online channels include the website, webinars, newsletters, and invitations. Offline channels involve information evenings, housing type evenings, and design collaboration sessions.

Customer Relationship: The city aims to be a trusted and neutral advisor, providing personalized services tailored to the building and the characteristics of the HOA and homeowners. Communication is transparent, and there is a focus on solution-oriented co-creation.

Revenue Streams: The main revenue streams for the city come from the goals of reducing energy poverty and decreasing dependence on fossil fuels.

Key Activities: Key activities include providing tailored advice to condominiums, offering information, and supporting condominiums through a neighborhood-oriented approach. The municipality also conducts mandatory courses for condominiums to qualify for subsidies.

Key Resources: The city currently employs 5 FTE dedicated to assisting condominiums in becoming more sustainable. While there are no specific digital tools mentioned, the municipality website serves as a digital resource.

Key Partners: Key partners include various stakeholders such as architects, engineers, lawyers, and the housing advisory organization !WOON, boards, housing corporations, and internal collaboration with entities like ETGO, boroughs, and sustainability coordinators.

Cost Structure: The city allocates costs for human resources, activities, and other associated costs to implement and sustain the energy renovation initiatives.

The city of Amsterdam adopts a comprehensive approach to reducing energy poverty and dependence on fossil fuels, emphasizing tailored advice, neighborhood-oriented support, and collaboration with diverse partners and stakeholders.

The Hague

About 90% of the HOAs in the Hague are small (less than 8 apartments) and the buildings often have a label G. The municipality tries to help the HOAs in the city by providing Municipal subsidies, a sustainability fund for interest reduction for loans from the Heat Fund ("Warmtefonds") and a local desk support.

Customer Segments: The Municipality of The Hague targets HOAs, homeowners, and CMS.

Value Propositions: The value propositions include immediate savings promotion -Direct Bespaar Actie (DBA), Roofhunt for solar panels, providing advice to HOAs on maintenance and improvements, sustainability and maintenance services, and facilitating block renovations by connecting Homeowners associations.

Channels: Communication channels include social media, events, the municipality's website, municipal papers, direct contact with CMs, newspapers, and networking activities.

Customer Relationship: The municipality establishes and maintains relationships by directly contacting CMs, participating HOAs board meetings, and engaging in discussions to provide support.

Revenue Streams: Revenue is generated through upgrading the housing label/quality, leading to an increase in the WOZ value and subsequently higher taxes. Additionally, certain services are offered free of charge.

Key Activities: Key activities involve creating awareness among CMs, providing advisory reports, presenting reports to HOAs, and moderating discussions within HOAs meetings.

Key Resources: Key resources include a OSS in Mariahoeve, three full-time FTEs dedicated to the initiative, funding from the EU and the municipality, and data for analysis.

Key Partners: Key partners include various stakeholders such as architects, lawyers, and renovation coaches, fostering collaboration for the success of energy renovation initiatives.

Cost Structure: Costs are allocated for paid salaries, maintaining the physical office of the OSS, advertisements, and promotional prints to support awareness and engagement efforts.

The Municipality of The Hague's BM focuses on engaging with HOAs, homeowners, and managers, offering a range of value propositions, leveraging various communication channels, and collaborating with key partners to drive energy renovations and increase the overall sustainability of housing in the city.

Vienna (Hauskunft OSS)

The OSS Hauskunft was initiated by the city of Vienna "wohnfonds_Wien" to help Viennese homeowners to renovate their homes with the main goal "Raus aus Gas" to make buildings gas free by 2040 as a city goal. The city has already helped in renovating around 100 projects (January 2023). The OSS provides free advice, a quality platform and helps homeowners in applying for subsidies (*Die Sanierungsberatung für Häuser mit Zukunft.*, 2023).

Customer Segments: The OSS primarily targets homeowners and CMs.

Value Propositions: The value propositions include orientational advice, free advice, independence in recommendations, and assistance in obtaining subsidies from Wohnfonds.

Channels: Communication channels encompass online services, social media, telephone communication, physical OSS in the city center, and property visits.

Customer Relationship: The customer relationship is fostered through a future check, engagement in the HOA's decision-making process, and a commitment to providing helpful and independent advice.

Revenue Streams ("Value Streams"): The primary value stream involves helping Viennese homeowners transition their houses to be gas-free.

Key Activities: Key activities include providing advice as first orientation advice and on creating a renovation concept, raising public awareness about energy renovations, and managing connections between homeowners, professionals, and companies.

Key Resources: Key resources include a city center office, human resources consisting of 10 experts working in the Hauskunft office, and informational materials such as flyers, brochures, and booklets.

Key Partnerships: Key partnerships involve collaboration with local area renewal offices (Magistrat) and a quality platform that offers information about professionals and companies capable of executing renovation concepts.

Cost Structure: The main cost is associated with the salaries of experts employed by the OSS (Hauskunft).

The Vienna OSS Hauskunft BM centers around providing homeowners and CMs with valuable advice, and assistance in securing subsidies and facilitating the transition to gas-free houses. Key activities involve public awareness and managing connections, while key resources include a dedicated office and a team of experts. Strategic partnerships with local renewal offices and a quality platform contribute to the success of Vienna's energy renovation initiatives.

Brussels (Homegrade OSS)

Homegrade is an OSS initiated by the city of Brussels in 2017 aiming to assist homeowners in Brussels with their renovation needs and provide them with the necessary information and support to make informed decisions. About 60% of the housing units in Brussels are condominiums (*Home Grade*, 2023).

Customer Segments: The OSS primarily targets private homeowners and small condominiums.

Value Propositions: The value propositions include assistance and support for home renovation projects in Brussels. Preserve and improve the quality of life and the environment of Brussels residents. Provides support to homeowners on the priorities of the different phases of the renovation and technical, financial, and administrative support.

Channels: Communication channels encompass online services, social media, telephone communication, website and a physical OSS.

Customer Relationship: The customer relationship is fostered through neutral and transparent advice to homeowners in diverse forms: home visits, document analysis, office appointments,..etc

Revenue Streams ("Value Streams"): Homegrade has answered 24.000 demands and provided depth support for more than 6000 homeowners in 2023. Homegrade is 100% funded by the Brussels government and offers all services free of charge.

Key Activities: Answering any questions related to the use and renovation of private homes. Homegrade provides also in-depth coaching for homeowners. Homegrade also works in close collaboration organizing several workshops, webinars, and meetings with various stakeholders and target groups. Participation in pilot projects, initiatives, and working groups. Helping homeowners in applying for grants.

Key Resources: Key resources include a physical office, CRM tools, human resources consisting of more than 45 experts, and informational materials such as flyers, brochures, website, publications and booklets.

Key Partnerships: a network connecting renovation professionals and target groups was established by the OSS to build trust. A working group consisting of public administrations, the private and associative section was created to better coordinate the multitude of players on the supply side.

Cost Structure: The main cost is associated with the salaries of experts employed by the OSS and an interactive website that has been recently relaunched.

Homegrade is an organization that provides assistance and support for home renovation projects in Brussels. They offer various services and resources to help homeowners navigate the administrative procedures and simplify the renovation process. Homegrade's tools and advisors can guide individuals through the necessary steps for improving their homes. They also provide regularly updated publications, fact sheets, webinars, and online tools to educate homeowners about renovation and improvement options. Additionally, Homegrade offers a contact form for individuals who need help with their renovation projects and don't know where to start. Overall, Homegrade aims to assist homeowners in Brussels with their renovation needs and provide them with the necessary information and support to make informed decisions.

Oktave OSS

Oktave is OSS created by the Grand Est Region and ADEME in France since 2018 aiming to assist homeowners with their renovation needs and provide them with the necessary information and support to make informed decisions (*Oktave - rénovation énergétique et les aides région Grand Est*, 2023).

Customer Segments: The OSS primarily targets private homeowners, HOAs, Landlords and CMs.

Value Propositions: The value propositions include All-inclusive energy retrofits for homes. Personalized financing solutions for energy retrofits.

Channels: Communication channels encompass online services, 1-hour technical telephone communication, a website and a physical OSS.

Customer Relationship: The customer relationship is fostered through neutral and transparent advice to homeowners. And home visits for energy audits.

Revenue Streams: Oktave is a public-private company that has its revenue from condominiums and homeowners. They are supported by the regional government to be able to carry out more work. Their revenue from a condominium starts from 5k to 30k. Their revenue from single family houses starts from 4k to 6k.

Key Activities: Technical calls and home visits for energy audit. Providing support to homeowners in each phase of the customer journey

Key Resources: Human resources consisting of more than 45 experts (2023)

Key Partnerships: SMEs, Engineers and Architects, Banks and local authorities

Cost Structure: costs are mainly allocated to salaries and activities to carry out the renovation works.

Oktave aids in all phases of the renovation project, from the initial visit to studying the project and defining a budget to signing a support contract and consulting partner companies for coherent quotes. The service also includes a dedicated advisor who ensures the smooth progress of the renovation project and oversees the adherence to the initial specifications. Oktave works with certified professionals who are trained in energy-efficient renovation and selected for their expertise and skills. Oktave aims to optimize the financing of renovations through loans, Oktave grants, and access to Eco PTZ (Eco Loan at Zero Interest). The OSS hasn't yet reached a financial balance (2023) that's why it still depends on the funds from the Est Region to be able to carry out more work.

Business models from Padova fit Expanded

PadovaFIT Expanded is an EU project that aims at creating and piloting a OSS for home renovation services in Padova, Italy, and expanding the process to Timisoara, Romania, and the cities of Smolyan and Vidin in Bulgaria. The project aims to address the fragmented demand and supply in the home renovation sector by bringing together all players involved in the renovation process through a holistic approach. The project aims to identify enabling conditions and EU best practices for financially sustainable home renovation service schemes, reduce the information gap in the residential energy refurbishment sector, improve standardized technical procedures, enhance financing conditions for energy renovation investment plans, develop and implement an OSS for home renovation services, and remove barriers limiting the implementation of effective and sustainable IHRS.

The following summarizes the BM of the OSS in Padova fit Expanded (Croci et al., 2020):

Customer Segments: Direct customers that include homeowners, tenants, social housing entities and condominiums. Indirect customers include professionals on the supply side. The new customers segment may include public authorities and other agencies that are willing to implement an OSS in other cities.

Value proposition: the value proposition can be summarized as follows; 1. direct and easy access to information, 2. consultation services and decision-making support, 3. easy access to public

documents, 4. direct and easy connection between supply and demand, and 5. monitoring and follow-up services

Channels: Website, office, newspapers and local events

Customer relationship: a self-service service that provides online tools and information that can help homeowners get a free consultation and personal assistance through the OSS that consists of energy audit, building inspection, market players suggestions, contract drafting, and monitoring of results.

Revenue streams: the services at the beginning of the OSS launch are covered by public funds, in a later stage the information will stay free of charge, but the consulting services and monitoring services will be with a fee to be paid by the homeowners. Other revenues will be maintained from training courses that could be provided to other entities interested in developing an OSS in their region.

Key activities: managing the website and digital online tools. Technical and legal consultant services. Marketing and communication activities and know-how and sharing activities are the main key activities

Key resources: Human resources, offices, digital resources and technical equipment, network partners, economic resources like public funds and the know-how developed by funders.

Key partnerships: Funder and main partners. The external board consists of various stakeholders on the national and local levels like public agencies, chambers of commerce, professional boards, universities, general contractors and public actors. Financial institutions like banks.

Cost structure: Costs are mainly allocated to salaries, digital tools and website, marketing, office rent and equipment.

This is a short summary of the BM developed in the Padovafit expanded project. More information can be found on the website of the project here https://www.padovafit.eu/home.html

Business models from ProRetro

ProRetro is an ongoing Horizon 2020 project that aims to overcome barriers to residential energy efficiency renovations by offering new OSS services to customers in five German cities/regions. These services cover the entire customer journey of a building renovation, including audit, advice, planning, contracting, implementation, monitoring, and approval. The objective of ProRetro is to simplify and facilitate energy-saving renovations of buildings by providing a single point of contact for all tasks associated with the renovation process. The project also aims to involve relevant stakeholders and experts in the service offer and prepare for the continuation of the OSSs beyond the project lifetime (Kaselofsky et al., 2022)

The following summarizes the similarities and differences of the 5 BMs from ProRetro:

Customer segment: all BMs target condominiums and private homeowners. BMs from Berlin and Wuppertal target condominium managers as the main target group.

Value Proposition: all BMs provide independent consultation for homeowners, mediation of relevant service providers and tailored support. The BM of Berlin focuses on Quality management while the BM of EABB acts more as a coordinator between homeowners and other stakeholders

Channels: all BMs of the five OSS use almost the same channels to reach their customer segments, they use social media, websites, flyers and posters, municipal events, TV and local newspapers.

Customer relationships: all BMs provide free individual and personal advice to gain trust from the homeowners. The BM of ICM gives ten-year energy advice to homeowners after renovation.

Revenue Streams: the BMs from Berlin, EABB and ICM depend mainly on funding from EU projects and municipal funding. While the BMs from Hanover and Raumfabrik charge homeowners for some services.

Key Activities: all BMs provide support and advice to homeowners as a main key activity. The BM from EABB helps homeowners in the financing process, searching for craftsmen, in the decision to take measures and to regular acquisition and public relations work as a main activity to assure success. The BMs from Berlin and Hanover try to define quality standards as one of the main activities.

Key resources: all BMs have experts who have experience in energy renovations. And connections with contractors and various stakeholders

Key partnerships: the BMS of Berlin, Hanover, EABB and ICM tend to collaborate with local and public entities like municipalities. All BMs tend to collaborate with energy advisers and financial institutions. The BMs from Berlin and Hanover collaborate with Architects. the BMs from EABB and Berlin tend to collaborate with Property managers.

Cost structure: all BMs allocate costs for salaries, office rent, online platforms and all costs related to the activities that need to be done.

This is a short summary of the BMs developed in the ProRetro project. The project started in 2020 and is still ongoing. More information can be found on the website of the project here https://proretro.eu/en/

STUNNING

The STUNNING project (Laffont-Eloire et al., 2019) was a EU-funded initiative that aimed to promote the adoption of energy-efficient renovation practices for buildings. The project sought to overcome

the barriers to energy-efficient renovation by providing a repository of best practices, a toolkit for renovation, and an online platform for sharing information. The project aimed to investigate novel and innovative financing models for energy-efficient renovations. The financing models included Energy Performance Contracting (EPC), On-Bill Financing (OBF), Green Mortgage, and Crowdfunding. EPC involves energy service companies (ESCO) providing energy-efficient renovation services to a building owner, with the cost of the renovation being repaid through the energy savings achieved. OBF involves the energy supplier providing financing for energy-efficient renovations, with repayment through the building owner's energy bills. Green Mortgage provides a mortgage that includes financing for energy-efficient renovations, with the cost of the renovation added to the mortgage. Crowdfunding involves raising funds from many individuals to finance energy-efficient renovations.

The STUNNING project aimed to address the main barriers to renovating the EU building stock and promote sustainable European BMs for deep renovation. The project followed a three-stage approach: 1) the creation of a database on renovation packages, 2) the identification of barriers in the renovation sector and, 3) the promotion of promising BMs and innovative case studies. The project developed a Knowledge Sharing Platform called Renovation Hub to share relevant information among a stakeholder community composed of multiple types of actors (D'Oca et al., 2019).

The BMs were structured in four blocks: What? Who? How? Why? Each block contains a description of the value proposition, target customer, value chain, activities, resources, revenue model and cost structure, which are the building blocks generated by Osterwalder (Osterwalder et al., 2005). The project focused on identifying and evaluating innovative BMs for key stakeholders in the construction sector, resulting in the creation of a structured BM database.

Four main families of BMs were identified. The families and sub-categories were evaluated according to their coverage and capacity to achieve European targets. BMs are often a combination of several patterns, and combining patterns can provide a more robust BM (Laffont-Eloire et al., 2019).

The project analysed several innovative BMs for deep renovation in Europe, including the OSS concept provided by Private-Public Partnership and based on a step-by-step approach, Product Service Systems and Energy Service Companies such as Energy Supply Contracting and Energy Performance Contracting, new financing schemes such as Energy savings obligations and On-bill financing, and new and innovative revenue models like Vertical extension and Crowdfunding. These BMs were promoted through the Renovation Hub, webinars, and other events. Results from the BM analyses showed that successful models should move risk and financial expenses from owners to institutional investors or banks while highlighting the non-energy benefits to decrease risk and payback time. A successful BM can be user-centred, focus on the multiple benefits of energy renovation such as comfort and health after renovation, and develop collaboration models at all levels of the value chain.

ABRACADABRA

ABRACADABRA is an H2020 initiative to stimulate a market for the profound renovation of current buildings by incorporating volumetric additions (Add-ons) to shorten the investment payback period. The effectiveness of this strategy has been assessed through multiple pilot case studies. The project specifically investigates the social housing sector, using cost-effectiveness analysis to examine whether a retrofit approach that integrates add-ons and densification could accelerate the renovation of both publicly and privately owned housing stocks.

ABRACADABRA has demonstrated the viability of the Add-ons strategy (Dijiol et al., 2018) as a pragmatic solution for housing associations engaged in renovating their buildings. This strategy, referred to as "optoppen" in Dutch, presents itself as a valuable proposition that service providers within the IHRS framework can extend to condominiums. However, the implementation of this strategy faces a notable challenge known as the split incentive dilemma. Specifically, the alteration in the deed of division among homeowners necessitates a clear legal framework. It is imperative to address and resolve this issue within the legal structure to incentivize and enhance the incorporation of such values into the BMs of IHRS providers targeting HOAs.

RenoseeC

RenoseeC stands as one of the ten Living Labs on dwelling renovations in Flanders, subsidized by VLAIO. Through the utilization of a comprehensive catalog encompassing technical, financial, and legal solutions, RenoseeC is undertaking a collective renovation initiative involving twenty houses. The primary objective is to enhance the quality of life for homeowners and residents while concurrently improving the energy performance of their buildings in an affordable manner. Specifically targeting socially deprived neighborhoods, the RenoseeC project is dedicated to renovating homes for various demographic groups, with a particular focus on low-income families and tenants. Following the renovations, the project aims to formulate a business model and extend its impact by scaling up to other neighborhoods or cities (Heuts & Versele, 2016).

The BM, evolving step by step with involved partners, addresses five challenges: optimizing the collective approach, cooperating with the supply side, strengthening the demand side, reaching vulnerable groups, and ensuring scalability and reproducibility. Lessons learned so far include the success of the collective approach in terms of participant numbers, the importance of cooperation between social and technical partners, the need for unburdening elements to motivate participation, and the significance of tailored approaches to reach vulnerable groups. The project also emphasizes the importance of a trustworthy, independent partner and a structured roadmap for participants. Future plans involve upscaling the project, evaluating the collective approach's success, and refining the business model.

3.2.1 Conclusion

Based on the analysis of various BMs in European cities and from EU projects, the following are key lessons learned:

1. Simplification and Accessibility:

- Simplify and make renovation processes more accessible to homeowners.
- Streamline administrative procedures to encourage participation.

2. Comprehensive Communication Strategy:

- Utilize a blend of online and offline channels to effectively reach diverse customer segments.
- Emphasize transparent and solution-oriented communication.

3. Customer-Centric Approach:

- Foster strong customer relationships through personal assistance and active community engagement.
- Tailor services to the specific needs of individual homeowners and condominiums.

4. Diverse and Sustainable Revenue Streams:

- Develop diverse revenue streams including public funding, private investments, and service fees.
- Explore innovative financing options like green mortgages and crowdfunding.

5. Holistic Service Offering:

- Provide a range of services covering all aspects of renovations, from initial audits to implementation and follow-up.
- Offer comprehensive advisory services, including financial, technical, and legal consultation.

6. Focus on Energy Efficiency and Sustainability:

- Prioritize actions that improve energy efficiency and reduce reliance on non-renewable energy sources.
- Promote the benefits of sustainability, such as lower energy bills and increased property value.

7. Strong Partnerships and Collaboration:

- Build strong partnerships with local authorities, contractors, financial institutions, and other stakeholders.
- Leverage these partnerships for expertise, credibility, and resource sharing.

8. Targeted Approach to Vulnerable Groups:

- Specifically address the needs of vulnerable groups, including low-income families and energy-poor households.

- Implement tailored approaches to reach and assist these groups effectively.

9. Integration of Technology and Tools:

- Utilize digital tools and platforms for information dissemination, customer engagement, and project management.
- Leverage technologies like energy audits and renovation planning tools to enhance service quality.

10. Scalability and Reproducibility:

- Design business models that are scalable and can be replicated in different contexts or regions.
- Learn from pilot projects and adapt strategies for broader implementation.

11. Continuous Learning and Adaptation:

- Regularly evaluate and adapt BMs based on feedback and changing market conditions.
- Stay informed about new trends, technologies, and regulatory changes in the energy renovation sector.

These lessons highlight the importance of a customer-focused, adaptable, and collaborative approach in developing successful BMs for energy renovations in HOAs.

3.3 Assessment of business models (CondoReno Partners)

3.3.1 Current situation

City of Antwerp

In Antwerp and its districts, efforts have been made to extend support for renovation plans in single-family and multi-family houses. A new initiative involves the establishment of a service point where CMs, HOAs or apartment owners can seek assistance with various aspects of the renovation of their buildings. Recognizing the legal, technical, financial and social challenges faced by apartment buildings during refurbishment, the aim is to provide tailored support through this service. In addition, webinars are organized to disseminate information, for example for landlords. Exploring different topics and formats to reach and empower a wider audience is part of the ongoing search for effective ways to disseminate information.

City of Mechelen

Since the start of the OSS for apartments in December 2023, the City of Mechelen has focused on expanding the information and facilitation model. The city has created web pages on the website https://klimaatneutraal.mechelen.be/ with information about renovating apartments. Co-owners and CMs can find information about renovation master planning and renovation guidance, loans and grants for HOAs and co-owners, solar panels on apartment buildings, and so on.

In addition, the city has invested in personal contacts with HOAs and CMs, especially in the medium and larger apartment buildings in Mechelen territory. They were introduced to the support offered

by the City of Mechelen, through information sessions. The first information session was in April 2023 and had 'Solar panels on apartment buildings and energy sharing' as a topic. Over 100 co-owners participated. Most of them also subscribed to the newsletter for co-owners and syndicates. This online newsletter was published twice in 2023.

The city also had personal introductory meetings with the professional syndicates of the medium and large buildings. The city organized a well-reviewed networking lunch in early December 2023. Here, syndicates could exchange experiences among themselves and with the city around a substantive topic.

HOAs from large and medium-sized buildings were guided towards the VEKA framework contract for renovation master planning. Currently, about 10 HOAs have already shown interest or applied. Smaller apartment buildings, up to 6 to 8 residential units, get renovation advice from the renovation coaches who also advise owners of regular dwellings.

City of Ostend

Before CondoReno was launched, there was no renovation guidance program in Ostend. In the city of Ostend, the IHRS was set up completely from scratch since the start of the project. This service - targeted at the HOAs - focuses mainly on three aspects: technical, financial and social. These are also the three variable aspects that are project-dependent and form the baseline for a given project. The service starts from a long-term perspective of the apartment building in the form of a renovation master plan.

In cooperation with ANTW and MECH, a Flemish flowchart for the guidance process was developed. Parallel to this flowchart, a communication strategy is being developed. The main focus is on making the CA self-reliant and autonomous by developing training courses, training materials and reference documents for this purpose. During the development of the integrated renovation service, the existing offer around loans and premiums were included. As a result, an OSS model focusing on advice and support for the HOAs will be established in Ostend.

WNR

The current situation at WNR has not undergone significant changes since the completion of the BMC in January 2023 (Mlecnik, 2021); it mirrors the conditions when operations commenced in June 2020. Following the assessment conducted in May 2023, WNR BM has seen some incremental development.

The assessment played a crucial role in identifying gaps and determining the needs of WNR. The foremost realization was that the key activities, the WNR model, proved too narrow and specific to be the sole foundation of WNR operations. Specifically tailored for HOAs with buildings constructed between 1950 and 1975, the WNR model requires substantial investments in feasibility studies. As a result, it is only financially viable for larger complexes, typically comprising more than 40 apartments in structures like porch houses and gallery flats.

Recognizing the limitations of this approach, WNR acknowledged the challenges of finding suitable HOAs in the market with these specific criteria. To address this, it became evident that collaboration with companies offering comprehensive solutions for various HOAs was essential. By partnering with such entities, WNR aims to focus on more challenging cases, leaving the broader spectrum of projects to our collaborators. This strategic shift positions WNR to better navigate the market and serve a wider range of HOAs effectively.

3.3.2 What is needed and missing in the business model?

City of Antwerp

The city of Antwerp will further focus in 2024 on accelerating the renovation process to exponentially increase the number of successful renovations. One possibility is to facilitate cross-pollination between apartment buildings or CMs involved in a renovation project and those looking to initiate one. The city will seek to minimize its role as a city in the project and work on tools that promote greater self-sufficiency among interested property owners. Also, the city will engage in establishing contacts with stakeholders on the supply side, including architects, contractors, and other construction professionals, as well as energy efficiency experts. This is to gain a better understanding of the subsequent steps in our customer journey and to identify areas for improvement and acceleration.

City of Mechelen

In 2024, the City of Mechelen will focus on further developing the OSS from the information/advisory model towards a coordination model, with a step-by-step approach for the renovation. To this end, the city will establish contacts with actors from the supply side (including architects, contractors, other building professionals, and energy efficiency experts) (Q1 of 2024). With the supply side, the options for a smooth transition from the planning phase to the implementation phase will be explored in a focus group (Q2), together with their needs for support from the city.

Due to the growing demand for HOAs of small and medium buildings, the City of Mechelen has decided that one of the renovation coaches can specialize in providing renovation advice to small and medium-sized low-rise apartment buildings. For the financial planning of renovation work on such buildings, the city will experiment with the tool developed by Dubolimburg for this purpose within the European C-real project.

City of Ostend

The current BM focuses primarily on one-way and two-way communication. The development of a communication strategy plays a central role here. In addition, training materials and tools should be developed at the Flemish level to simplify the work processes of the Flemish energy houses while minimizing the workload. The further development and optimization of the current (and initial) integrated services is an iterative process, in which the lessons learned from the pilot projects can provide an adjustment to the current services.

WNR

The upcoming development at WNR involves the introduction of a new product slated for launch at the beginning of 2024—process guidance. This guidance is rooted in the manual (Roadmap), offering a versatile solution that caters to a broad target group. Essentially, every HOA may find value in this new offering, enabling WNR to actively participate in municipal tenders. Moreover, the flexibility of this product allows WNR to engage with HOAs that may not align with the specific requirements of the current WNR model.

Incorporating process guidance into WNR suite of services is not merely an addition but a significant evolution that will impact several components of the BMC. The initial adjustments will likely involve the Value Proposition, ensuring that it aligns with the enhanced offerings. Additionally, there is an optimistic outlook that the introduction of this new product will also influence the Revenue Streams, providing potential for diversification and growth.

As we move forward with the implementation of this innovative product, careful reassessment and adjustment of the BM will be imperative. This ensures that WNR BM accurately reflects the changes brought about by the introduction of process guidance, setting the stage for continued success and adaptability in the evolving landscape of energy renovations for HOAs.

3.3.3 Block tools, tools needed, financial arrangements needed

Exploring and identifying tools that assist in the execution, management, and financing of energy renovations for HOAs is crucial for enhancing the efficiency and effectiveness of such projects. While tools like CoachCopro and the VvE app in the Netherlands, as well as Excel for financial calculations, are already in use, there are other tools and potential developments that could further aid this process:

Existing Tools:

- Energy Auditing Software: Tools for conducting detailed energy audits, providing insights into energy consumption, and identifying potential areas for improvement (e.g. RETScreen, EPB and EPC software).
- Project Management Platforms: Software designed to manage renovation projects, track progress, allocate resources, and facilitate communication among stakeholders (e.g. Buildertrend, Procore).
- Financial Planning and Analysis Tools: Advanced financial modeling software beyond Excel, offering more nuanced analyses and projections for renovation costs, savings, and return on investment (e.g. PlanGuru, QuickBooks).
- Building Information Modeling (BIM) Software: BIM tools for planning and visualizing renovations, understanding impacts on building performance, and facilitating collaborative design and decision-making (e.g. Autodesk Revit, ArchiCAD).
- Sustainability Assessment Tools: Software to evaluate the environmental impact of renovation projects, including carbon footprint, energy efficiency, and sustainability rating systems (e.g. EPC, EnerPHit), TOTEM.

- Subsidy and Incentive Finders: Online platforms that help homeowners and HOAs identify available government grants, subsidies, and incentives for energy renovations (e.g. Energy saving trust).
- Collaborative Decision-Making Platforms: Tools that facilitate collective decision-making within HOAs, such as voting systems or platforms for gathering and analyzing member opinions and preferences (e.g. Loomio, Condo Control).

Potential Tool Developments:

- Integrated Renovation Platforms: Comprehensive online platforms that combine energy auditing, financial planning, project management, and stakeholder collaboration in one seamless interface.
- AI-Powered Energy Efficiency Predictors: Utilizing artificial intelligence to predict the potential energy savings and cost benefits of different renovation scenarios.
- Blockchain for Transparent Funding and Incentives: Implementing blockchain technology to manage and track the distribution of funds, subsidies, and incentives transparently and securely.
- Virtual Reality (VR) for Renovation Visualization: Using VR technology to help homeowners and HOA members visualize renovation outcomes before they are implemented.
- Customizable Financial Analysis Dashboards: User-friendly dashboards that allow HOAs to input data and receive tailored financial analyses for their specific renovation projects.
- Regulatory Compliance Trackers: Tools to help HOAs stay informed about and comply with local, national, and EU regulations related to building renovations and energy efficiency.
- Community Engagement and Education Platforms: Online resources and forums for educating HOA members about the benefits of energy renovations and fostering a community around sustainability practices.

While several tools are available to support the execution and management of energy renovations for HOAs, there is room for further development, especially in integrating these functionalities into comprehensive, user-friendly platforms. Emerging technologies like AI, VR, and blockchain offer exciting possibilities for enhancing these tools, making the renovation process more efficient, transparent, and engaging for all stakeholders involved.

4.Barriers and opportunities for the further development of IHRS for condominiums

In exploring the barriers and opportunities for the further development of IHRS for HOAs, a comprehensive analysis was conducted, drawing insights from both European projects and collaborative workshops. The first subsection explores the lessons learned from European initiatives. The second subsection focuses on lessons derived from workshops organized by the CondoReno partners to enhance their BMs. These collaborative sessions provided a platform for stakeholders to share experiences, strategies, and innovative approaches, contributing to a nuanced understanding of the diverse factors influencing the integration of home renovation services for condominiums.

4.1. Lessons from previous and on-going European projects

Various European projects such as Save the Homes, Padova Fit Expanded, I-Heros, ProRetro, ACE-Retrofitting, Green Home, and Annex 75 have provided invaluable insights into overcoming barriers to energy renovations for homeowners. To assist partners and stakeholders in enhancing their BMs, the following table synthesizes these barriers and proposes targeted opportunities for improvement. By learning from these diverse projects, stakeholders can identify potential enhancements in their approaches, ensuring more efficient, sustainable, and customer-centric energy renovation services. The table aims to bridge the gap between current barriers and future opportunities, providing a strategic roadmap for enhancing BMs in the energy renovation industry.

Table III: Lessons learned from EU Projects

Barrier	Opportunity for Improvement	Derived From	Description	Related BM Building Block
Financial barriers in renovations	Affordable Financing Models	Save the Homes, Green Home	Develop financing options that are accessible and affordable for homeowners.	Value proposition
Legal and regulatory challenges for CMs and HOAs	Simplified Legal Processes	PadovaFIT, I-Heros, ACE-Retrofitting	Streamline legal and regulatory processes to facilitate easier participation in renovation projects.	Key Activities
Lack of initial homeowner engagement	Free Initial Consultation Services	ProRetro, Save the Homes, Annex 75	Provide free initial consultations to encourage homeowners to consider energy-efficient renovations.	Customer Relationships
Transparency and trust issues	Enhanced Communication Strategies	All Projects	Implement clear and transparent communication channels for all stakeholders.	Customer Relationships
Difficulty in decision-making for renovations	Decision Support Tools	I-Heros, ACE-Retrofitting	Develop tools and services that aid homeowners and HOAs in making informed decisions.	Value Propositions Key Resources
Inadequate information on energy efficiency	Educational and Information Programs	PadovaFIT, ProRetro, Green Home	Offer comprehensive information and educational programs about energy efficiency and renovation benefits.	Channels Key Activities
Fragmented renovation market	Integrated Service Offerings	Save the Homes, ProRetro	Create integrated services that cover all aspects of the renovation process, making it easier for homeowners.	Value Propositions
Resistance to innovative contract solutions	Community Engagement and Trust Building	PadovaFIT, ACE-Retrofitting	Engage with community members to build trust and understanding of innovative solutions.	Customer Relationships
Need for targeted marketing	Tailored Marketing and Outreach	ProRetro, Annex 75	Implement marketing strategies that are specifically tailored to different homeowner segments.	Channels
Recruitment challenges for advisors	Training and Development Programs	I-Heros, Annex 75	Develop comprehensive training programs for advisors to enhance their skills and effectiveness.	Key Resources Key Activities
Legal questions about liability	Legal Support and Risk Management	ProRetro, ACE-Retrofitting	Provide expert legal support to address liability and risk concerns in renovation projects.	Key Partnerships
Challenges in collaboration with stakeholders	Effective Partnership Models	Green Home, ProRetro	Develop models for effective and transparent partnerships with various stakeholders involved in renovation projects.	Key Partnerships

These insights emphasize the importance of addressing financial, legal, informational, and operational challenges while prioritizing customer engagement, transparency, and collaboration. By implementing these improvements, stakeholders can not only enhance the efficiency and effectiveness of their services but also foster a more conducive environment for energy-efficient renovations. Ultimately, this leads to a more sustainable and resilient housing sector, aligning with broader environmental goals and community needs. As the industry evolves, continuous learning and adaptation, as exemplified by these projects, will be crucial in overcoming emerging challenges and seizing new opportunities.

4.2 Lessons from workshops (to improve the business models)

A series of workshops have been organized by CondoReno project partners in collaboration with other entities and stakeholders involved in the renovation process for condominiums. The following sections present the lessons learned from those workshops.

Table IV: Overview of the workshops organized by CondoReno Partners

Workshop title	Code	Date	location	Number of participants
Mini-atelier I – Masterplan light	W-1-1	June 2023	Antwerp	11
Mini-atelier II – Spatial valorisation potential	W-1-2	June 2022	Antwerp	12
Energetic renovation condominiums	W-2-1	April 2022	Mechelen	14
Renovation master planning and funding sources	W-2-2	June 2022	Mechelen	11
Barriers to energy renovation of condominiums	W-3	n.a	Ostend	n.a
Barriers and opportunities	W-4	March 2023	Tiel	11
Accelerating deep renovations for condominiums	W-5	November 2023	The Hague	20

Thematic Mini-Ateliers by the city of Antwerp

The thematic mini-ateliers organized by the city of Antwerp, in collaboration with REBEL and AWB Architecture Workroom Brussels, as part of the CondoReno project, provided a platform to explore and refine strategies for accelerating collective energy renovations in apartment buildings. These sessions, driven by insights from a theme day held in November 2022, focused on developing a robust understanding of various BMs and identifying opportunities for improvement. The discussions centered around solidifying business cases, understanding the motivation for collective approaches, and devising financial solutions for residents. This summary aims to encapsulate the essence of these workshops and link their findings to specific BM building blocks, enhancing the viability and efficacy of the proposed solutions.

Strategies for Accelerating Collective Energy Renovations in Apartment Buildings: Business, Motivation, and Financial Solutions:

A. Solid Business Case and Guidance Capacity:

Barrier: Insufficient compensation for design agencies and intensive time investment for the city.

Opportunity: Increase study phase remuneration, involve private sector support, and revalue the syndic's profession.

B. Motive for Collective Approach:

Barrier: Slow private home renovations and collective renovation challenges.

Opportunity: Financial incentives for collective renovations, renovation obligations for HOAs, accessible information, and optimized HOA organizational structures.

C. Financial Solutions for All Residents:

Barrier: High costs of energetic renovations and complexity of financial support.

Opportunity: Simplifying financial aids, interest-free loans, and a collective financial burden distribution.

The overall focus is on addressing financial, organizational, and motivational challenges to accelerate energy renovations in apartment buildings through a collective approach, involving various stakeholders and innovative financing mechanisms.

Conclusions and insights:
Focus Shift: Encourage self-reliance among homeowners and provide individual support within apartment buildings.

Role of the City: Maintain the city's role in project acquisition and advisory services while adapting to market changes.

Premiums and Loans: Ensure long-term clarity for financial aids.

Feedback: The government's impartial role is crucial, and dual contact points (HOAs/Syndics and engineering firms) are effective.

Points of Attention: More workforce for implementation, incentivization for master plan studies, and attention to behavioral changes.

Antwerp Process Feedback: Simplify decision-making, understand CA's objectives, and investigate payment preferences.

Follow-up Studies: Clarify subsequent steps post-master plan study and explore possibilities for building expansion.

Spatial Valorization Potential: Address financing issues, create guidelines for building expansions, and consider cross-domain strategic policies.

The conclusion of this session is as follows:

The workshops conducted by the city of Antwerp have highlighted the complexities and potential solutions in driving energy renovations in apartment buildings. The discussions pointed towards the need for a balanced approach, considering financial, organizational, and motivational factors.

Key takeaways include the importance of financial clarity, the need for solid business cases, and the role of the city in facilitating and guiding these processes. By aligning these insights with specific business model building blocks, stakeholders can better understand and address the multifaceted challenges in energy renovations, ultimately leading to more sustainable and efficient housing solutions.

Space for energy along the Mechelse Vesten by the city of Mechelen

The city of Mechelen, through its initiatives 'Space for energy along the Mechelse Vesten' and the EU-City Facility project, embarked on a journey to explore and support the collective energy renovation of apartment buildings, particularly within HOAs. A series of focus groups with local stakeholders, including project team members, co-owners, CMs, and architectural firm representatives, provided critical insights into the barriers and potential solutions for energy renovations. These discussions centered around experiences with energy renovations, thresholds in the renovation process, support mechanisms, renovation master planning, financing, and the role of ESCOs. This summary aims to extract the essence of these focus groups, linking their findings to relevant BM building blocks, and thereby enhancing the understanding of the viability of these business models in the context of energy renovations.

Summary of Focus Groups and Link to Business Model Building Blocks

1. Experiences with Energy Renovations:

Barriers: Technical challenges in older buildings, legal permissions, and coordination difficulties.

Solutions: Innovative technical solutions, and streamlined legal processes.

2. Thresholds in Energy Renovation:

Barriers: Split incentives, complexity, ownership structures, and financial capabilities.

Solutions: Clearer incentive structures, simplification of processes, and financial support mechanisms.

3. Support for Energy Renovation:

Needs: Financial support (grants, loans), assistance with premium applications.

Solutions: Enhanced access to funding, clear overview of grants, and eligibility criteria guidance.

4. Role of the City of Mechelen:

Suggestions: Facilitate low-cost loans, incentives for master plan studies, and focus on insulation.

5. Renovation Master Planning:

Challenges: High costs, absence of plans, reluctance in hiring study firms.

Solutions: Subsidized master plan studies, comprehensive renovation approach.

6. Financing Energy Renovation:

Barriers: Owner reluctance, unfamiliarity with financing options, legal barriers.

Solutions: Diverse financing sources, subsidies, grants, and tailored loans.

7. Support from Mechelen:

Suggestions: Lobbying for grant pre-financing, and integration with reserve funds.

8. Role of ESCOs:

Observations: Suitability for specific investments, challenges in facade/window renovations.

Solutions: Exploring ESCO models for viable investments, and adapting models to renovation needs.

The focus groups conducted by the city of Mechelen have shed light on the multifaceted nature of energy renovations in apartment buildings, particularly within the framework of HOAs. The discussions highlighted various barriers, from technical challenges and complex ownership structures to financial constraints and unfamiliarity with available support mechanisms. The proposed solutions, such as subsidized master planning, diverse financing options, and the potential role of ESCOs, point towards a holistic approach to energy renovation. By aligning these insights with specific BM building blocks, stakeholders can gain a deeper understanding of how to effectively address these challenges. This approach not only facilitates more efficient and sustainable energy renovations but also fosters a more supportive and collaborative environment for all parties involved in these initiatives.

Workshop by the city of Ostend

In Ostend, a city where over 60% of residential buildings are aging apartment buildings, there's a significant push to make all residential structures energy-efficient by 2050. This initiative, particularly focused on multi-family houses, emphasizes the need for thorough renovations that address both structural integrity and energy efficiency. The CondoReno project, integrating services from Energiehuis Oostende and Flanders into an IHRS, plays a pivotal role in guiding HOAs through this transformative process. The workshop conducted in Ostend looked into the challenges, objectives, and strategic considerations necessary for developing an effective IHRS. This summary aims to encapsulate the key points from the workshop and link them to relevant BM building blocks, enhancing the understanding of the viability and efficacy of these approaches in the context of energy renovations.

The development of IHRS in the City of Ostend involves several key considerations:

1. Challenges and Objectives in Establishing IHRS:

Barriers: Internal SWOT and risk analyses reveal technical, financial, and social challenges.
Solutions: Advisory and supportive services to empower HOAs in decision-making.

2. Importance of Renovation Master Plan:

Need Comprehensive planning for prioritizing investments and avoiding lock-ins.
Solution: Autonomy for HOAs with accurate, comprehensive information and plans.

3. Barriers to Integrated Counselling Programs:

Challenges: Resistance due to fears, lack of expertise, and sociodemographic diversity.
Solution: Tailored communication strategies and inclusive counseling programs.

4. Thorough Renovation Planning:

Requirement: Effective translation of master plan into implementation, preventing lock-ins.
Solution: Involving HOAs in the planning and execution process.

5. Future-Proof Heating Systems:

Consideration: Renewable and sustainable heating solutions in line with climate goals.
Solution: Adoption of heat networks or fossil-free heating sources.

6. Overheating Risk and Shading Solutions:

Challenge: Overheating due to transparent surfaces in apartments.
Solution: Implementation of physical shading or sunscreen alternatives.

7. Financing Challenges:

Barrier: High renovation costs and potential exclusion of low-income individuals.
Solution: Exploration of alternative financing sources and long-term planning.

8. Loan Considerations:

Need Protection for both HOAs and lenders against defaults.
Solution: Effective communication with credit insurers and thorough insurance checks.

The workshop in Ostend highlighted the complexities and strategic considerations in pursuing energy renovations in apartment buildings, particularly in the context of aging structures and diverse homeowner demographics. The establishment of an IHRS presents a multifaceted approach, addressing technical, financial, and social aspects, and ensuring that renovations are not only structurally sound but also energy efficient. The discussions emphasized the need for comprehensive planning, inclusive counseling, sustainable solutions, and financial foresight. By aligning these insights with specific business model building blocks, stakeholders can gain a more nuanced understanding of how to navigate these challenges effectively. This approach fosters a more sustainable, inclusive, and efficient pathway towards achieving Ostend's ambitious energy efficiency goals by 2050, setting a precedent for similar urban renewal efforts.

Barriers and opportunities Workshop in Tiel

A workshop took place in Tiel, organized collaboratively by TU Delft and KERN Institute. The primary objective of the workshop was to delve into the barriers hindering energy renovations for HOAs and to collaboratively devise viable solutions. Attended by 12 participants, the workshop participants were divided into two groups, each tasked with addressing social, technical, legal, and financial barriers associated with energy renovations. Drawing insights from literature, EU projects, and experiences gleaned from the CondoReno project, the workshop aimed to map out these barriers comprehensively. Throughout the session, participants engaged in dynamic discussions, proposing solutions to overcome identified barriers within their respective categories. The interactive nature of the workshop allowed each group to reflect on and refine the solutions put forth by the other, fostering a collaborative and multidimensional approach to problem-solving. Notably, the workshop also brought to light new barriers, enriching the findings and contributing to a more nuanced understanding of the challenges faced in the realm of energy renovations for Homeowners associations. This targeted approach aimed to not only pinpoint barriers but also to proactively strategize on how BMs could play a pivotal role in mitigating the challenges faced by HOAs in the realm of energy renovations.

Outcomes of the workshop:

1. Addressing Technical Barriers:

Challenges: Lack of quality assurance, absence of standardized solutions, skilled worker shortage.
Solutions: Integration of training for CMs and workers, quality certification process.

2. Addressing Social Barriers:

Challenges: Prolonged decision-making, lack of awareness, insufficient stakeholder dialogue, and behavioural barriers.
Solutions: Robust communication strategies, role distribution, and segmentation approach for co-owners.

3. Addressing Financial Barriers:

Challenges: High upfront costs, long payback period, funding difficulties, split incentives.
Solutions: Public-private financial instruments, collective upfront funds, stimulating the financial market, and extra subsidies for smaller HOAs.

4. Addressing Legal Barriers:

Challenges: Insufficient regulations, complex ownership structures, and policy challenges.
Solutions: Enhanced building codes, future-proof regulations, new policies for financial incentives, mandates for CMs, and calamity fund creation.

The workshop in Tiel underscored the multifaceted nature of challenges in energy renovations for HOAs and proposed a variety of innovative solutions. Technical barriers require a focus on quality assurance and skill development, social barriers call for improved communication and stakeholder engagement, financial barriers highlight the need for creative funding solutions, and legal barriers demand regulatory enhancements and policy support. By aligning these solutions with specific business model building blocks, stakeholders can gain a comprehensive understanding of effective strategies to navigate these challenges. This collaborative approach not only facilitates more sustainable and efficient energy renovations but also fosters an environment conducive to proactive problem-solving and innovation in the realm of HOA energy renovation projects.

Accelerating deep renovations for condominiums Workshop in the Hague

TU Delft and VCB have organized a workshop with the collaboration of the municipality of the Hague titled 'Acceleration workshop: Integral renovations for more Condominiums' The aim of the workshop was to discuss the need for new policy developments in the Netherlands, potential BMs for public or private operation, and explore new collaboration possibilities in order to secure HOAs decisions to invest in renovations. The workshop also emphasized the importance of success in the initial stages of the renovation process, as subsequent phases rely on the collaboration of various stakeholders. The workshop aimed to identify gaps, discuss stakeholder roles and provide recommendations for future endeavors.

Outcomes of the workshop:

1. Importance of Stakeholder Collaboration:

Observation: Collaboration among diverse stakeholders is crucial for crafting effective BMs.
Solution: Develop a collaborative model involving all key stakeholders.

2. Success in Initial Renovation Stages:

Challenge: Ensuring success in early stages to facilitate collaboration in subsequent phases.
Solution: Focusing on strategic planning and stakeholder engagement from the outset.

3. Securing HOA Investment Decisions:

Goal: Guiding HOAs through the customer journey to ensure investment in renovations.
Solution: Providing comprehensive support and clear information to HOAs.

4. Identification of Gaps and Stakeholder Roles:

Exercise Outcome: Understanding the role and influence of each stakeholder in the renovation process.
Solution: Tailoring roles and responsibilities to ensure effective stakeholder contribution.

5. Streamlining Renovation Phases:

Challenge: Ensuring smooth transition and coordination between different phases of renovation.
Solution: Develop a seamless process for managing the renovation journey.

6. Exploration of One-Stop Shop (OSS) Model:

Vision: Developing an OSS model specifically tailored for HOAs.
Solution: Integrating services and support into a single platform for ease of access and efficiency.

The Workshop provided insightful discussions on the necessity of stakeholder collaboration, strategic planning in initial renovation stages, and the development of effective BMs to support HOAs. The workshop's outcomes emphasize the significance of understanding stakeholder roles, identifying gaps, and exploring new collaboration models such as an OSS tailored for HOAs. By aligning these insights with specific BM building blocks, stakeholders can develop a more structured and collaborative approach to condominium renovations. This approach not only streamlines the renovation process but also ensures that HOAs are adequately supported and informed.

The following table provides a comprehensive overview, aligning each barrier with an opportunity for improvement, the corresponding workshop, a brief description, and the related BM building block. This should help in understanding how the insights from these workshops can be applied to develop and refine business models for energy renovations in condominiums.

Table V: Lessons learned from workshops

Barrier	Opportunity for Improvement	Code	Description	Related BM Building Block
Insufficient compensation for design agencies	Increase study phase remuneration	W-1 W-1-1	Financial challenges in compensating design agencies	Key Partnerships
Intensive time investment for the city	Involve private sector support	W-1 W1-1	Time and resource challenges for city involvement	Key Partnerships
Slow private home renovations	Financial incentives for collective renovations	W-1 W-1-1	Need to speed up individual renovations	Customer Relationships
Collective renovation challenges	Renovation obligations for HOAs	W-1 W-1-1	Difficulties in managing collective renovations	Key Partnerships
High costs of energy renovations	Simplifying financial aids	W-1 W-1-1	Financial barriers for residents	Value proposition
Technical challenges in older buildings	Innovative technical solutions	W-2 W2-2	Technical barriers in the renovation of older structures	Value proposition Key Activities
Legal permissions and coordination difficulties	Streamlined legal processes	W-2 W-2-2	Legal and organizational barriers in renovations	Key Resources Partnerships
Split incentives and complex ownership structures	Clearer incentive structures	W-2 W-2-2	Conflicts of interest and complexity in decision-making	Key Partnerships
Lack of financial support mechanisms	Enhanced access to funding	W-2 W-2-2	Need for financial assistance for renovations	Key Activities
Technical, financial, and social challenges in IHRS	Advisory and supportive services	W-3	Multifaceted challenges in implementing IHRS	Key Activities Key Partnerships

Table V: Lessons learned from workshops (Continued)

Barrier	Opportunity for Improvement	Code	Description	Related BM Building Block
Need for comprehensive renovation planning	Autonomy for HOAs with comprehensive info	W-3	Importance of detailed planning for HOAs	Value Propositions
Resistance to integrated counseling programs	Tailored communication strategies	W-3	Challenges in adopting counseling programs	Customer Relationships
High renovation costs	Alternative financing sources	W-3	The financial burden of renovations	Value Proposition
Lack of quality assurance	Integration of training for CMs and workers	W-4	Need to ensure renovation quality	Value Proposition
Prolonged decision-making and lack of awareness	Robust communication strategies	W-4	Social barriers in decision-making processes	Customer Relationships
High upfront costs and funding difficulties	Public-private financial instruments	W-4	Financial challenges in initial investment	Key Partnerships
Insufficient regulations and complex structures	Enhanced building codes and policies	W-4	Legal and structural barriers in renovations	Key Activities
Need for stakeholder collaboration	Developing a collaborative model	W-5	Importance of cooperation among stakeholders	Key Partnerships
Ensuring success in the early stages	Focusing on strategic planning	W-5	Criticality of initial phase success	Key Activities
Guiding HOAs in investment decisions	Providing comprehensive support	W-5	Need for supporting HOAs throughout the process	Customer Relationships Key Activities
Identifying gaps and stakeholder roles	Tailoring roles and responsibilities	W-5	Understanding and assigning roles effectively	Key Partnerships Key Activities
Ensuring smooth transition between phases	Developing a seamless process	W-5	Managing coordination across renovation phases	Key Activities Key Resources
Developing a one-stop shop (OSS) model	Integrating services into a single platform	W-5	Need for a centralized support system	Channels Key Resources

A comprehensive study titled 'Barriers and Solutions for Homeowner Associations to Undertake Deep Energy Renovations of Condominiums' will be presented at the European Council for an Energy Efficiency Economy (eceee) Conference in June 2024 as part of this on-going research. This comprehensive research investigates the challenges faced by HOAs when attempting deep energy renovations in condominium settings. It not only identifies the key barriers hindering progress but also proposes innovative and viable solutions to overcome these challenges. The study, characterized by its depth and practical applicability, promises to offer valuable insights and strategic directions for HOAs aiming to enhance energy efficiency and sustainability in their properties. Its findings are expected to play a crucial role in shaping future policies and practices in the field of energy renovations, particularly for HOAs.

4.3 Recommendations for Developing a Viable Business Model of an IHRS Targeting HOAs

Based on the insights gathered from the workshops conducted, here are key recommendations for developing a viable BM for an IHRS targeting HOAs:

1. Emphasize Stakeholder Collaboration:

Collaborate with Various Stakeholders: Engage insurance companies, knowledge institutes, consultants, municipalities, and homeowner support organizations.

Facilitate Joint Ventures: Promote partnerships among public and private entities to leverage diverse expertise and resources.

BM Building block: Key Partnerships, Key Activities

2. Focus on Early-Stage Success:

Strategic Initial Planning: Ensure detailed planning and stakeholder engagement from the beginning of the renovation process.

Customer Journey Guidance: Provide clear, step-by-step guidance to HOAs through the initial stages of the renovation process.

BM Building block: Value Proposition, Key Activities

3. Enhance Communication and Decision Support:

Develop Robust Communication Strategies: Tailor communication to the diverse needs and backgrounds of HOA members.

Implement Decision Support Tools: Use tools that aid in simplifying complex decision-making processes for HOAs.

BM Building block: Customer relationship, Key Resources, Cost Structure

4. Address Technical Challenges:

Quality Assurance and Standardization: Integrate quality certification processes and standardized solutions into the business model.

Skilled Workforce Development: Offer training and development programs for construction workers and CMs.

BM Building block: Value Proposition, Key Activities

5. Overcome Financial Barriers:

Diverse Financing Options: Explore a combination of public and private financial instruments, subsidies, and attractive loans.

Customized Financial Solutions: Tailor financial solutions to different sizes of HOAs, focusing on the needs of smaller associations.

BM Building block: Key Activities

6. Legal and Regulatory Facilitation:
Advocate for Supportive Regulations: Work towards enhancing building codes and regulations that support deep renovations.
Streamline Legal Processes: Simplify ownership structures and legal procedures to facilitate renovation decisions.
BM Building block: Value Proposition, Key Activities

7. Implement an Integrated Service Approach:
Develop a One-Stop-Shop Model: Consolidate all renovation services, from planning to execution, under one platform.
Offer Comprehensive Service Packages: Include assessment, planning, financing, implementation, and post-renovation support.
BM Building block: Value Proposition, Key Activities

8. Foster Future-Proofing and Sustainability:
Incorporate Sustainable Solutions: Focus on energy-efficient, renewable, and sustainable renovation practices.
Anticipate Technological Advancements: Stay abreast of and integrate emerging technologies and practices in building renovations.
BM Building block: Value Proposition

9. Create a Scalable and Flexible Model:
Adaptability: Ensure the business model is adaptable to different scales of HOA projects and varying local contexts.
Continuous Learning and Improvement: Incorporate feedback mechanisms to continually refine and improve services.
BM Building block: Value Proposition, Customer segments, Key Partnerships

10. Engage in Community and Resident Education:
Educational Initiatives: Conduct workshops, seminars, and information sessions for HOA members to enhance awareness.
Promote Benefits: Highlight the long-term benefits of energy renovations in terms of cost savings, comfort, and property value.
BM Building block: Channels, Key Activities

By following these recommendations, IHRS providers can develop a BM that effectively meets the diverse needs of HOAs, ensuring successful, sustainable, and efficient home renovation projects. This approach will not only enhance the viability of the IHRS but also contribute significantly to the broader goals of sustainable urban development and energy efficiency.

5.Discussion: Further development of IHRS for condominiums in the Netherlands and Flanders

5.1 Recommendations for Enhancing the business models of Cities Antwerp, Mechelen, and Ostend

The cities of Antwerp, Mechelen, and Ostend have each developed unique BMs. These models, however, face distinct challenges and opportunities for improvement. Drawing from a series of insightful workshops, this section aims to provide tailored recommendations for each city, focusing on specific building blocks of their respective BMs. These recommendations are designed to optimize and strengthen their approaches to energy renovation projects, taking into account the varied needs of their HOAs, the evolving landscape of sustainable urban development, and the complexities inherent in large-scale renovation initiatives.

Table VI: Recommendations for enhancing the BMs of cities Antwerp, Mechelen and Ostend

Building block	Antwerp	Mechelen	Ostend
Customer Segments	Target smaller apartment buildings.	Target more condominiums and smaller HOAs.	Focus on HOAs
Value Propositions	Enhance masterplan with digital tools; and personalized services for HOA sizes.	Innovative, sustainable solutions; custom plans for condominium sizes.	Comprehensive, sustainable solutions; highlight long-term benefits.
Channels	Digital platforms for service delivery; webinars and workshops for engagement.	Enhance online presence; organize community meetings.	Digital platforms for information; engage property managers and services.
Customer Relationships	Build trust with pilot projects; implement feedback mechanisms.	Transparent communication; personalized consulting for HOA members.	Strong support for property managers; consistent communication.
Revenue Streams	Explore performance-based fees; offer premium services.	Fee-for-service models; public-private partnerships for funding.	Service fees for consultation; partner with ESCOs.
Key Activities	Intensify financial coaching; technical assistance in masterplan studies.	Policy advocacy; strengthen referral processes.	Develop long-term, adaptable renovation plans.
Key Resources	Staff training; develop a network of renovation experts.	Investment in CRM systems; trusted contractor pool.	Utilize Energiehuis Oostende expertise; strong partner network.
Key Partnerships	Collaborate with private sector and technology providers.	Expand partnerships with financial institutions and sustainability experts.	Collaborate with local construction firms and energy companies.
Cost Structure	Optimize costs using technology; explore cost-sharing models.	Streamline operations; and cost-effective marketing strategies.	Optimize organization to reduce costs; invest in staff training.

By addressing each building block systematically, these cities can enhance their strategies to better cater to the needs of their communities, leverage emerging opportunities, and overcome prevailing challenges. The proposed changes are expected to lead to more efficient, sustainable, and resident-focused renovation processes. In embracing these recommendations, Antwerp, Mechelen, and Ostend can set pioneering examples in sustainable urban development, demonstrating how cities can effectively adapt and innovate in response to the unique demands of energy-efficient building renovations.

5.2 Recommendations for Enhancing Market driven Business models: The case of WNR

The BM employed by WNR demonstrates significant potential in providing a comprehensive service tailored to the needs of HOAs. This model encompasses a wide range of aspects essential for facilitating effective and efficient energy renovations in condominiums. However, despite its robust framework, there are opportunities for enhancement that can further elevate its viability. By addressing certain areas for improvement, the WNR BM can be fine-tuned to ensure a more holistic approach, accounting for all critical aspects necessary for successful implementation. The following table presents targeted recommendations for each BM building block, aimed at optimizing WNR's strategy and operations to better serve HOAs in their journey.

Table VII: Recommendations for enhancing the BM of WNR

Building block	WNR
Customer Segments	Target smaller apartment buildings (neighborhood approach-townhouse approach)
Value Propositions	Utilizing futureproof renovations next to living cost neutral concept. That can lead to renovation guarantees that could be provided as a needed value for homeowners
Channels	Digital platforms for service delivery
Customer Relationships	Build trust with pilot projects; implement feedback mechanisms.
Revenue Streams	Offer premium services. Subscription fees for digital tools used by HOAs and CMs. Explore Revenues from investments like topping up or the increase of the total square meter of the building after renovation
Key Activities	Technical assistance in masterplan studies. Focusing on communication with early adopters or co-owners that have the potential to convince the rest of the HOA
Key Resources	Staff training; develop a network of renovation experts. Digital tools and more human resources
Key Partnerships	Collaborate with private and public sectors including energy advisors and CMs
Cost Structure	Optimize costs using technology; explore cost-sharing models

5.3 Outlook towards the evaluation of business models

Looking forward, the evaluation of BMs in the future and throughout the duration of Work Package 6 (WP6) of the LIFE-project CondoReno holds significant promise in advancing the IHRS beyond their current operations. As this work package focuses on the development of a methodology to evaluate the development of IHRS for condominiums, the evaluation of BMs becomes a crucial aspect in determining the sustainability and scalability of these models. Through examination and analysis, CondoReno partners will identify a joint evaluation method to explore the innovation pathways and self-sustenance opportunities of IHRS models for targeting condominiums. The outlook anticipates a comprehensive understanding of the innovation pathways, self-sustenance opportunities, and market recognition of IHRS models in Antwerp, Mechelen, Oostende, and the Netherlands. The evaluation process, encompassing participatory observation, interviews, and questionnaires, is designed to extract valuable insights into the success factors related to strategic niche management, local policy development, and stakeholder activation. As this evaluation unfolds, the project aims to not only contribute to the development of exemplary IHRS for condominiums but also to provide concrete data and guidance on successful BMs, process management, and collaboration structures.

To the extent that the BMs of the partners are elaborated, and the role of the public sector has been defined, CondoReno will also be able to involve the actors from the construction sector in a further phase of the project. CondoReno will carry out the evaluation and work with construction companies. In doing so, we are looking for models in which the private sector can fill in part of the actions taken up by the public sector. This will be an important action point of Embuild (CondoReno partner) in the next months of the project: highlight the results of the partners and activate and enthuse the cooperation of the supply side.

The International Union of Property Owners (UIPI-CondoReno partner) will evaluate these BMs with key representatives from the UIPI sector (through a workshop – for UIPI members and key European stakeholders from the real estate sector) in order to identify to what extent the BMs can be used in the promotion of IHRS in the targeted regions and eventually more widely in Europe. Input will be collected through a short questionnaire that will help us to identify the added value and the possible segment of the models to replicate or adapt.

6.Conclusion

This report aimed to answer the question How can the business models of current IHRS accelerate highly energy-efficient renovations by HOAs? Firstly, it was important to understand BM components of current IHRS targeting HOAs. This was done by extensive exploration of IHRS providers facilitating energy renovations for HOAs in Europe, with a focus on the Netherlands and Flanders, that provided valuable insights. The initial emphasis on the integral approach of IHRS for HOAs set the stage for a comprehensive analysis of BMs, including those developed by the CondoReno project partners and other public, public-private, and private service providers. The examination of various BMs underscored both similarities and differences among service providers. Public entities, often acting as trusted intermediaries, initially offer some services for free but face challenges in transitioning away from dependence on public funds. Private models, on the other hand, grapple with the need for substantial investment in data tools and additional activities to establish trust with HOAs, leading to increased operational costs.

Secondly, insights were derived from European projects to enhance the constituent elements of the BM for IHRS providers by exploring lessons learned from several projects to come out with a list of recommendations and opportunities to improve the BM building block to alleviate known barriers. Barriers and opportunities for further development of IHRS for condominiums were elucidated through lessons learned from both previous and ongoing European projects, as well as insights gained from CondoReno workshops. It became evident that stakeholder collaboration, a holistic approach, effective communication and awareness strategies, tailored strategies, long-term planning, and financial support are crucial elements for the success of IHRS providers' BMs.

Lastly, some factors can be identified contributing to the viability of BM of IHRS providers such as: Market demand and customer needs, financial models and funding sources, regulatory environment and incentives, technology and innovation, partnership and collaborations, scalability and flexibility, customer engagement and education, quality assurance and standards compliance, sustainability and environmental impact, and risk management

Notably, throughout the extensive examination of IHRS providers' BMs, a recurring observation emerged regarding the effectiveness of collaborations between public and private entities. Initiatives such as climate agencies or OSSs, often spearheaded by municipalities, have demonstrated a notable synergy by combining the strengths of both sectors. These collaborations leverage the availability of public data, support, and trust inherent in municipal initiatives with the private sector's expertise, focused approach, and additional support. The success of such hybrid models points towards a promising direction for the future development of IHRS providers, emphasizing the potential benefits of a harmonious partnership between public and private stakeholders.

As IHRS providers navigate the complex landscape of energy renovations for HOAs, these findings provide a roadmap for overcoming challenges and optimizing opportunities. The path to sustainable IHRS BMs involves a delicate balance between public and private sector engagement,

data-driven decision-making, and a strategic focus on stakeholder collaboration. Implementing these lessons learned will be essential for IHRS providers to achieve sustained success and contribute significantly to the energy efficiency goals.

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