Proof of concept based on 8 pilot

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House Style

	Red RGB	Green RGB	Blue RGB	HEX
Logo				
Green	42	205	87	#2acd57
Orange	255	132	71	#ff8447
Grey	79	76	76	#4f4c4c
 THE USE OF THE EU EMBLEM IN THE CONTEXT OF EU PROGRAMMES 2021-2027 LINK				
EU corporate blue	0	51	153	#003399
Yellow	255	204	0	#FFCC00

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Terminology list

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)

Condominium associations: The legal entity that brings together all co-owners of a condominium. The CA is represented by a General Assembly. It is responsible for the daily management, the maintenance and renovation of a building owned in co-ownership.

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

Demand side: This term refers to the individuals or entities within condominium associations 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 within condominium associations, as well as the managerial aspects of overseeing such projects.

Integral approach for renovation: Renovation that considers individual preferences and societal perspectives, offered by professionals or teams that streamline the renovation process.

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

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.

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 level, using distinct types of policy instruments.

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 condominium associations. (Brown et al., 2018; Franklin, 2020; Estay et al., 2021; Milin & Bullier, 2021)

List of abbreviations

Abbreviation	Meaning
ANTW	The city of Antwerp
APC	Paris Climate agency
BMC	Business model canvas
BM	Business model
CA	Condominium association
CM	Condominium manager
CondoReno	Acronym of the project "Creating and Multiplying Integrated Home Renovation Services for private condominiums in the Netherlands and Flanders" (LIFE grant agreement No. 101076316)
ESCO	Energy service company
FAB	Flemish Advisory Board
KPI	Key Performance Indicator
MECH	The city of Mechelen
NAB	National Advisory Board
IHRS	Integrated home renovation services
OSS	One stop-shop
OOST	The city of Ostend
RvME	Raad van mede-eigendom
SVVE	Subsidieregeling verduurzaming voor verenigingen van eigenaars
TUD	Technical university of Delft
VEKA	The Flemish Energy and Climate Agency
WNR	WoonlastenNeutraal Renoveren
WP	Work package

Executive Summary

Work Package 4 of the CondoReno project aims to test and demonstrate the Integrated Home Renovation Services (IHRS) intervention in the decision-making processes of Condominium Associations (CAs) through various case studies. This initiative aims to structure knowledge for local authorities interested in promoting comprehensive renovation trajectories for apartment complexes. Based on previous developments, partners will assess viable business models (related to WP2) and use toolkits (related to WP3). The business models and toolkits will be tested in two pilots in the Netherlands and six pilots in Flanders, intervening in the decision-making processes of the CA to facilitate ambitious energy investment decisions based on the IHRS approach.

Currently, the first case studies have started and are going through the first phases of the renovation journey towards achieving Energy Label A. Ultimately, the eight highlighted case studies will be carefully selected with a perspective of scalability to other European cities and municipalities (related to WP5). These eight cases aim to demonstrate improvements in renovation rates, energy consumption, process optimisation and social inclusion, in line with the requirements for zero emission buildings as outlined in the new European Directive.

The financial, technical, legal and social aspects of each case will be analysed using the evaluation parameters (related to WP6) to assess the replicability in a larger number of European cities, taking into account the diversity of local contexts and typologies. Based on the conclusions drawn from the cases, WP4 will test, evaluate and adapt business models and tools in order to integrate them as seamlessly as possible into the IHRS service framework. The evaluation will include technical, legislative, financial and social perspectives, with the aim of optimising IHRS based on cross-country comparisons.

Short-term outcomes include the dissemination of practical reference documents to local stakeholder networks and emerging actors in IHRS and policy, and reports on the development and implementation of pilot projects. Long-term outcomes will focus on improved decision-making processes within local authorities, increased trust between local actors, and accelerated renovation through sustainable energy investments, primary energy savings, renewable energy generation and greenhouse gas emission reductions. Ultimately, the project aims to provide a comprehensive framework for scalable housing retrofits in different cities across Europe.

1. Introduction

1.1. The CondoReno project

CondoReno will lead to the development of IHRS for CAs 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.

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 strengths of market-driven IHRS in the Netherlands and local authority-driven IHRS in Flanders into adapted IHRS BMs. Four of the partners, three Flemish cities and one Dutch market player, will oversee these case studies, totalling 80 renovation case studies, and choose eight representative cases for further in depth research. Testing will be done by intervening directly in meetings of eight CAs.

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

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

1.2. Local context

An important aspect to consider in the CondoReno research project are the contextual differences between the Flemish and the Dutch partners. While all regions share linguistic and cultural similarities, there are significant differences in their legal frameworks, building regulations and renovation practices.

Also the partner cities in Belgium, namely Antwerp, Mechelen and Ostend, each face their own unique local challenges and barriers in the context of their apartment building renovation journey. On the other hand, the route that homeowners have to take is broadly similar in both countries.

For several years, Antwerp has been pursuing a trajectory that guides apartment buildings through ambitious renovation processes. As a result, the city of Antwerp has built up valuable expertise from these previous, and ongoing, projects. In addition, the Flemish authorities have been inspired by Antwerp's successful operation, leading to the initiation of the masterplan operation by the Flemish government. There is a strong link between these parties. The existing renovation trajectory in Antwerp and its available workforce for this, has influenced the setting of higher Key Performance Indicator (KPI) targets compared to the other partner cities. Antwerp is

also actively working to extend its heat network, an aspect that will be considered in future energy retrofits.

The city of Ostend serves as an exemplary case study for the coastal cities. Buildings in this region face significant challenges due to harsh winds and sea air. In addition, the prevalence of second homes and holiday homes presents unique considerations for renovation projects. Renewable energy is a top priority in Ostend, where the further development of the local heating grid is under investigation. Furthermore, the renovation strategy of the condominiums will be extensively elaborated in the development of a local heat plan.City of Mechelen worked with and for condominiums in two previous projects: the 'Mechelse Vesten Climate District'1 and the EU City Facility project2. With the Mechelse Vesten climate District, Labo Ruimte (Flemish government) and the city of Mechelen simultaneously investigated the feasibility of developing a heat network under the road which lays on top of the old city canals (Vesten). The project targeted also the collective renovation of apartment buildings along this city-wide infrastructure. During the EU City Facility project the City of Mechelen developed a high-level investment concept with which apartment buildings on the Mechelen territory can be renovated (at an accelerated pace) to an energy label A. The investment concept started with an inventory and categorisation of the condominiums in Mechelen. It explored an investment mix of private financing (funds of the co-owners), public means of financing (Flemish MijnVerbouwPremie) in combination with financing from an ESCO party. . The exploration showed that the high-level investment concept can only be economically viable when an integrated deep retrofit of condominiums is planned, and the condominium has large available own funds. We hope the case studies of the CondoReno project provide insights on the required financing mix that will make the investment concept viable and – in a later phase - disseminatable.

Taking the elaborated categorisation as a starting point, the City of Mechelen focused the last 18 months on building services for medium and large condominiums (buildings with 15 apartments or more). In the Malines area, it involves 374 condominiums with 6723 apartments. For this condominiums City of Mechelen developed an active, outreaching approach, consisting of direct contacts with condominium managers and boards of condominium association, in combination with a quarterly newsletter for this audiences. At this moment (March 2024) city of Mechelen supports 14 condominiums in a renovation masterplan trajectory.

For the medium buildings with 7 to 14 appartements (... building and ... appartements) and the smaller condominiums with 6 apartments or less (947 condominiums with 3.288 apartments) the City of Mechelen developed a passive approach. When condominium associations of condominium managers of these buildings ask for information and support, the renovation counsellors from our one stop shop for single-family houses support them.

At the outset of the project, Mechelen and Ostend were in the initial phases of developing their renovation support services. Over time, both cities have made significant advancements in establishing comprehensive frameworks to facilitate renovation activities. However, their progress was also contingent upon the developments within the VEKA. It was crucial for Mechelen and Ostend to align their trajectories with the initiatives of VEKA to actively position themselves in the

[1] *Klimaatwijk Mechelse Vesten. (z.d.). https://klimaatneutraal.mechelen.be/klimaatwijk-mechelse-vesten-eindrappor*

[2] *Achtergrondinformatie. (z.d.). Mechelen Klimaatneutraal. https://klimaatneutraal.mechelen.be/achtergrondinformatie*

market and launch their support services effectively. Presently, their focus lies on bridging the gap and harmonizing their capacities with those of Antwerp. Drawing inspiration from Antwerp's successful practices, Mechelen and Ostend have structured their services accordingly. With all three cities actively participating in the renovation sector, a dynamic exchange of ideas and practices has emerged among them. This ongoing dialogue facilitates the continual sharing of practical experiences, insights, and emerging information, ensuring that their respective service offerings remain agile and adaptable to the evolving needs and challenges within the domain of housing renovation

During all our case studies most of the input is derived from the data generated in the previous Work packages, in particular work package 2 and work package 3. The data mapped and/or produced in these work packages will be extensively tested in the established case studies. The case studies will involve the collection of both quantitative and qualitative data through a process of triangulation.

Case study analysis will be used to gather relevant information, including content analysis of existing documentation, interviews with individuals involved in the renovation process and other stakeholders and survey research. The data collected will not only be used within the confines of Work package 4, but will also contribute to other Work packages, allowing for the cross-utilisation of information and findings throughout the project.

1.3. Goals and objectives

As Work package 4 is the most practical part of the whole CondoReno project, the data collected will play a crucial role in shaping the subsequent steps in the related work packages. The knowledge gained from this data will allow for the adjustment and optimisation of the predetermined trajectories and strategies.

By closely monitoring and analysing the results of the case studies, the project team will be able to identify areas for improvement, identify potential challenges and refine the approaches being implemented in other work packages. Data collected through various research methods, such as content analysis, interviews and surveys, will provide a comprehensive understanding of the real-world dynamics and experiences of individuals and stakeholders involved in the refurbishment process.

These insights will inform decision-making processes, allowing for evidence-based adjustments and refinements. Ultimately, the use of this data across all of the work packages will contribute to an improved collective regeneration process and facilitate the successful implementation of the CondoReno project.

The objective is to identify best practices for IHRS, particularly also regarding the needed policy instruments and the tools IHRS can use for assessing cost-neutral renovation of condominium case studies. This draft will be available for discussion with key stakeholders only, for example local support groups and advisory board that support the IHRS development. The deliverable will further be completed in M36 for the general audience.

2. Best practices identified for cost-neutral renovation of condominium case studies

2.1. Local adoption and adjusting of decision-support instruments for CA's

The Dutch partners have already gained experience with the living cost-optimal renovation of apartment buildings owned by homeowner associations. The Flemish partners are using this experience as a source of inspiration for the journey of the IHRS in Flanders. Stichting WoonlastenNeutraal Renoveren (WNR) provides a simplified formulation of cost-neutral renovation for CAs.

'A renovation can be carried out cost-neutral for the owner of the dwelling if the current contribution to the service costs, including the contribution for maintenance, plus the energy costs is approximately equal to the new contribution to the service costs plus the energy costs after the renovation. The new contribution to service charges includes the cost of interest and depreciation on the loan for the investment in the renovation. The maintenance contribution has been adjusted (reduced) to the new multi-year maintenance contribution after the renovation. The increase in comfort of the renovated dwelling and the potential increase in the value of the house are not taken into account in these calculations.'

2.1.1. Existing instruments in Flanders

The case in Flanders is similar to the case in the Netherlands, as in Flanders, there are several incentives and support programs available for CAs and individuals looking to undertake energy-efficient renovations. The region has launched zero-interest renovation loans, specifically for middle- and low-income households. These loans, capped at 60,000 euros, are repayable within 25 years, with local 'energy houses' offering additional advice and support (VEKA, 2023). The "My Renovation Premium" program provides financial assistance for investments in energy efficiency and home quality improvements, accessible to both private individuals and associations. An online simulator helps applicants determine the funding they can receive, based on factors like joint income and property age (MijnVerbouw Lening).

In Flanders, there have been significant changes concerning the regulation of rent indexation in relation to the energy performance of rental properties, necessitating landlords to improve their properties' energy efficiency to a certain level before letting. Failure to meet these standards could lead to adjustments in rent indexation or restrictions on letting the property. The 2018 Flanders Housing Policy Plan requires all houses in Flanders to meet minimum quality standards, including optimal energy performance achieved through measures such as roof insulation and double glazing. The plan aims to encourage landlords to improve the energy efficiency of their rental properties. Under this policy, rent indexation is allowed only for houses with EPC labels A+, A, B, or C. Properties with an EPC label of D are subject to a 50% limit on rent indexation, while those with labels E, F, or unknown cannot be subjected to any rent indexation. Buildings that don't meet these minimum requirements receive penalty points, and since 2020, if a building or apartment accumulates more than 15 penalty points, it becomes ineligible for renting (Beuselinck, 2023).

The table below gives an overview of the current Flemish subsidies available to CA's. . These subsidies aim to facilitate renovations and foster more ambitious projects. It's worth mentioning

that municipal subsidies provided by cities like Antwerp and Ghent are not listed in the table below. These municipal grants are also beneficial resources for VMEs within their respective areas, encouraging residents to engage in renovation initiatives.

In addition, the FOSSTER[3] project carried out an inventory of financial opportunities to support renovation efforts. This document identified unmet needs and gaps in funding opportunities.

More details on current subsidies in Flanders can be found at Premiezoeker.[4]

Name	Description	Amount	Level
My Renovation Grant (MijnVerbouw Premie)		varies per building section	Flemish VEKA
My Renovation Loan (MijnVerbouw Lening)	Competitive loan for energy renovation of the building	min € 1.250,- max € 60.000,- + € 25.000 for every co-owner who participates in the loan	Flemish VEKA
My Renovation Support (MijnVerbouw Begeleiding)	Advise regarding the renovation process after the development of the masterplan study. Details are being worked out, launch will be at the in autumn 2024.		Flemish VEKA
Grant for renovation masterplan study (Renovatiemasterplansubsidie)	Grant for developing a renovation master plan study for condominiums (+20 years and +15 dwellings)	€ 12.000,-	Flemish VEKA
EPC label grant (EPC labelpremie)	Grant to renovate your apartment building to label A of label B	min €2.500,- max €3.750,-	Fluvius
Property tax relief for major energy renovations	Tax relief after a deep energy renovation to E60 and (additional) insulation to 75% of shell.	50% tax relief for 5 years	Flemish VEKA

Role of the Flemish Energy and Climate Agency (VEKA)

From 1 January 2023, Flanders has introduced a requirement to renovate single-family homes and apartment buildings. Any house or apartment purchased after 2023 that consumes 401 kWh/m² or more must be renovated within five years of purchase to achieve a maximum energy consumption of 400 kWh/m² or better. Over the coming decades, this obligation to renovate will become progressively stricter.

[3] *FOSSTER-Project. (z.d.). www.vlaanderen.be. https://www.vlaanderen.be/veka/energie-en-klimaatbeleid/europees-beleid-en-financiering/fosster-project*

[4] *Premiezoeker | Vlaanderen.be. (z.d.). https://www.premiezoeker.be/*

In order to support the mandatory renovation of residential buildings, the Flemish Energy and Climate Agency (VEKA) has introduced two new instruments. Financial support for the development of a renovation master plan study and consultancy for co-owners prior to the renovation process. The inspiration for this approach comes from the model of the city of Antwerp. By offering these services, VEKA opens up opportunities for local energy houses that may not have the capacity to support such renovation efforts on their own.

2.1.2. Existing instruments at Dutch level

More details on the current subsidies in The Netherlands can be found at Verbeterjehuis.[5]

Name	Description	Amount	Level
SVVE – Grant for energy advice	Grant for energy advice regarding improving energy performance and reduction, costs and benefits. Combinable with process supervision and/or a sustainable multi-year maintenance plan	The subsidy amount is 75% of the invoice (including VAT), but not more than the maximum subsidy amounts. Overview	Dutch Central gouvernement Rijksoverheid
SVVE – Grant for sustainability measures	Subsidy for sustainability measures (insulation or other energy-saving measures, a heat pump, solar boiler or a central connection to a heat network	There are many options, depending on the measures chosen. Overview	Dutch Central gouvernement Rijksoverheid
SVVE – Grant for charging point advice	Subsidy for the costs of charging point advice	75% of the consultancy costs (incl. VAT), with a max of € 1.500,-	Dutch Central gouvernement Rijksoverheid
Various subsidies at local (municipality) and regional (province) level	Subsidies via the water boards (Waterschappen), although they are more focused on climate change such as providing rain barrels and subsidies for green roofs	Varies	Municipalities Provinces Waterschappen
Het Nationaal Warmtefonds	CA's up to eight apartments	min €1.000,- max €71.000,-	Het Warmtefonds b/o Dutch Central gouvernement Rijksoverheid
Stimuleringsfonds Volkshuisvesting	Competitive loan for energy renovation of the building		SVn independent non-profit foundation

[5] *Energiesubsidiewijzer: vind eenvoudig subsidies en leningen | Verbeterjehuis. (z.d.) https://www.verbeterjehuis.nl/*

2.2. Assessment of toolkits and financial decision tools

Currently, work package 3 is still fully engaged in mapping the existing toolkits and financial decision-making tools. This means that we will start with the tools available from the previous developments in Antwerp for the case studies in Flanders. In the future we will also test and evaluate other tools mapped and (re)developed in work package 3 in our different case studies. Underneath a brief summary of the already mapped tools. Since the previous iteration of this report (M9 - June 2023), two tools developed by the CondoReno partners themselves have been developed more fully. These tools will now be extensively tested in the ongoing case studies to assess their effectiveness and potential for further improvement.

The "Toolbox for Sustainable Mixed Condominium Associations for Housing Corporations," VvE Campagnebox, and RVO's Subsidy and Financing Guide collectively form a robust framework for Dutch housing corporations and CAs striving for sustainability. These resources offer a blend of strategic guidance, practical tools, financial models, and engagement strategies to navigate the complexities of sustainable renovations within mixed CA structures. Aimed at achieving energy efficiency and meeting National Performance Agreements, they emphasize collaboration, legal frameworks, and accessing subsidies to support a transition towards more sustainable housing in the Netherlands.

The "Toolbox for Sustainable Mixed Condominium Associations for Housing Corporations" serves as a comprehensive guide for Dutch housing corporations aiming to facilitate and accelerate sustainability transformations within mixed CAs (VvE). It addresses the challenges of aligning homeowner and corporation interests, navigating financial constraints, and achieving the necessary majority votes for implementing energy efficiency measures. By providing strategic insights, detailed processes, financial models, and stakeholder engagement strategies, the toolbox equips housing corporations with the necessary tools to meet the National Performance Agreements' objective of phasing out EFG energy labels in social housing by 2028, emphasizing collaborative efforts, legal frameworks, and available subsidies to overcome the complexities of sustainable renovations in mixed VvE structures (Aedes, 2024).

The VvE Campagnebox is a comprehensive toolkit designed to assist CAs in the Netherlands with their sustainability efforts. It offers a practical step-by-step plan, including overviews, checklists, regulations, and templates focused on technical, financial, and legal aspects of sustainability projects, while emphasizing the importance of collaboration and community engagement within CAs.

The RVO's Subsidy and Financing Guide offers a tailored overview of financial support options for various initiatives. By specifying the user's identity and project type, it presents a custom selection of available subsidies and financing schemes. This tool is designed to simplify the search process for financial aid, making it easier for individuals, businesses, and organizations to find relevant funding opportunities for their plans.

LCC calculation tool for building managers by HoGent

This tool is designed for budgeting a reserve for future costs and for visualizing the difference in value when co-owners fail to build adequate reserves to meet future building costs. It utilizes DCF valuation and life cycle costs. After research, it has been determined that we unfortunately cannot test this tool

ourselves. We hope to obtain feedback from other partners involved in the renovation process, such as study bureaus.

C-Real tool by Dubolimburg

This tool is a derivative of the aforementioned LCC calculation tool for building managers. This simplified version can be used to obtain a basic calculation without requiring a specific technical background. It is an Excel worksheet designed to assess the financial impact of an energy renovation on a Community Association (CA) in a straightforward and structured manner. The worksheet considers a period of 20 years, taking into account both the lifespan of the energy renovation and its financial implications for the CA.

Financing matrix by the Flemish Partners

The initial development of the tool by the city of Antwerp was aimed at helping individual property owners to understand renovation costs. Receiving a dossier with estimates or quotes for an entire apartment building can often be daunting for individual residents, who sometimes overlook the reality that they only have to contribute a small fraction of the total renovation costs. This tool acts as a mechanism for allocating the total renovation costs to individual owners, based on the division key set out in the deed of the relevant apartment building.

In a later phase, the functionality of the tool was extended to include the simulation of loans granted by the VME (Association of Co-Owners), both by the Flemish government and by private banks. Currently, this tool is used in all our case studies to make the renovation costs transparent for each individual owner With the support of the city of Oostende, the tool has been further developed to include the available subsidies for both the community of co-owners and individual residents.

In addition, the city of Mechelen has developed a similar tool to simulate grants for each individual owner. This tool serves as a complementary complement to the one developed by the city of Antwerp, and it is our ambition to integrate and interlink these two tools in the future.

Housing cost neutral tool by WNR / KERN

WNR has developed a simplified calculation module especially for the CondoReno project to give the owners of a CA insight into the housing costs before and after renovation. This is to provide a general indication of the financial consequences of a renovation. The data presented consists of two parts.

On the one hand, a housing cost-neutral renovation budget is calculated based on potential savings on energy costs and reduction in the reservation for major maintenance (Dutch: MJOP). In addition to the presentation of the renovation budget without and with subsidy, the budget is shown based on an estimate of the increase in value of the homes. Expanding the renovation budget with possible future additional income from depreciation obviously has no effect on the calculation of housing costs before and after renovation. At most, this can justify an increase in housing costs before and after renovation.

On the other hand, the average housing costs before and after renovation are shown in broad terms. The housing costs included in this calculation are the costs that are affected by the renovation, such as energy costs and the CA contribution (Dutch: VvE bijdrage). In addition to the

collective energy consumption for lighting, elevator, etc., the energy costs for heating and hot tap water can be collective and/or individual. After renovation, the yield from any installed solar panels can also produce collective or individual results. The CA contribution consists of the fixed annual costs such as insurance, cleaning, management costs, etc. and the reservation for major maintenance (Dutch: MJOP). If a loan is taken out for the renovation, the costs of interest and repayment become a separate part of the CA contribution.

This calculation concerns the average housing costs, in order to visualize the effect of the renovation on the entire apartment complex. In practice, this can lead to individual differences based on the use of the home, although this partly depends on the agreements made in the deed of division.

This is a simplified representation of reality and this calculation module is unsuitable for a number of situations, such as certain hybrid heating solutions.

Renovation masterplan by Antwerp / VEKA

The renovation master plan serves as a tool to provide comprehensive advice on renovation options for both common areas and individual apartments, with the ultimate goal of achieving long-term renovation targets by 2050 (0-100 kWh/m²). Until the end of 2025, homeowners' associations can use a framework agreement with a selection of study agencies to develop their renovation master plan.

The renovation master plan is primarily a technical document that contains three key components. First, it includes an up-to-date condition assessment of the building. Secondly, based on this assessment, a multi-year maintenance plan and a sustainable renovation scenario will be formulated in line with the 2050 objectives. This approach mirrors the one successfully implemented in Antwerp over several years.

Business models

By building on the theoretical recommendations derived from D2.2 (Elgendy, R., & Mlecnik,E., 2024), we will provide a robust foundation for our case studies. These recommendations will serve as guiding principles for the analysis of the different business models, and the feedback we receive from the different partner cities through testing in the case studies will allow us to test and refine these recommendations in a practical context. In this way, we will not only understand the theoretical aspects of our strategies, but also assess their applicability and effectiveness in different operating environments. This process will help us to make informed decisions and refine our business models effectively, with the ultimate aim of assessing the viability of our various business models.

2.3. Testing in 8 case studies

2.3.1. Case selection

The case studies will be set up in the cities of the participating partners, namely Antwerp, Mechelen, Ostend and the Netherlands. In Antwerp and the Netherlands, there is already an operational activity around the collective renovation of apartment buildings. However, it is in a

form that can be further developed within the CondoReno project. What this means for the case studies is that in Antwerp and the Netherlands the acquisition process has been underway for some time. As a result, the research project will be mainly about improvements and acceleration of the capacity increase of our operations. In both partner cities, a waiting list has been established of apartment buildings that are interested in participating in the renovation projects.

Since the start of the CondoReno project, Mechelen and Oostende have also started to develop and implement their services related to the in-depth energy renovation of (larger) apartment buildings. In the meantime, both cities are well on track with the introduction of their new support programme among syndics, CAs, owners, … Meanwhile, there are already a number of apartment blocks in both cities that have started the process of renovating to an A rating with the help of the Energy House.

Withing the CondoReno project 8 different business models developed in, and will be applied to the different case studies. Antwerp, Ostend, Mechelen and WNR will each present 2 case studies each? where one of the different business models has been tested. Since there is no guarantee at the beginning of these case studies that this renovation project will actually succeed in achieving label A, these 8 case studies to be highlighted will only be indicated at the end of the project. During the project, project sheets will be kept for all the case studies with key figures and an interpretation of them. These sheets will help to further highlight the 2 most representative case studies for all partners at the end of the project.

The selection process for the case studies will prioritise achieving a high level of representativeness of the housing stock within the designated areas. The selection criteria outlined in the cities' KPIs will be used as the basis for this process. Emphasis will be placed on the creation of a diverse and comprehensive overview that includes a variety of building typologies. One approach to achieve this is considering the year of construction, as these buildings construction and techniques know similar lifespan ranges and tend to exhibit similar issues. This preliminary observation has been corroborated by study offices based on their practical experience.

In addition, it may be useful to categorise buildings with different numbers of floors and dwelling units. It is recognised that the size and volume of a building can influence the masterplan study and, more importantly, the possibilities and costs of execution. City of Mechelen distinguishes four different typologies of condominiums in the projects Mechelse Vesten Climat District (2020-2022) and the EU City Facility project (2022). These identified typologies do not correspond to the categorisation that Antwerp uses today to outline the different trajectories of renovation support. Streamlining these differences and disseminating this new methodology is one of the challenges for the next steps. The table below shows the current typologies / categorisations which have already been applied by the different partner cities.

In autumn 2024 we will compare this categorisation with the typologies used by the other CondoReno partners, with the aim of arriving at a uniform categorisation for all partners.

Other selection criteria may include the neighbourhood in which the building is located, as certain areas may have higher population densities than others, presenting different challenges and opportunities. In addition, factors such as the level of ambition, the ratio of owner-occupiers to tenants and the proportion of vulnerable groups living in the apartment building can also be part of the selection process.

It is important to note that the willingness of residents to renovate and their desire to be guided and supported in deep energy renovations is acknowledged. No CA will be deprived of their right to receive the necessary support throughout the entire period.

Within the EU City Facility project, Bureau Bouwtechniek developed a categorisation of condominiums for the City of Mechelen. To collect data on apartment buildings, cadastral data was used. Here information was mainly collected on the nature of the plot, year of construction, year of renovation, if any, and number of residential units. Data on the number of bathrooms, type of construction and the like were not included because cadastral data are recorded quite sloppily. Registration codes changed over time and not all buildings had cadastral data entered consistently. The obtained list of apartment buildings based on the land register was checked manually. What resulted was a list with a unique reference code for each building.

This list was combined with a previously prepared set of data from various GIZ sources (GRBgis, 3DGRB, CRAB) and the heat demand map from VEKA, with a heat demand per statistical sector. a list of co-owned buildings in Mechelen, based on freely available data in the Crossroads Bank for Enterprises. From this latter list, the co-ownership associations of partial associations and of garages were manually filtered out.

The combination of the three datasets (cadastral, heat demand and VMEs) was then done based on the unique capakey per parcel. The list of the umbrella basic data includes the following data per cadastral parcel with multifamily housing:

- capakey - umbrella link between the three datasets
- address - mainly from the land register, for own reference
- municipality (distinguish different boroughs of Mechelen) - cadastre
- designation VME (plus name according to CBE) / no VME / social housing - data from CBE and cadastre for distinction social housing / no VME between remaining apartment buildings
- year of construction (original and last recorded year of construction) - cadastre
- year of renovation (if applicable) - cadastre
- number of housing units - cadastre
- cornice height - heat demand data (from 3DGRB)
- estimated heat demand before and after renovation - data heat demand, cumulated per capakey

Then Bureau Bouwtechniek developed following categorization of apartment buildings

- Typology 1 - very large buildings, 50 dwelling units and more

- Typology 2 - medium high-rise buildings, from 7 and 50 dwelling units

    - Typology 2a - medium high-rise buildings between 16 and 50 dwelling units

    - Typology 2b - medium high-rise buildings between 7 and 15 residential units

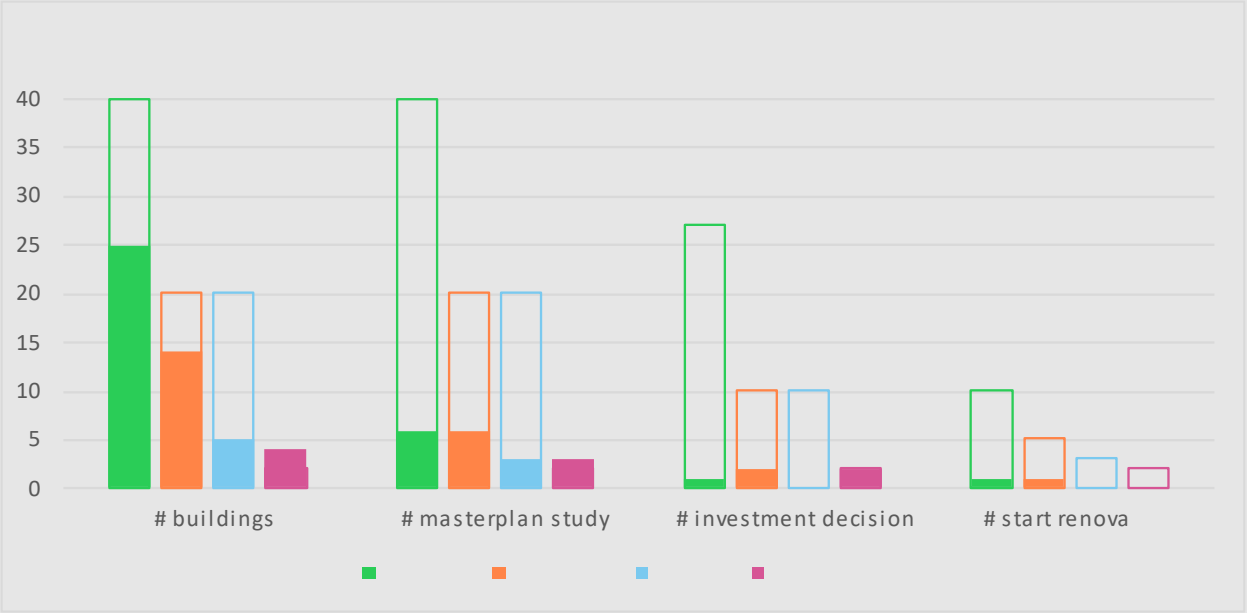
- Typology 3 - medium low-rise buildings, from 7 and 50 housing units

    - Typology 2a - medium low-rise buildings between 16 and 50 housing units

    - Typology 2b - medium low-rise buildings between 7 and 15 dwelling units

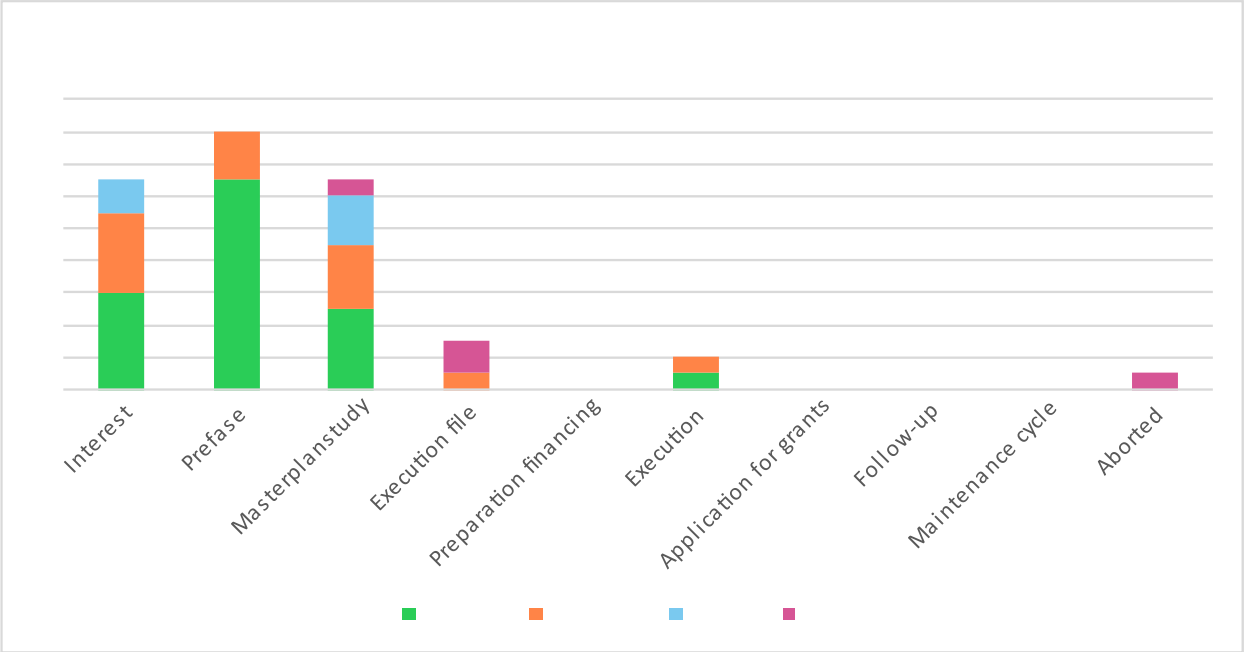
- Typology 4 - small buildings, up to 6 housing units

In line with the previous initiative by the city of Mechelen, Antwerp will commission a study in the spring of 2024, conducted by internal data analysts. The city has access to numerous sources of information, and our entire inventory of buildings within our operational area has been mapped out in our tools 'City in Map' and 'City in Figures'. These platforms enable us to access data at the district, neighbourhood, or even building level. However, there has yet to be an analysis or interpretation of this data. We aim to compile and analyse all this valuable information to better determine our future renovation strategy for the city of Antwerp and to substantiate it with measured data. The research question and specific objectives will be outlined in the coming weeks.



The table above shows the pre-defined Portfolio Indicators for each city. These are to be achieved by the end of the CondoReno project at the 48-month milestone. In addition, it illustrates the corresponding number of Collaborative Associations (CAs) in the different phases of their progress within the IHRS.

To facilitate the process of selecting case studies, a template was developed to increase clarity and facilitate comparisons between different buildings. The differences and similarities between the buildings are highlighted, allowing a side-by-side assessment of the selection criteria. Using this approach, weighted decisions can be made based on a thorough comparison of the relevant factors. This methodology is based on the approach used by the City of Mechelen when implementing the "Climate Neighbourhoods Projects": Space for Energy along the Mechelse Vesten". The template can be found in the annex for reference.



In order to track the development of all the different case studies more detailed, an additional table has been created in which all the information is collected. The phases on the x-axis are aligned with the Flemish customer journey roadmap (as defined in work package 3) As can be seen from the data in the table, all the different partner cities are currently in the process of launching these case studies.

2.3.2. Setting up the IHRS for testing in the pilot cases

Within CondoReno, the business models of Antwerpen, Mechelen, Oostende, and WNR have been identified and analysed[6][7]. These diverse business models will be evaluated and, if necessary, adjusted throughout the entire trajectory of case studies. This also applies to the previously provided tools, which now need to be optimized and tailored to our own operational context. Both internal and external factors will play a role in this process. It is crucial that we prepare our business models to intensify and accelerate renovation activities, with an eye toward potential scaling in the future. Through empirical research, we will determine which tools, templates, or manuals are required and should be adjusted to optimize feedback regarding our business models and the provided tools.

As mentioned above, in May 2023 the Flemish government (VEKA) launched an initiative for the preparation of a master plan study for larger apartment buildings. As this service is available, there is no need to develop tender documents for Mechelen and Ostend or to adapt the documents for Antwerp. All tenders will be carried out in this way as long as this service is available.

Since October 2023, the city of Antwerp has started to implement the renovation masterplan for apartment buildings with less than 15 units. However, it has been found that it is more difficult to involve buildings of this size than larger apartment complexes. A significant factor in this challenge is the cost of the masterplan study prepared by technical consultants. The cost of an engineering study for 15 units is comparable to that for buildings with 30 or even 100 units. However, because the costs are shared among a smaller number of co-owners, the individual share becomes disproportionately high, creating a barrier and resulting in a significant upfront cost.

In an effort to address these issues, we are working with the three Flemish partner cities to develop a 'renovation masterplan light'. The aim is to streamline the content of the masterplan study, thereby reducing the financial burden on individual residents. Through the study of various exemplary reports and a critical review of the existing specifications for the preparation of the renovation masterplan, we aim to offer a viable alternative for apartment buildings with less than 15 units. This alternative is expected to be characterised by a reduced cost of the study work, while maintaining the same end goals, namely a roadmap towards achieving Energy Label A status by 2050.

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[6] *Elgendy, R., & Mlecnik, E. (2024).* 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. *CondoReno.*

[7] *CondoReno. (2024, 15 februari). New report: Activating business models for condominium renovations. CondoReno. https://condoreno.org/new-report-activating-business-models-for-condominium-renovations/*

By subjecting this process to testing, evaluation and necessary adjustments, we aim to lower the threshold for participation in the Renovation Masterplan and extend the eligibility of more buildings for energy efficient renovations. Ultimately, this effort will contribute to a more sustainable future for our urban landscapes.

2.3.3. Getting the CA to engage in a coaching process including a feasibility study and long-term financing scheme

The approach that is used in Flanders and in the Netherlands is very similar. Sometimes the nuances are different or the order of the steps is slightly different, but in general the approach is similar. These nuances will be better identified in the near future by aligning the customer journeys of the Flemish and Dutch partners. Following the acquisition of interested residents or condominium managers, it is essential to generate widespread enthusiasm within the community for the ambitious and energetic renovation of their apartment building. Through an information session, the renovation coaches of the energy houses / cities explain the comprehensive masterplan study to the residents of the specific apartment building, addressing key issues such as the motivation behind the study, the project's progress and the ultimate objectives of the masterplan study. This meeting serves as a platform for residents to articulate their questions and concerns. Residents are invited to sign a declaration of engagement once support has been built and there is general enthusiasm.

An earlier European project, Interreg Northwest Europe ACE Retrofitting[8], involving various stakeholders including the city of Antwerp, had already produced several relevant documents to support the ongoing collective renovation efforts. One of these documents is the declaration of engagement. The declaration of engagement is a formal document in which they pledge their active participation in the process and their commitment to pursuing the most ambitious renovation scenario possible. In addition, this document also requests consent, in accordance with GDPR legislation, to use the data generated during the process for our research efforts. As part of the CondoReno project, we have revised and improved this document in collaboration with our Flemish partners. As a result, we have jointly arrived at a new basic document, which each partner has subsequently customised to align with their specific needs and circumstances. The Dutch partners are finalizing their declarations, such as a last juridical check. Antwerp, Mechelen and Ostend have finalised their documents, although this does not mean that there may not be changes in the future as a result of lessons learned. The declaration of engagement letters can be found in the annexes. Once this document has been signed, we will be able to move on to the next phase of the refurbishment masterplan.

The next phase involves the compilation of a basic dossier containing comprehensive details of the building in question, including general, social, structural and technical information. This information, supported by relevant documentation, is important in two ways: firstly, it enables the study office to prepare a reliable proposal for the development of a masterplan study. Secondly, it serves as a valuable resource for conducting in-depth analysis and facilitating the final masterplan study.

[8] *Accelerating condominium energy retrofitting (ACE-Retrofitting). (2020, 27 maart). Interreg NWE. https://vb.nweurope.eu/projects/project-search/accelerating-condominium-energy-retrofitting-ace-retrofitting/*

In order to gather valuable information from individual residents, an online survey is being conducted by Antwerp. The survey is carried out in the preliminary phase to gather feedback and identify their wishes and needs. This survey serves two purposes: firstly, to actively involve the residents in the renovation process and secondly, to complement the visual assessment carried out by the external study office to identify structural problems in the buildings.

To improve the effectiveness of this preliminary process, a series of interviews were conducted with the study companies responsible for overseeing the production of the masterplan study. The primary objective of these interviews was to gain a clearer understanding of the specific information needs and timing requirements of the stakeholders involved, with the intention of facilitating a seamless process. Discussions were also held on the quality of existing documentation and potential avenues for improvement.

It is important to note that not all interviews with external study offices have been completed and although an initial report has been produced, the dataset remains incomplete.

The partnership between VEKA and the Flemish Energy Houses facilitates a joint process of evaluation and feedback. The results of the interviews conducted with the study offices involved in the project will be communicated to the Flemish government in the coming days. The effectiveness of the platform is crucial to ensure a streamlined process for condominium associations and the efficient development of master plan studies, supported by the availability of the necessary documentation from the study offices. Positive experiences by the demand side will help to increase the number of applications and to achieve the climate targets set by the European Union.

2.3.4. Feasibility study + budget neutral investment plan (incl. financial offer)

In the customer journey captured by the CondoReno project, several key moments have been identified. These moments are characterised by collective decisions made by all owners to either continue the process, take a step back to redo a part of the process or discontinue the renovation process. Three of these moments have been identified as critical decision points for the in-depth evaluation of our case studies.

These three moments are:

1. The preparation of the feasibility study,
2. The majority vote to undertake one or more works to achieve an A label
3. The start of the actual work.

As we navigate through our project case studies, we will pay particular attention to these key moments. We will evaluate the lessons learnt at each milestone to inform subsequent case studies. WP6 (Evaluation of the IHRS) will further refine and develop the evaluation parameters. This will help us to better evaluate the ongoing case studies.

In the context of the CondoReno project, it is worth noting that most apartment buildings are currently in the earlier stages of the renovation process. Decision-making moments within the Owners' Association (VME) are less frequent due to the mandatory annual meeting. Throughout a renovation project, we strive to encourage multiple meetings and subsequent voting, yet the decision-making timeline remains longer compared to single-family homes. The upcoming period

will provide us with further insights into these significant key moments in the renovation trajectory of apartment buildings.

For one of the Dutch case studies, CA Lucellestraat in Amsterdam, the feasibility study has been completed and presented to the homeowners. It was well received. They have asked to submit a proposal for the next phase, the so-called 1st deepening phase (Dutch: 1ste verdiepingsfase). One of these days (summer 2023), this proposal will be submitted to the CA board. Unfortunately, right now (March 2024) we still didn't receive a positive reaction, and this happens more often is our experience with CAs. The volunteers in a CA board are regularly distracted by other priorities in their lives. In this specific case, the role of the social housing association also plays a role, which was continuously very cautious. The latest development is that we are trying to get this project back on track in cooperation with the municipality of Amsterdam.

Unfortunately, one of the Dutch case studies also interrupted the renovation process. In the case of CA Het Bentjen in Brunssum, the feasibility study was also completed successfully and presented to the homeowners. As a result, they agreed to develop the model further in what is called the design phase. This phase has now been completed, but unfortunately, before we had the opportunity to present our model, the board of the CA decided to put an end to the collaboration. Further information on this project and a preliminary analysis of the reasons for the termination of the project will be available later on.

2.4. Optimizing IHRS based on renovation experiences

Based on the experience gained so far in Antwerp, as well as the first efforts made in Mechelen and Ostend, certain obstacles and opportunities for improvement have been identified. In the coming stages of the CondoReno project, including this specific work package and others, this input will be evaluated and integrated in a systematic way. Additional challenges will be identified as the results of mapping of the different business models and the development of the tools are further developed and tested on the different case studies.

2.4.1. Masterplan renovation studies by VEKA

See *3.2.3 Getting the CA to engage in a coaching process including a feasibility study and long-term financing scheme* for initial initiatives to identify barriers and explore possible improvements and acceleration. The trajectory that was set up by the Flemish government, VEKA, is a parallel development and this was not yet present at the proposal stage. This possibility offers a new perspective on project development.

2.4.2. Synergies with ongoing developments

Within the CondoReno project, there are promising avenues to build upon the achievements of another European initiative, namely the LIFE-integrated project known as BE REEL!! (LIFE IP CA 2016 BE REEL!!). Launched in January 2018 and slated to continue until December 2024, BE REEL! aims to ensure Belgium's alignment with the renovation targets set for 2050. However, given its broader focus beyond multi-residential buildings, there exists an opportunity for CondoReno to pilot and assess tools specifically tailored for use in apartment complexes. Moreover, the CondoReno project could leverage the BE REEL! platform for disseminating tools developed within

its own framework. Initial discussions with the BE REEL!! project team are underway to explore avenues for collaborative development and synergy..

The last months several other European and national projects are launched with energy efficiency and/or one stop shop as a focus, e.g.:

- FOSSTER - Flemish One-Stop-Shop Towards Energy-efficient Renovation (VEKA with a consortium of energy houses): this Life project aspires to develop a one-stop-shop model for different types of homeowners, in order to lower the threshold for moving to an energy-efficient home renovation. Within this model, existing successful support processes of the energy houses will be incorporated. An additional offer is also being developed to relieve homeowners of even more administrative, technical and financial worries. The Flemish energy houses within the project consortium will test the FOSSTER model as part of their services. Once the concrete offer and the business case have been validated, the concept will be offered to all other energy houses in Flanders. Both Antwerp and Mechelen are partner in the FOSSTER project. The will seek and monitor potential synergies between FOSSTER and CondoReno.

- C-REAL (Dubolimburg, Onesto, Province of Limburg): this Horizon 2020 project is a research project that aims to establish a permanent and structural cooperation between a lender (Onesto) and a renovation advisor (Dubolimburg) to increase the renovation rate and renovation quality in the province of Limburg. To achieve full customer satisfaction, effective cooperation between the renovation advisor and the construction sector will be established.

- Digital neighbourhood renovation tool (EnergyVille/ Vito): with this tool, commissioned by the Flemish government, the renovation needs of entire neighbourhoods can be mapped digitally in one go. Specific advice can then be given per dwelling, linked to guaranteed follow-up. The tool will run on a new digital platform that will be developed by EnergyVille / VITO.

- Tandems (City of Mechelen, Klimaan, e.a.): this Life project aims to encourage the development of energy communities as vehicles for energy transition through including citizens in every step, engage local governments and policy makers to support and invest in these communities. In addition the project want to create replicable and informative strategies, which provide helpful guidance for future communal energy projects. City of Mechelen will explore in this Tandems project the installation of solar panels on roofs of condominiums. Mechelen will integrate the insights from the Tandems project in the CondoReno project work.

- BE FREE - Belgian Financing Roundtables on Energy Efficiency (VVSG, Embuild, e.a.): this Life project aims to adapt innovative financing solutions for energy-saving measures developed abroad to the Belgian context and to test them. To this end, the project partners will organise roundtables where several actors from the quadruple helix, systematically identify the main financing challenges and address them one by one. Embuild Flanders is a partner in this project and will monitor synergies with CondoReno.

All these different possibilities for cooperation and continuation are currently under investigation. The proposals and conclusions will be taken into account in the further development of the CondoReno project. We are currently in the process of introducing CondoReno to these projects and vice-versa. An evaluation of maximising these synergies will be carried out at the end of the year.

3. Planning

The following section presents the project planning for work package 4: Proof of Concept. This planning has been formulated today with meticulous consideration of all pertinent elements and their interconnections within the CondoReno project. It is imperative to acknowledge that this planning is dynamic and subject to change due to external factors.

- → 24th of April: Workshop with WP6 to encourage co-creation between work packages
- → September 2025: final report

4. Conclusions

In our forward-looking perspective, we are aiming for a thorough testing phase in which both the various tools and the business models developed will be critically evaluated by all partner cities based on their respective case studies. Each city faces unique challenges in implementing energy-saving renovation projects, requiring a nuanced approach. To bridge these contextual differences, we will draw on the expertise and experience of all partners to align systems and strategies. Test cases will be set up to validate and refine our Integrated Home Renovation Services (IHRS), with an emphasis on cost neutrality and customer focus.

Both existing and newly developed tools within CondoReno will be tested at different stages of the renovation process. By testing them on 80 unique case studies, we can gain insights and implement optimisations where necessary. In terms of testing business models, initial steps need to be taken to involve the supply side more closely in our current operations. Once these initial steps have been taken, we can also test, evaluate and optimise their viability. Throughout the evaluation of both tools and business models, we always keep in mind the possibility of scaling up.

By promoting continuous feedback loops between developments in other work packages and pilots, we strive for iterative improvement and alignment with project goals. Collectively, our aim is to develop an IHRS that holds promise for achieving sustainable and effective solutions for housing rehabilitation in diverse contexts.