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**Supporting the “supply” side - Taking off Master plan for condominium ambitious energy retrofitting**

**Model of specifications**

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*Prepared by Energy House Antwerp – Deliverable DT3.1.3*

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# Glossary and Abbreviations

# Glossary

|  |  |
| --- | --- |
| Name | Definition |
|  |  |
| Lifecycle | Building life cycle refers to the view of a building over the course of its entire life |
| Lifespan | Typical Life Expectancy of the building component |
| Total Cost of Ownership | The purchase price of an asset plus the costs of operation. When choosing among alternatives in a purchasing decision, buyers should look not just at an item's short-term price, which is its purchase price, but also at its long-term price, which is its total cost of ownership. |
| Sustainable long term maintenance plan | The intention is that property should be maintained in a sustainable, safe and secure condition. The long term goal for maintenance services is to introduce a planned maintenance programme and secure funds to accelerate implementation of Long Term Maintenance (LTM) and compliance issues across the building. The purpose of LTM planning is to establish the strategic maintenance requirement for the building, to allow financial planning, to accommodate that requirement, and plan, to maintain the building in good condition by replacing or renewing ageing facilities, improving efficiency and maximising whole life asset performance. It is essentially planned maintenance over a longer time horizon than a single financial year. |

## Abbreviations

|  |  |
| --- | --- |
| Abbreviation | Explanation |
| BAU-scenario | Business as usual - Scenario |
| LTM | Long Term Maintenance |
| EPBD | Energy Performance Directive |
| E-level | Evaluation of the energy usage, based on EPBD-regulation |
| TCO | Total Cost of Ownership |
| LU | Living Units |
|  |  |
|  |  |

# Why develop a Master plan audit for ambitious energy retrofitting of condominiums?

## Introduction

At the end of the 60’s and 70’s, condominiums sprung up from the ground around the Flemish central cities. In the span of a few years, buildings of 10 + stories changed the Antwerp skyline. These buildings are now over 50 years old and are showing their age. Most of them need a thorough renovation.

While trying to improve the energy performance of their buildings, owners and potential investors are faced with multiple barriers.

Besides the financial planning, the biggest difficulty is the shortage of knowledge about the approach taken: how to start, which measures to take first and all of this without taking into account the global approach.

The aim of the Master plan audit is to develop a coherent and transparent roadmap for the improvement of the energy performance of the building and to create a healthier and more comfortable living environment. In order to get an optimal and innovative renovation, it is important to always keep the the final objective in mind: the creation of a future proof building!

To reach the best possible energy performance of the building, the target should be to achieve the same standards as in a new build project. In this, the technical and economic feasibility as well as the architectural limitations of the existing building should always be taken into account.

Furthermore, the renovation should fit into the short, medium and long term perspective of the lifecycle of the building. Significant maintenance or improvement works, e.g. on external façades, walls and roofs, should be accompanied by an improvement in the energy performance of the respective building component.

The philosophy is that undertaking performance upgrades at the same time as maintenance work reduces overall costs and disruption.

By creating this individual renovation roadmap from the start, a technical lock-in effect is avoided by defining the relation between and impact of different measures.



1 A more complete roadmap avoids lock-in effects (Source Building Performance Institute Europe)

This Master plan audit also aims at estimating the real cost of the use of the building, not only the direct costs such as the necessary investments but also the indirect costs such as e.g. the cost of energy consumption and the yearly maintenance costs. After all, a higher investment often leads to lower maintenance costs.

This real cost, the ‘Total Cost of Ownership’ (TCO) is also called a lifecycle cost analysis, due to all costs made during the economic lifetime of a building being charted, not only the cost of the investments.

For this reason, this study depicts a clear image of the structural and installation engineering aspects, safety aspects and housing quality of the building. It states which replacement investments and which investments required by law are necessary over the next 20 years.

This is in line with the composition of a Sustainable Long Term Maintenance (LTM) Plan for the necessary replacement investments in the building and in this study this will be referred to as the Business as Usual scenario (BAU-scenario). A BAU-scenario, because this is a necessary investment plan which is uncoupled from the desired low energy renovations.

By low energy renovations, the measures are taken further so as to increase the energy performance and living quality of the building. The necessary replacement investments and refurbishment works are combined with energy efficient actions.

## Renovation ambition

The level of the energetic ambition of the renovation should be in line with the EPB standards for thorough energy retrofitting and should, if possible, aim to reach the expected legal standards for 2050, for existing residential buildings.

The desired minimum for the E-level of the renovation is E90, which is equal to the current norm for retrofitting a residential building.

The current requirement in Flanders is E60 (100kWh/m²) for new build and the long term ambition for existing residential buildings by 2050. The starting point is, where possible, to strive for an E-level of E60 for new builds.

As mentioned above, the technical and economic feasibility, as well as any architectural limitations are always taken into account.

For additional EPB-requirements regarding thermal transmittance etc. we refer to the webpage of the Flemish Energy Agency.

<http://www2.vlaanderen.be/economie/energiesparen/epb/doc/epbuwaarden2016.pdf>

# Guidance

## Preface

By participating in the European Interreg-NWE project Accelerating Condominium Energy Retrofitting (ACE-Retrofitting), the city of Antwerp lays the foundations for the assistance of performant renovation of condominiums

The city of Antwerp supports the co-owners and the trustee by supplying a renovation coach in order to create a sustainable long-term vision tailored to the needs of the building and its inhabitants. The first step in this is the setting up of this Master plan and to advise about the implementation of the measures.

The city of Antwerp establishes a bridge between co-owners, trustees, study team and the building sector. Together these partners can accelerate the energy retrofitting of condominiums!

In the preparatory phase of this tender, a master file for the building is put together. This file contains the basic information about the building and the additional prerequisites for the renovation. This will be explained in chapter 3 and 4.

Chapter 5 is the explanation of the technical specifications of the actions expected in this Master plan

Chapter 6 specifies how the renovation coach can calculate the possible subsidies for the different renovation scenarios in the study. Furthermore, a number of financing schemes are proposed.

Chapter 7 gives the time frame for the output of the deliverables.

Chapter 8 shows the requirements for the proposal: quality requirements based upon expertise and credentials as well as a template for the price breakdown for this study.

## Roles of the stakeholders within the development of a renovation roadmap.

Several stakeholders are involved in the entire process of the Master plan: during the pre-phase, the Master plan audit and the roll-out phase.

The roles of the different stakeholders throughout the different steps are described below. More precisely, the role of:

* Residents
* Co-Owners | Board of co-owners
* Trustee or building manager
* Auditor | Architect – Technical consultants
* City of Antwerp | Renovation Coach
* Contractor

| **Roadmap** | **Step** | **Main tasks** | **Coach****City of Antwerp**  | **Co-owners** | **Trustee or building manager** | **Auditor** | **Contractor** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Pre-phase | Data –inventory | Collection of basic data for the master file of the building |  |  |  |  |  |
| Requirements | Draw up an overview of known defects and needs  |  |  |  |  |  |
| Determination of the outlines and requirements of the renovation |  |  |  |  |  |
| Tender audit | Preparation of the tender of the Master plan audit  |  |  |  |  |  |
| **Master plan audit** | **Diagnosis current status building** | **Start-up meeting**  |  |  |  |  |  |
| **Site visit and global audit**  |  |  |  |  |  |
| **Analysis** |  |  |  |  |  |
| **Reporting** |  |  |  |  |  |
| **Design of the renovation roadmap** | **Design of BAU-scenario** |  |  |  |  |  |
| **Design of scenario E90 & E60** |  |  |  |  |  |
| **Reporting** |  |  |  |  |  |
| **Preparation Roll-out** | **Cost estimation of the total roll-out of the scenarios** |  |  |  |  |  |
| **Financing options and available subsidies**  |  |  |  |  |  |
| **Presentation of the conclusion of the results of the Master plan Audit** |  |  |  |  |  |
| Roll-out | Additional surveys | Implementation plan |  |  |  |  |  |
| Final draft | Detailed engineering studies |  |  |  |  |  |
| Detailed technical file  |  |  |  |  |  |
| Tender | Tender document specification |  |  |  |  |  |
| Tender |  |  |  |  |  |
| Monitoring of the implementation | Project- and quality managementDeliveryQuality and safety coordination  |  |  |  |  |  |

# Building File: ‘Name of the building’

In the pre-phase, already quite a lot of data of the condominium: ‘Name of building’ located in ‘address of building’ have been collected.

## Master file

The master file contains the following information:

* General information about the building facility
* Organizational aspects of the co-owners and the trustee
* Building characteristics and urban planning restrictions/current architectural regulations
* Historical energy-use of the building
* Overview of the available planning material, technical data of the building, performed studies, obligatory audits, inspections or conformity certificates
* Overview of the maintenance history and planned (yearly) maintenance
* Overview of the replacement investment history and planned |needed replacement investments
* Overview of the known problems in the building

These data are bundled in Annex 1

## Residents and owners survey of needs

In addition to the master file, the needs of the tenant, the occupant-owner and the owner-lessor of the building are documented.

The goals of this survey of needs are, on the one hand, mapping the priorities, difficulties and wishes concerning the communal areas of the building and on the other hand mapping the comfort-related problems of the individual housing units e.g. humidity, mould and overheating. We list the investments made in the private housing units that are linked to the planned renovation work such as recently replaced windows, heat emission system etc. Existing EPC certificates are added to the master plan of the building.

It is important to use the results of the survey in the Master plan audit to evaluate the current condition of the building (Chapter 5.2).A solution to the defined problems can be described in the renovation roadmap (Chapter 5.3). The results of this survey are bundled in Annex 2.

# Additional requirements for the renovation

|  |
| --- |
| This chapter will be adapted to the situation and requests of the specific condominium . |

## Spatial quality and urban development

### Urban planning restrictions

The current urban planning restrictions for this building will be listed in Annex 1. These restrictions define the urban planning for the renovation, more specifically:

* Where we have to take into account the building line when insulating façades
* Current restrictions of the building line (possibilities of increasing building volume)
* If the building of additional floors is possible under the current planning restrictions
* Should there be any architectural heritage present to be taken into consideration

Apart from that, the city architect and the building aesthetics committee advise about the spatial quality of the architectural projects when confirming the planning permission. This is why it is recommended to ask the relevant services for advice when receiving the preliminary draft.

The building aesthetics committee advises about elements with a direct impact on the defining features of the project.

* Use of different materials after insulation of the façade
* Placement of external sun blinds
* Placement of renewable energy installations with a possible change to the appearance of the building (e.g. Installation of photovoltaic panels on external walls)

For more information on the applied criteria, we refer to the regulations of the Building Aesthetics Committee.

(see <https://www.antwerpen.be/nl/info/52d5052239d8a6ec798b495c/welstandscommissie> )

|  |
| --- |
| After a preliminary discussion with the Urban Planning Services we can list the following points of attention: |

For further questions with regard to this information, please contact Urban Planning Services

### Strategic Vision on Energy - Antwerp

The City of Antwerp’s goal is to be a climate neutral city by 2050. Our whole urban landscape needs to be made ready for this challenge.

The Strategic Vision on Energy – Antwerp, has been set up in order to facilitate this transition.

The study will highlight which areas are ready for which energy concept. When a city neighbourhood is being renewed, there is an opportunity to apply the most suitable sustainable energy concept.

A vision will be written up during the course of 2018, and the detailed strategic vision on energy will be worked out by the first quarter of 2019.

Given that this Master plan audit will increase the lifespan of a building, it is essential that the outlines that are already known are included into the development of the Master plan. This information can be used as a consideration framework when, for example, looking at a boiler renovation and the possibilities to use renewable energy sources.

The guiding principles for the Master plan should be based on the Trias Energeticas: first reduce energy consumption, then make maximum use of renewable energy and only use fossil fuels where absolutely necessary.

|  |
| --- |
| For this building, we can recommend….. Any further questions regarding this information should be directed to the Renovation Coach.You can find the contact details in Chapter X |

### Mobility

The goal of this study is to increase the lifespan of a building. This is therefore a good moment to consider whether the current mobility availability is sufficient for the future residents of the building.

Below is a list of possible needs in the future:

* **Car or cargo bike Share:**

Do you only rarely need a car? For example, when carrying heavy shopping or for a family visit? Then your car stands still most of the time. Sharing a car with others is cheaper and better for the environment, and there will be less need for parking spaces (see <https://www.antwerpen.be/nl/info/556472a5b1a8a7f6748b458d/autodelen-1> )

* **Transforming private parking spaces into community spaces** (property):

A car share system will diminish the need for private parking spaces. The core idea behind Garage Swap is to exchange the cost of underground parking spots in new builds for a starter budget that promotes sustainable transport sharing and sustainable energy for the condominium. The balance is invested in sustainable energy production and energy saving.

Underground parking is swapped for sustainable solutions in the area regarding transport and energy. For more information over this concept, please go to: <http://www.garage-swap.be/> .

* **Charging poles Electrical vehicles and E-bikes**

An electrical charging point in the garage or in the communal areas can be desirable if some of the residents own an electrical car or if an electrical share-car is available.

|  |
| --- |
| For this building, we can recommend…Further questions regarding this information should be directed to the Renovation Coach.You can find the contact details in Chapter X |

### Utilities & Infrastructure

Stability works and drilling in the ground can come about from the execution of major renovation work. Other works could be required to change technical pipes or the adapting of a renewed energy concept for the building.

To know whether these works are possible, it is important to always:

* Define where underground pipes and cables can be found. This is possible via ‘Kabel en Leiding Informatieportaal (KLIP), for more information go to: <https://www.vlaanderen.be/nl/bouwen-wonen-en-energie/elektriciteit-aardgas-en-verwarming/uitwisseling-van-plannen-van-ondergrondse-kabels-en-leidingen-kabel-en-leiding-informatieportaal#procedure>
* Define where Underground metro lines can be found.

|  |
| --- |
| Imminent work on utilities and infrastructure is planned for this building in its street|neighbourhood.This can be an opportunity to solve existing bottlenecks in utilities or infrastructureFurther questions regarding this information should be directed to the Renovation Coach.You can find the contact details in Chapter X |

# Requirements for the Master plan audit

This chapter shows a clear overview of the different steps and main tasks to be performed during the Master plan audit.

This Master plan audit consists of 3 large parts:

* Diagnosis of the current status of the building
* Development of a sustainable long term plan for the building (BAU Scenario) and an energy renovation roadmap for 2 scenarios: E90 and E60
* Preparation of the decision for implementation of the proposed scenarios

These different steps are depicted in the following scheme with a detailed explanation of every step.

|  |  |  |  |
| --- | --- | --- | --- |
| **Master plan audit** | **Step** | **Main tasks** | **Chapter** |
| **Scope of the audit** | **General** | **5.1** |
| **Required elements** |
| **Optional elements** |
| **Diagnosis current status of the building** | **Start-up meeting**  | **5.2** |
| **Site visit and audit** |
| **Analysis** |
| **Reporting** |
| **Design of the renovation roadmaps** | **Design BAU -scenario** | **5.3** |
| **Design scenario E90 – E60** |
| **Reporting** |
| **Preparing roll-out** | **Cost estimation for total roll-out of the scenarios** | **5.4** |
| **Financing schemes and subsidies** | **6** |
| **Conclusion** | **Presentation of the conclusion of the Master plan audit** | **5.5** |

## Scope of the Master plan audit

### General information

The aim of the Master plan is to develop a coherent and transparent roadmap for the improvement of the energy efficiency of the building and to create a more healthy and comfortable living environment and this for a short, middle-long and long-term perspective.

Therefore, this study does not only focus on the energy efficiency of the building but it also shows a clear image of the condition of the building. This applies to the following building elements of the common parts: building quality and building physics, technical installations, public utilities, (fire) safety and general living conditions

The following elements will be taken into account throughout the Master plan, which means that they have to be evaluated when analysing the existing condition of the building. The solution to the observed bottlenecks should be incorporated into the sustainable multi-annual planning and the 2 renovation roadmap scenarios.

|  |
| --- |
| **Standards and regulations**After examination of these elements or the proposal of adjustments, these elements will be checked against the current legislation and regulation and the technical requirements. This does not mean mandatory inspections or audits will be executed.These are amongst others (non-restrictive):* European Guidelines and Belgian standards if applicable
* The Butgb (<http://www.butgb.be/> ) en UeATC(<https://www.ueatc.eu/about_ueatc/> ) certifications and | or directives
* The regulations of WTCB (<http://www.wtcb.be/homepage/index.cfm?cat=publications> )
* General regulation of Electrical Installations (<http://www.werk.belgie.be/defaultTab.aspx?id=593#AutoAncher0> )
 |

|  |
| --- |
| **Inspection versus limited destructive and additional testing**The analyses in this audit are executed in the first place through a visual inspection. Additional destructive or more profound research can be necessary to:* Be able to correctly judge the size and the extent of the determined damage to be able to propose a correct solution. E.g.:
	+ Evaluation concrete decay (core drilling, carbonation and chloride determination, lab examination…)
	+ Lab examination for the presence of hygroscope salt
	+ …
* Determine the various layers of the roof and façade structure -if unknown. This is crucial to be able to correctly calculate the E-level and to be able to consider the renovation scenario. Drillings or more profound research can for example be necessary for the determination of:
	+ Structure, thickness of materials and material features
	+ Suspension of the current façade finishes
	+ Possibility of anchoring tested by a pull test
	+ Detection of the current reinforcement of concrete terraces

If necessary, the audit team will immediately communicate the necessity of this additional testing to the client. A request for additional charge will be submitted, this request includes at least the price of:* The necessary examinations (to be executed independently or by a sub-contractor)
* If required the reparation works executed by professionals of damages caused by a limited destructive test.
 |

### Mandatory elements

The aspects below should be taken into account in the analysis.

|  |  |
| --- | --- |
| **Subject** | **Component** |
| General safety | Height parapet  |
| Fall prevention |
| Presence lifelines, anchor points |
| Asbestos inventory | Visual inspection of asbestos containing elements in the common areas |
| Fire safety | Quick scan and evaluation of the compliance with regulations and standards |
| Supporting structures |
| Partitioning |
| Spread of fire |
| Evacuation routes, escape routes and fire escape ladders |
| Ventilation of the fire escape stairways and lift shafts  |
| Signalisation and safety lighting |
| Presence of fire detection and fire alert |
| Mobile fire extinguishers and hose reels |
| EE-standard Flemish Housing Code | Conformity Flemish roof insulation standard (2020) |
| Conformity Double glazing standard (2023) |
| Electricity | Visual check |
| Check presence of inspection in line with regulation, with minimal regulations about safety  |
| Building envelope | Outer shell elements (roof, façade, floor, windows and doors) |
| Concrete decay |
| Wood rot |
| Thermal bridge analysis and risk of mould |
| Overheating |
| Stability: check of the strength calculations of the supporting structure(terraces and balconies, subsidence and crack formation) |
| Rain penetration and water infiltration |
| Technical installations | Inspection of the communal technical installations: HVAC, SWW and lighting |
| Ventilation system (air quality standards) and airtightness |
| Lifts | Conformity regulation and standards for preventive inspection and risk analysis  |
| Ventilation system (for individual residential units, mould and condensation problems) |
| Technical cables | Cables of all utilities |
| Technical shafts |
| Accessibility | Conformity with regulation about accessibility |

### Optional Elements

|  |  |  |
| --- | --- | --- |
| **Subject** | **Component** | **tick** |
| Drainage grey and black waste water | Drainage pipes |  |
| Septic tank |  |
| Sewage |  |
| Acoustic sound insulation  | Evaluation façade |  |
| Evaluation internal walls |  |
| Biodiversity | Possibility green roof |  |
| Possibility green façade elements |  |
| Water | Rainwater recuperation  |  |
| Placement meters per residential unit |  |
| Mobility | Car or cargo bike share |  |
| Transforming private parking spaces into community spaces |property |  |
| Charging poles Electrical Vehicles and E-bikes |  |
| Building volume and Aestetics | Additional floor (in line with 4.1.1) |  |
| Increasing the building line (in line with 4.1.1) |  |
| Placement of external sunblinds |  |
| Renewable energy | Placement of renewable energy installations with a possible change to the appearance of the building (e.g. Installation of photovoltaic panels on external walls) (in line with 4.1.1) |  |

## Diagnosis current status of the building

### General requirements

This first step should create a clear image of the current condition of the building; in this the diagnosis of the current status of the building is evaluated.

We take into account the required and optional building elements of the common areas (cfr paragraph 5.1): building quality, building physics, technical installations, public utilities, (fire)safety and general living conditions

### Analysis of the available information

The available information about the building will be studied prior to the design of the master plan (chapter 3, annex 1 and 2). This way there will be a first image of the building, the maintenance history and the needs of the residents and owners.

### Start-up meeting

This official starting point of the Master plan audit (Chapter 7) has to be considered in the planning timeline. The start-up meeting contains at least the following elements:

* Information exchange prephase:
	+ Data-inventory and documentation list (Chapter 3)
	+ Requirements for the renovation design (Chapter 4)
	+ Level of ambition and specific bottlenecks
* Specific arrangements and agreements :
	+ Audit planning scheme : fix the necessary appointment conformations for consultations and decision points (chapter 7)
	+ Access to the building and technical installations and supervision if required

### Site visit and global audit

The quotation should show a clear overview of the planned activities during the site visit and audit

The following should be clearly listed:

* + List of experts that will be present during the audit
	+ Overview of the need of supervision of authorized persons during the audit (e.g. presence of technical building manager)
	+ Overview of the need of accessibility in specific public common areas
	+ Overview of the need of accessibility in specific private dwellings and specify location
	+ Duration of the audit (total duration in man-days)

### Analysis

The evaluation as described above will take into account the required and optional building elements (cfr paragraph 5.2) of the common parts: building quality and building physics, technical installations, public utilities, (fire)safety and general living conditions

The analysis should be profound enough to

* Check the condition of the building with the current standards and technical requirements
* Estimate the residual lifespan of the elements
* Be able to make a proposition to fix the determined defects

We refer to Annex 3 for the requirements of the analysis of the general building features and the evaluation of the engineering and technical installations.

The proposal should give a clear image of the works needed to conduct this analysis.

### Reporting

The analysis of the current condition of the building is summarised in a report.

This report will be used as a starting point for the renovation roadmaps in Chapter 5.3

## Design of the renovation roadmaps

### General

In the first place, the renovation roadmap should propose solutions to the determined bottlenecks.

Three different roadmaps will be designed, these are not necessarily completely different, the main difference between the scenarios is the intended result:

* **Business as Usual scenario (BAU-scenario):** we list the measures, replacement investments and legally required investments that are necessary over the next 20 years. This corresponds with the draw up of a sustainable long term plan for the strictly necessary replacement investments in the building and this independent of the global energy refurbishment.
* **Two renovation roadmap scenarios: E60 and E90**: An energy refurbishment is more profound: the energy performance and living quality of the building will be improved. The necessary replacement investments and refurbishment works are combined with Energy-Efficiency measures.

This Master plan also aims at estimating the real cost of the use of the building, not only the direct costs such as the necessary investments but also the indirect costs such as e.g. the cost of energy consumption and the yearly maintenance costs. After all, a higher investment often leads to lower maintenance costs.

This real cost, the ‘Total Cost of Ownership’ (TCO) is also called a lifecycle cost analysis, due to all costs made during the economic lifetime of a building being charted, not only the cost of the investments. The TCO (calculated over 20 years) is calculated for the different scenarios.

Investments aimed at improving the E-level and the living quality of the building will be an added value to the property value of the building after renovation. In the comparison of the different scenarios, this added value after renovation will be of importance.

|  |
| --- |
| The following scenarios are based upon the available plans and measurements made during the site visit. |

### BAU-scenario: defects and replacement-investments

The following aspects are necessary investments in the Sustainable Multi-annual plan of the building.

* The **residual technical lifespan** based upon the year of installation of the building element and the inspection of ageing of these elements: the replacement investments that will be necessary in the next 20 years need to be listed.
* A solution for the **defined defects of the current state** of the building needs to be proposed.
* The investments that are necessary to meet the legal requirements, e.g.
	+ Roof insulation standards
	+ Double-glazing standards
	+ …

### Energetic renovation roadmap for two scenarios: E90-E60

Besides the measures defined in the BAU-scenario, major maintenance works or improvement works can have a significant improvement of the energy efficiency of the building or the respective building elements. E.g. when renovating external walls, façades and roofs, placing insulation should be considered. It is important to work within the requirements (Chapter 4) and take into account innovative concepts where possible.

By bundling the necessary actions within an integrated master plan from the start, lock-in effects can be avoided for the further implementation of the renovation roadmap. This roadmap shows how different measures influence each other and how they should be aligned.

This integrated approach allows lower project costs and a lower impact of the building works. E.g. Thermal bridges between existing windows and façade can be more easily fixed by combining the replacement of the windows and the insulation of the façade.

### Reporting per scenario

For each scenario (BAU- E90-E60) a clear overview of the necessary measures is given.

| Renovation roadmap | Measures | Impact on EE  | E-reduction (% and €) | Investment(€)  |
| --- | --- | --- | --- | --- |
| + basic infrastructure |  |  |  |  |
| Total cost of investment |  |
| Yearly energy reduction  |  |
| Total cost of ownership (20 years) |  |
| Property value before investment\* |  |
| Property value after investment \*\* |  |

\* Current property value

\*\* Property value of recently built condominiums in the immediate vicinity with E-level E90 or E60

Particular attention should go to:

* Sequence of the measures
* Advantage of bundling the necessary measures in comparison to the individual cost per measure, and improving efficiency
* Insight in the possibility of phasing certain measures (e.g. Phased per façade)

The estimation of the investments is sufficiently detailed to judge the correct financial impact of each individual measure and possible phasing of each measure. This includes for each measure at least a clear breakdown of (if applicable):

* Unit cost per m²
* # m² per building section

It is necessary to have a detailed overview to correctly list the possible subsidy for each measure (Chapter X).

|  |
| --- |
| **The presentation of the scenarios** contains the (possible) consequences for:* Urban planning outlines |Volume
* Changes in the size of the common areas
* Changes in the size of (some) of the privately owned residential units
* Liveability |habitability of het building during the renovation
* First estimation of the total duration of the work, individual and|or integrated planning (chain approach)
* A design in line with the urban planning restrictions
	+ Visual presentation |preliminary design of the adjusted building physics (e.g. finishing of the façade, adjustment of the balconies, …)
	+ Execution options (at least 2 possible options) for visual finishing materials e.g. façade cladding materials
 |

### Comparison of the 3 scenarios

Finally, the financial impact of the 3 scenarios is compared. This includes the initial cost and the total impact of het investment over a time period of 20 years (Total cost of Ownership).

|  |  |  |  |
| --- | --- | --- | --- |
| Renovation roadmap | BAU-scenario (EXX) | E90 | E60 |
|  |  |  |  |
| Total cost of investment |  |  |  |
| Yearly energy reduction  |  |  |  |
| Total cost of ownership (20 years) |  |  |  |
| Property value |  |  |  |

## Preparation and follow-up until roll-out

Next, the extra costs of the works needed for the implementation of the measures are listed for each scenario (BAU-E60-E90).This list contains all necessary costs apart from the actual cost of investment (material and installation) of the individual measures until the date of completion.

### Design of the final draft

* Digital measurement of the building and detailed design of the draft.
* Meeting with the involved administration: planning department, fire department, building aesthetics committee…

### Additional research

Additional surveys are needed to comply with the regulations or for further research for implementation one of the measures. e.g. (non-exhaustive)

* EPB-Survey
* Stability-analysis
* …

### Draw-up tender documents:

* Draw-up technical file and administrative specifications, detailed measurement data, summarising measurement data (application form) for the chosen roadmap
* Design implementation plans per phase
* Design implementation planning per phase

### Tender (after approval of planning permissions)

* Request for quotes
* Comparison of prices and negotiation of the tender
* Advice about commitment with the contractor

### Audit of the implementation

* Project-and quality management during execution
	+ Technical inspection of the work
	+ Inspection and follow-up of the implementation of the planning
	+ Management of the weakly work meting (technical, cost-technical, organisational)
	+ Reporting
* Delivery
	+ Assistance with the provisional and final delivery
	+ Initial delivery of the technical installations
* EPB-reporting
* Safety coordination

This results in an overview of the total costs until the delivery of the several scenarios (BAU-E90-E60).

Special attention is paid to the difference between the TCO (20 years) between the energetic scenarios and the BAU scenario.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Renovation roadmap** | **Cost of investment** **(€)** | **Extra audit** **(€)** | **Preliminary draft****(€)** | **Tender documents (€)** | **Tender****(€)** | **Inspection of implementation (€)** |
|  |  |  |  |  |  |  |
| Cost per measure |  |  |  |  |  |  |
| Total cost of the scenario |  |  |
| Difference TCO in relation to BAU-scenario (20 years) |  |  |
| Added value property |  |  |

## Presentation of the results of the Master plan audit

The results of the Master plan audit are reported to:

* the project team of the contractor|Renovationcoach EcoHuis |Trustee
* Co-owners and trustee

|  |
| --- |
| **This presentation contains at least:*** A presentation (ppt) for the co-owners:
	+ Analysis of the building quality/physics
	+ Design of the renovation roadmap scenarios (BAU-E90 –E60)
	+ Preparation until implementation
* A summary for non-experts (10 pages)
* Extensive report of the Master plan audit for experts
 |

# Financing options and subsidies

This chapter explains how the Renovation Coach| City of Antwerp will calculate the financing options and subsidies for the different renovation roadmaps based upon the output of the results of the Master plan survey (Chapter 5)

Subsidies will vary strongly depending on:

* the achieved E-level
* the combination of different individual measures into an integrated renovation roadmap in the short run.

This information is presented clearly when presenting the Master plan audit (Chapter 5.5).

|  |
| --- |
| **Presentation of financing options and subsidies:*** Existing financing options offered by various financial institutions (Co-owner loans for renovation of buildings)
* Existing alternative business models for the implementation of the (one or more) proposed measures: energy supply contracting, energy performance contracting, offer of energy cooperations etc.
* Subsidies
	+ Impact of short term integrated renovation or long term renovation planning over consecutive years.
	+ Federal and Flemish subsidies
	+ Additional subsidies of the City of Antwerp
	+ Subsidies issued by the Distribution System Operators
 |



Overview of possible subsidies per scenario (BAU-E60-E90) : minimum and maximum per share of co-ownership

# Planning Master plan audit

The schedule below shows the strict planning of the survey. As the start and end date of the Master plan is agreed upon with the General meeting of the co-owners and the Trustee, it is extremely important to respect the planning.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Roadmap**  | **Step** | **Main task** | **Timeline** | **Deadline** |
| **Master plan audit** | **Diagnosis current status building** | Start meeting  | General meeting co-owners|Trustee | **dd/mm/yyyy** |
| Site visit and global audit |  |  |
| Analysis |  |  |
| Reporting |  |  |
| **Design of the renovation roadmaps** | Design BAU-scenario |  |  |
| Design scenario E90 – E60 |  |  |
| Reporting |  |  |
| **Preparing Roll-out** | Cost estimation for total roll-out of the scenarios |  |  |
| Financing schemes and funding opportunities | \*\* input needed from following step for further development |  |
| **Conclusion** | Presentation of the conclusion | Project Steering Group Client | **min. 1 month before end date** |
| General meeting co-owners|Trustee | **dd/mm/yyyy** |

# Specification for quotation

## Submission

The quotation needs to be submitted at the latest on dd/mm/yyyy. Each person mentioned below should receive 1 hardcopy and 1 digital copy of the quotation.

|  |  |  |  |
| --- | --- | --- | --- |
|  | Co-ownersChairman | Trustee | Renovation coachCity of Antwerp |
| Contact person |  |  |  |
| Phone number |  |  |  |
| E-mail |  |  |  |
| Address |  |  |  |

* For any additional information about the content of the specifications, the following person can be contacted:

Name contact person:

## Contractor requirements

### Company or consortium

* Please specify the main contractor
* In case of a consortium between different companies, please give an overview of the main contractor and the subcontractors and specify their tasks.
* Administration and invoicing will be done by the main contractor.

### Required expertise

Expert knowledge about the following subjects (applied to residential units and condominiums) is needed.

* Housing quality
* Building physics|Design
* Building techniques (HVAC|SWW|utilities)
* Energy Performance (EPB standards)|(Fire)Safety

### Credentials

Please specify at least 3 credentials per category for studies implemented on condominiums in the last 3 years. The credentials per theme can be for the same project.

|  |
| --- |
| For each of the credentials we ask the following data:* Client and contact details of the constructor
* Address
* Task in project team (main contractor, subcontractor
* Description of the activities: study-design-implementation for new build and/or renovation
* Start and end date of the project (or status of the project at this moment)
 |

## Project team members

* The quotation will specify which member of the project team will be involved in this assignment.
* We need the name, function and qualifications of the expert and his/her substitute.
* A project coordinator will be designated and his/her contact details will be communicated. The project coordinator can be contacted for more information about the quotation.

## Minimal content of the quotation

In the quotation, a short explanation of each process stage will be given. When submitting a quotation for this assignment, the submitter commits to execute the study according to the technical specifications clarifies in chapter 5.

## Requested price specification

### Honorarium

The honorarium for the work described in this study is listed in the pricing table below with a detail of:

* Price per sub-activity
* Amount of man-days per sub-activity
* Company and team member that will work on this sub-activity of the study

The quotation fort his study is fixed, additional costs cannot be charged unless extra research is needed. (Chapter 5.1.1). For this extra research, arrangements will be made beforehand with the customer and a separate contract will be signed before the execution of this extra work. The quotation should also mention the price per hour that will be used for possible extra work per hour.

In case there are any foreseen activities in the study that are not mentioned in chapter 5, please list these in a separate price list.

### Price adjustment

The prices should be valid for 3 months starting from the date of the quotation.

### Invoice

The invoice for the Master plan audit can be made up after the handover to the project team.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Master plan audit** | **Step** | **Main tasks** | **Man-days****(# days)** | **Price(€)****Excl VAT** | **Team|Company** |
| **Diagnosis current status of the building** | Start meeting  |  |  |  |
| Site visit and audit |  |  |  |
| Analysis |  |  |  |
| Reporting |  |  |  |
| **Design of the** **renovation roadmaps** | Design BAU-scenario |  |  |  |
| Design scenario E90 – E60 |  |  |  |
| Reporting |  |  |  |
| **Preparation roll-out** | Cost estimation for total roll-out of the scenarios |  |  |  |
| Financing schemes and funding opportunities |  |  |  |
| **Conclusion** | Presentation of conclusions of the Master plan audit |  |  |  |
| **Total Price (€) (excl. VAT)** |  |
| **Total Price (€) (incl. BTW)** |  |

# Annex 1: Master file building

# Annex 2: Results of the residents survey of needs

# Annex 3: Framework for the analysis of the current state of the building