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## **D5.3 – Business models for district level refurbishment**

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## History

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## 1 Introduction

### 1.1 Publishable summary

The aim of the work was to find scalable and repeatable business models for refurbishment projects with multiple owners and stakeholders. New innovative tools and processes are essential parts of the business models. Business models for district level refurbishment including step-by-step process, several building owners, local distributed renewable energy system procurement, renewable energy production and resource sharing and operation, enabling financing of large scale refurbishments by smart step-by-step approach

A district level refurbishment includes always several stakeholder groups. Therefore, also business models for various delivery processes such as Alliance Refurbishment, Primary Project, Distributed Design-Build, and Public/Private-Private-partnership were developed.

Service design is an activity to plan and create a new service or plan and re-organise an existing service. The methodology of service design aims at establishing best practices for designing services according to both the needs of customers and the competencies and capabilities of service providers. Business model canvas approach was used to describe the models. The verification of the business models bases on measuring the business models connected to services against the market and targeted customer groups.

Market views to the business models were collected with interviews with municipalities, energy companies, contractors, consultants and housing managers.

### 1.2 Purpose and target group

Business models for district level refurbishment base on collaborative project delivery methods. The aim of Task 5.3 is to find scalable and repeatable business models for refurbishment projects with multiple owners and stakeholders. The results are utilised in different types of projects such as refurbishment project with several building owners, local distributed renewable energy system procurement, renewable energy production and resource sharing and operation, enabling financing of large scale refurbishments by smart step-by-step approach and the energy management of buildings. The group for the outcome includes building owners, energy managers and financiers. Business models are assessed with a view to project delivery methods.

### 1.3 Contribution of partners

The targets and scope of the work in the Task 5.3 was discussed in project meetings, and the outcome was commented by the consortium. Connection to Task 5.4 was assured through discussions with respective Task leader. The deliverable was prepared by Sweco. VTT was responsible for interviews with different stakeholder groups.

### 1.4 Relation to other tasks/deliverables

The work bases on Deliverables 4.2 and 5.2. The work supports the development of business models in the Task 5.4 and testing of process models in WP6.

### 1.5 Terminology and definitions

AI Artificial Intelligence

AR Augmented Reality  
BAMB Buildings As Material Banks  
BIM Building Information Model  
CBA Cost Benefit Assessment  
CSR Corporate Social Responsibility  
CIM City Information Model  
DB Design Build  
EBITA Earnings before investments, taxes and amortisation  
EMS Energy Management System  
GHG Green House Gas  
ICT Information and Communication Technologies  
IoE Internet of Everything  
LCA Life Cycle Assessment  
LCC Life Cycle Cost  
LT Low Temperature heat  
MR Mixed Reality  
PPO Primary Project Owner  
PPP Public/Private Private Partnership  
RES Renewable Energy System  
SPV Special Purpose Vehicle  
VR Virtual Reality

## **2 Business possibilities for different stakeholder groups**

Development of the built environment requires both demand by the users and owners of buildings, infrastructures and facilities, and service providers' services to fulfil the demand. Energy production and energy efficiency are key the services in mitigation of greenhouse gas emissions (GHG).

Business innovation requires to look at the nature of the services an enterprise offers, revenue models and enterprise's role in the value chain. For the built environment, GHG mitigation requires adopting new approaches for services, redefining existing services or creating entirely new ones.

Generating revenue through re-configuration of the offering leads to new service products, novel services and business and value based pricing models. Developing the networks with employees, suppliers and customers provide opportunities for re-defining one's role in the value chain [BAMB, 2017]. This process can offer new business possibilities for new and existing service providers.

### **2.1 Stakeholder groups in district level refurbishment**

The decision making on refurbishment and district level energy possibilities will need several stakeholders to be involved. The willingness of owners and users to collaborate in searching new opportunities at district level is required. Energy management companies and solution and service providers need to participate in early phases of refurbishment projects. The residents are in a key role in a typical district with mix of uses.

The customer groups are segmented into five groups, Table 1. The table shows expectations that different stakeholder groups may have for improvements in their living or operation area. The expectations also reflect directly the motivation to district development. A district level development will concern all the stakeholder groups in the district.

Basically, the first contact or initiator of a district level project can come from any of the groups. In cases where housing forms the major part of the district buildings, an activator may have an important

role in the development, or in case of a business district an active business or property owner can activate other stakeholders.

The contact point in the beginning of a district level refurbishment or renewal will most likely be the municipality. Local authorities together with activators, committed companies or individuals can help to consolidate interests of all other stakeholder groups. But as soon as all the stakeholder groups or the groups that the district refurbishment concerns can agree on desired outcome of refurbishment the project will grow significance.

Digitalisation and ICT will enable new services that can offer added value to building owners and end-users. New renewable energy providers or services providers for different inhabitant groups such as the elderly can benefit of this development. Digitalisation and ICT will also make the participation in the development and decision-making easier.

Stakeholders can have very different views to both benefits and drawbacks of a district level refurbishment. A significant drawback would be that a district refurbishment will increase the value of the properties but – if total living costs (i.e. rent plus energy costs) rise too much – the refurbishment can at the same time increase segregation and gentrification. Segregation typically impacts the most vulnerable groups of people.

Table 1. Stakeholder groups and their expectations to district level refurbishment [Moder, 2017]

Local authorities Municipality District council	Private building owners Commercial building owners	Local businesses	Finance Investors	District residents Other users Local interest
Brand, attractiveness to new people and business Satisfied users, owners and business actors Cost efficient and reliable infrastructure: Energy, water, waste, waste water management, ICT-infrastructure, transportation, etc. Low emission /energy neighbourhood Political interests Best practice LCC of properties Improvement of social and technical quality of problem districts New financing possibilities	Business potential Low energy and maintenance cost Satisfied building users Predictable, stable business environment Profitability Attractiveness and urban comfort Indoor and outdoor air quality Safe environment Property value development Brand, attractiveness of the district	Business potential Management costs Profitability Value development Reference projects Portfolio diversification Green brand, sustainability policy Long-term facility users Cost efficient and reliable infrastructure: Energy, water, waste, waste water management, ICT-infrastructure, transportation, etc. Incentives and funding availability Accessibility for businesses	Predictable environment Growth potential Attractiveness to new people and business Brand, attractiveness to new people and business Profitability Reliable infrastructure: Energy, water, waste, waste water management, ICT-infrastructure, transportation, etc. Long-term value development Availability of national targets Policies and strategies Low risk Tax incentives	Unpolluted fresh air Safe environment Lively neighbourhood Comfortable environment Attractiveness: Education and social services Reliable infrastructure: electricity, heat, cool, and water and waste management, ICT-infrastructure, transportation, safe walking and cycling conditions Green, low emission neighbourhood Good reputation of district / improvement of the social status Value development

The role of energy companies may become crucial in supplying renewable energy into electricity grid or district heating and cooling networks. The European legislation oblige the companies to allow the feed of locally produced energy to the delivery grids and networks.

## 2.2 Business possibilities

A stakeholder views map is shown in Appendix 1. It describes phenomena based forecasting of the future trends for different stakeholder groups. The trends are the basis for business possibilities. The prioritized trends based on Moder objectives were recognised for the basis of business concepts for five selected Moder stakeholder groups. Sustainable business possibilities and scalability for the stakeholder groups are in the Figure 1 and Appendix 2.

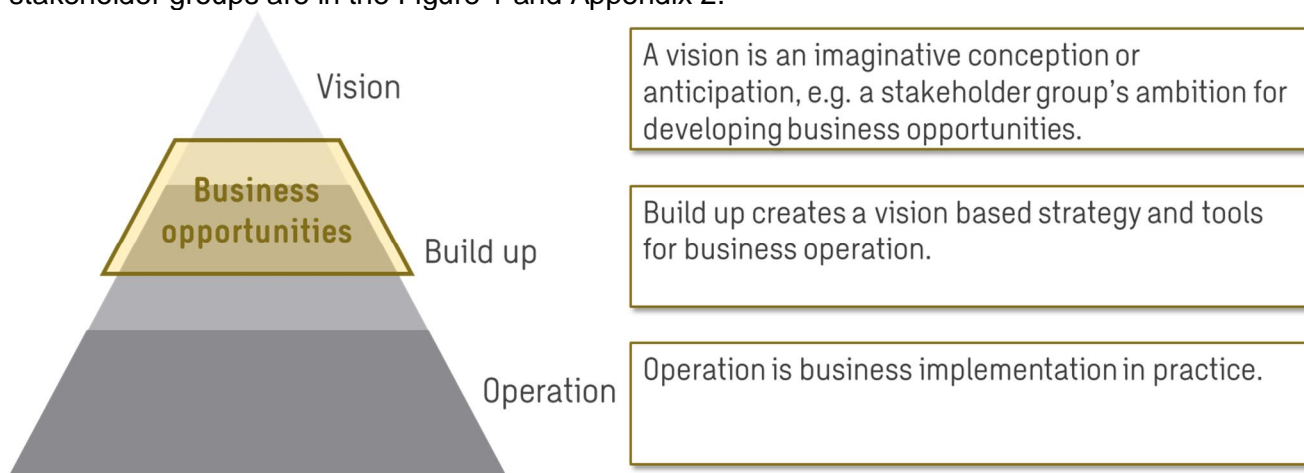


Fig. 1 Example of business scalability pyramid.

Local authorities do not typically act as a developing party in district level refurbishment, although they often will take the initiative to start the process and bring together all stakeholders. For the development of a refurbishment plan and the implementation of such a plan, they need an external player to be an orchestrator of district level refurbishment process. The service provider that takes this role can be a private and independent trusted expert organisation. The business goal is to build up trust among the stakeholders and to develop a viable refurbishment plan.

Private and commercial building Owners seek for better performance and higher property value and long-term security of their investment. Private house owners are more focussed on improved comfort, acceptable living costs and – to a lesser extent – property value.

The service provider can be, e.g. an energy consultant with supporting partners such as local authority, energy company or a contractor. The customers include real estate and dwelling owners and investors.

Local businesses can utilise their local energy system. In this case, service providers are technology and maintenance service providers, energy company and local grid operator. Key customers are different types of local businesses, residents, real estate owners, utility companies, industry.

Finance enables or supports district level projects. The service provider are investors. The customers are district level project developers. Moder serves methodology and key performance indicators for successful district level project.

Residents needs are comfort, beauty and safety with affordable costs. The service providers are consultants, construction industry and renewable energy system providers. Key customers are housing associations, insurance companies, leaseholder companies, home owners and tenants.

### 3 Service design for district level refurbishment

#### 3.1 Introduction to service design

Refurbishment at district level is basically a combination of different services. Service design is an activity to plan and create a new service or plan and re-organise an existing service. In both cases the aim is in infrastructure, communication and components of a service to verify or improve its quality and the interaction between the service provider and customers. The organisation and people are in the focal point of the service design. District level projects may become very complicated from the customer and user perspective. Therefore, the customer and user experiences are essential.

The purpose of service design methodologies is to establish best practices for designing services according to both the needs of customers and the competencies and capabilities of service providers. If a successful method of service design is employed, the service will be user-friendly and relevant to the customers, while being sustainable and competitive for the service provider.

The general principles of service design are to focus the designer's attention on generic requirements of all services. They are complemented by quality assurance and performance guarantees as a part of the service model that relate to process design, organizational design, information design and technology design.

Service design is a process in which the designer focuses on creating optimal service experiences. This requires taking a holistic view of all the related actors and their interactions, and supporting materials and infrastructures. Service design often involves the use of customer journey maps, which tell the story of different customers' interactions with a brand, thus offering deep insights.

Five basic principles that underlie service design [Interaction Design Foundation, 2017]:

1. User-centred, through understanding the user by doing qualitative research
2. Co-creative, by involving all relevant stakeholders in the design process
3. Sequencing, by partitioning a complex service into separate processes
4. Evidencing, by visualizing service experiences and making them tangible
5. Holistic, by considering touchpoints in a network of interactions and users

Successful execution of the services requires business models. The business models connected to services should be measured against the market and targeted customer groups. The verification of business models for services offered for refurbishment at district level follows the steps below:

#### 1. **Market understanding & unique insight**

-> We understand the market and its future development (better than the competition). We understand the customers, their buying process and criteria, and what are the dimensions of competition (price, brand, performance, service, customer intimacy...). Market is segmented into meaningful distinct segments based on our unique market insight.

#### 2. **Selected target segment / customers**

-> We have identified our target segment and customers. The target groups are so specifically defined that we can target our actions.

#### 3. **Understanding of the competitive landscape**

-> We understand the competing companies' strategies and their market approach. We



understand the competing companies/offerings in the market and how these compare to our products. We know the price level.

4. **Product & services defined**  
-> What are the products and services we offer in this segment. Are we actually offering design, solution or new business model? What are the specific features needed.
5. **Value proposition defined**  
-> What is the value we can offer to the customer and relevant stakeholders in the value chain? How does this differ from the alternative solutions (direct or indirect competition)? Is this based on low cost, service leadership or customer intimacy? Value quantified?
6. **Customer relationship & channels defined**  
-> We have defined the customer relationship and the channels we use to reach the customer in awareness (how the customer becomes aware of our solutions), evaluation (how we help the customer to compare), delivery and aftersales
7. **Way of working & organisation defined**  
-> What are the key activities to enable us to sell and deliver. Key suppliers and other partners? Key resources and assets? Essential parts of own organisation and extended organisation?
8. **Identified synergy with other businesses**  
-> How does this business link to out other businesses and activities? What is the anchor point that makes us successful in this business?
9. **Sustainable competitive edge**  
-> What is our competitive edge compared to the competition in the market (cost advantage, product leadership, customer intimacy, ...). Do we have a position in the value chain so that we can capture the value? Why is this sustainable (e.g. barriers of entry ...)?
10. **Confirmed business case (profitability)**  
-> The cost structure related to serving the market delivers profit? Expected revenue stream and our cost structure are analysed to that the expected margin and EBITA are acceptable (per project and as a total)? How do alternative future revenue scenarios affect the profitability (sensitivity, risks)?
11. **High commitment decisions made & conviction to act**  
-> Real strategic decision have been made and balance between commitment and flexibility.  
-> Convinced personal decision making & buy-in in the relevant parts of the organisation.
12. **Action plan and resources in place**  
-> Needed actions (including re-allocation of people, money and management time) are identified and responsibilities are clear.  
-> Needed resources are in place with sufficient mandate.

These steps aim at adding value to end users. At the same time steps enable sustainable business in district refurbishment.

### 3.2 Business Models for services

A business model describes the rationale and process of how an organisation creates, delivers and captures value of its operations. A business model canvas [Osterwalder & Pigneur, 2010], Fig. 2, is a management tool and template for developing new or documenting existing business models. The Business Model Canvas is a business tool used to visualise all the building blocks of starting a business, including customers, route to market, value proposition and finance.

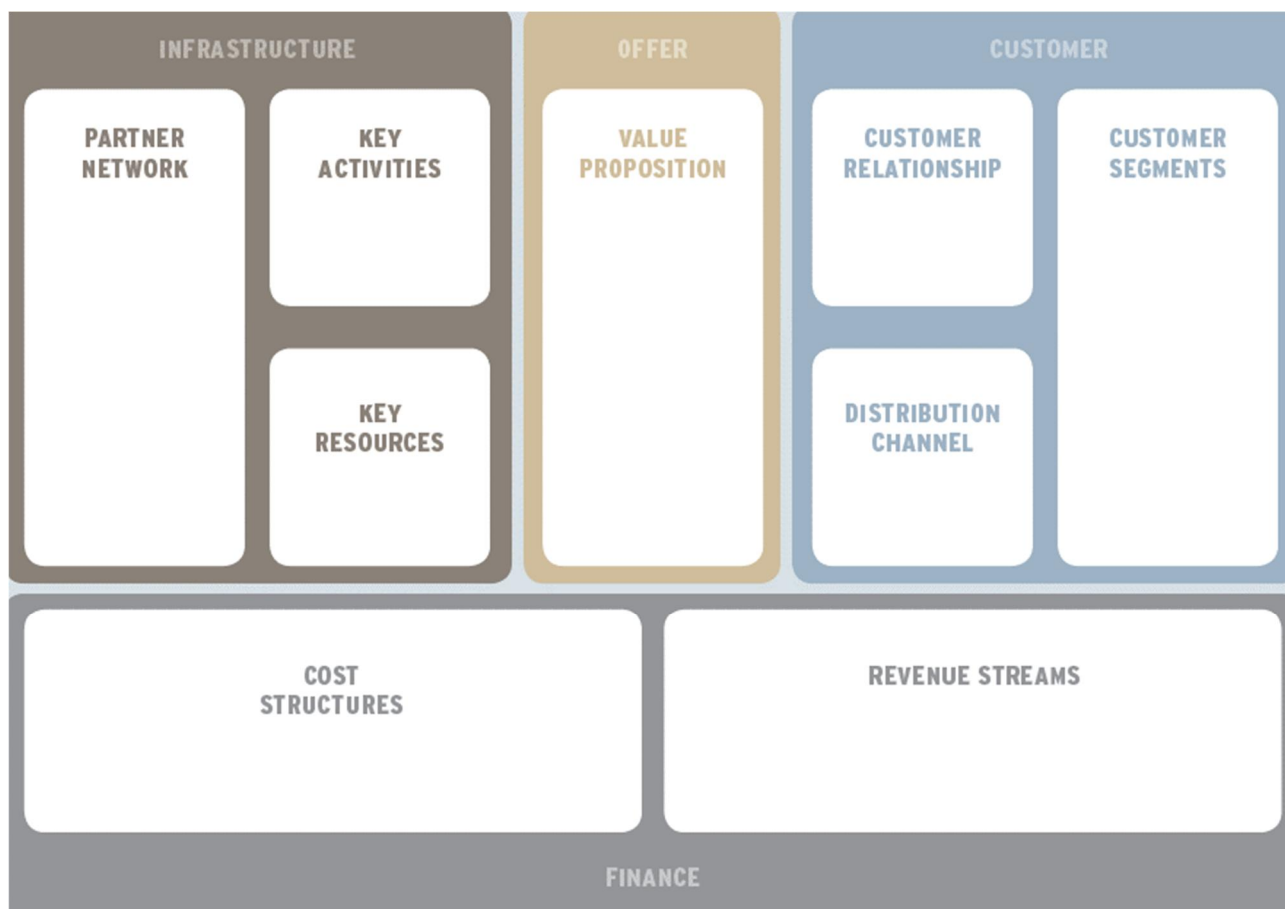


Figure 2. Business model canvas and its visualisation [Forth Innovation Method]

Social, areal and environmental consequences can be presented also as separate boxes, e.g. below the financial factors. These consequences are included into the above presented canvas fields. The four areas of the canvas are business infrastructure, customers, offer and finance.

### Infrastructure

**Key Activities:** The most important activities in executing a company's value proposition. Key activities can be categorized: production, problem solving and platform/network. An example for Bic, the pen manufacturer, would be creating an efficient supply chain to drive down costs.

**Key Resources:** The resources that are necessary to create value for the customer. They are considered an asset to a company, which are needed to sustain and support the business. These resources could be human, financial, physical and intellectual.

**Partner Network:** To optimise operations and reduce risks of a business model, organization usually cultivate buyer-supplier relationships so they can focus on their core activity. Complementary business alliances also can be considered through joint ventures, strategic alliances between competitors or non-competitors. Different motivations can be distinguished to create partnerships: optimization and economy of scale, reduction of risk and uncertainty and acquisition of particular resources and activities.

### Offer

**Value Propositions:** The collection of products and services a business offers to meet the needs of its customers. A company's value proposition is what distinguishes itself from its competitors. The value proposition provides value through various elements such as newness, performance, customization, design, brand/status, price, cost reduction, risk reduction, accessibility, and convenience/usability. The value propositions may be quantitative (price and efficiency) or qualitative (overall customer experience and outcome).

### Customers

**Customer Segments:** To build an effective business model, a company must identify which customers it tries to serve. Various sets of customers can be segmented based on the different needs and attributes to ensure appropriate implementation of corporate strategy meets the characteristics of selected group of clients. The different types of customer segments include:

- **Niche Market:** Customer segmentation based on specialized needs and characteristics of its clients.
- **Segmented:** A company applies additional segmentation within existing customer segment. In the segmented situation, the business may further distinguish its clients based on ownership, building types or applied energy systems.
- **Diversify:** A business serves multiple customer segments with different needs and characteristics.

**Distribution channels:** A company can deliver its value proposition to its targeted customers through different channels. Effective channels will distribute a company's value proposition in ways that are fast, efficient and cost effective. An organization can reach its clients either through its own channels (store front), partner channels (major distributors), or a combination of both.

**Customer Relationships:** To ensure the survival and success of any businesses, companies must identify the type of relationship they want to create with their customer segments. Various forms of customer relationships include: personal assistance, dedicated personal assistance, self-service, automated services, communities and co-creation.

**Personal Assistance:** Assistance in a form of employee-customer interaction. Such assistance is performed either during sales, after sales, and/or both.

**Dedicated Personal Assistance:** The most intimate and hands on personal assistance where a sales representative is assigned to handle all the needs and questions of a special set of clients.

**Self Service:** The type of relationship that translates from the indirect interaction between the company and the clients. Here, an organization provides the tools needed for the customers to serve themselves easily and effectively.

**Automated Services:** A system similar to self-service but more personalized as it has the ability to identify individual customers and his/her preferences. An example of this would be Amazon.com making book suggestion based on the characteristics of the previous book purchased.

**Communities:** Creating a community allows for a direct interaction among different clients and the company. The community platform produces a scenario where knowledge can be shared and problems are solved between different clients.

**Co-creation:** A personal relationship is created through the customer's direct input in the final outcome of the company's products/services.

## Finances

Business canvas includes two major economic topics: cost structure and revenue streams. Cost structure describes the most important monetary consequences while operating under different business models. Cost-driven business model focuses on minimizing all costs and having no frills. Value-driven business model is less concerned with cost but focuses on creating value for their products and services. Cost structures can have the following characteristics: fixed costs, variable costs, economies of scale and economies of scope.

Revenue streams describes the way a company makes income from each customer segment. Ways to generate a revenue streams are: asset sale, usage fee, subscription fees, lending/renting/leasing, licensing, brokerage fees and advertising:

- Asset sale (the most common type) or selling ownership rights to a physical good.
- In usage fee, the more a service is used, the more the customer pays. A district level web service could be developed based on usage fee revenue stream.
- Subscription fees provide users access to services based on monthly or yearly services.
- Lending/renting/leasing grants the client the exclusive right to use a fixed period of time in return for a fee. Building owners don't need to own all equipment in their buildings if they prefer to rent those or related services in given time.
- Licensing gives customers rights to use protected intellectual property in exchange for licensing fees. MODER results could be trademarked and patented, after which it could be licensed to software companies.
- Brokerage fees can be used e.g. by district level Activators when they perform intermediation services on behalf of several parties.
- Advertising revenue stream results from fees from advertising a product, service or brand.

Each revenue stream may have different pricing mechanisms. The type of pricing mechanisms chosen can make a big difference in terms of revenues generated. There are two main types of pricing mechanisms: fixed and dynamic pricing.

Fixed menu pricing consists of predefined prices based on static variables: list price, product feature dependent, customer segment dependent and volume dependent prices. In dynamic pricing, prices change based on market conditions.

### 3.3 Market input to business models

MODER carried out 20 interviews in Finland with the aim to collect and analyse expert views on Refurbishment at district level All interviewees were experts with a good expertise and experience in urban renewal projects, urban infill projects, district level refurbishment projects and group construction. The market view to refurbishment at district level [Häkkinen, T., Mäkeläinen, T., Ala-Juusela, M. 2018] includes interviews with five expert groups were interviewed:

- Cities (urban planning, climate strategies)
- Energy companies
- Contractors
- Consultants (bigger and smaller consultancies)
- House managers

Although the number of interviews is limited, the outcome shows that a district level project requires in many cases an activator for the development of basic vague ideas into a project.

## Municipalities

The interest of municipalities in district level refurbishment is closely linked to the climate targets. District level refurbishment considered as a potential sector as it supports the climate targets of municipalities. Urban renewal projects that focus on selected suburbs are important. However; the possibilities to steer the private sector in district level refurbishment by the municipality are rather low. Although the municipalities may have a possibility to offer incentives for refurbishment such as permissions for energy efficient infill construction, financing instruments on national level are needed.

Municipalities offer City Information Models for the use of designers. This can contribute to the motivation and specifically design phase with accurate information on the buildings and energy systems. Now, the models include only buildings. The municipalities can thus also take the role of an activator in the early phase of a district level refurbishment project.

### Energy companies

The energy company should be involved from the very beginning in district level refurbishment. This would enable more opportunities for finding optimal energy solutions in the district. The role of the municipality may be important where the municipality is the owner or partial owner of the energy company. Thus, the city strategy impacts on the activities of the company.

The role of energy companies is changing. In the future, they may become service providers who – for example - sell indoor environment condition instead of energy. The service provider needs to be able to work together with very different kinds of actors (with different background, competencies, interests, understanding etc.). Therefore, digital platforms that enable the collaborative participation are important to support district level refurbishment.

District level refurbishment is an important tool to improve the image and attractiveness of the district. It is important that there is one actor who manages the whole picture and provides continuity for the process.

Different kinds of activator models are needed – as the process proceeds the challenges and complexity increase.

### Contractors

Successful district level refurbishment requires holistic view and understanding of realistic potentials. Reliability and realism are important issues – the occupants (as customers) should be able to trust the analyses and information given by the service provider. For example, providers of specific energy systems may have too narrow viewpoint.

Municipalities have an important role in the beginning of the process by providing demonstrations and also by giving some financial support. The role of a municipality could also be important in the establishment of collaboration platforms and enabling the participation of occupants and service providers.

Municipalities have a very important role in urban planning that enables district level solutions instead of inhibiting them. This includes for example issues of parking places, energy solutions and infill construction.

Infill construction provides significant financial potentials only when the volume is big and only in growing urban districts. Otherwise, expectations are often too high.

Group refurbishment, e.g., Primary Project Model [Moder b 2017] is more beneficial than refurbishment on building level if competitive procurement is well organised. The most potential

districts are those that have similar kinds of buildings, built in the same decade. It is easier to start in urban residential districts where flat prices are high. It is easier to start with big owners of rental buildings (public or private).

An activator is absolutely needed. There must be somebody who understands the case and is able to engage with the occupants and owners. Different kinds of activator models should be tested and demonstrated.

### Consultants

The role and participation of the municipality is very important in terms of informative support about beneficial low-energy concepts on district level. The activator could even be hired by the municipality. The involvement of the municipality is also important to ensure the neutrality of the process. Activator's competences in risk management and contracting - especially in alliances - is very important.

There are very different kinds of urban districts; thus, also different kinds of plans, solutions and steering methods are needed. New kind of steering methods, collaboration models and platforms that enable the participation of people are very important.

People need alternative attractive potential solutions. Service providers need to develop and offer conceptualised solutions to make it simple for the final customer (owner occupant) and enable easier decision making. There should be different types of incentives to support district level co-refurbishment with energy focus.

Group construction requires often a very long-term preparation work. It would be important to have the same service provider throughout the project to ensure continuity. It may be difficult to achieve commitments from a big group. Important value propositions include quick estimates of the potential of the district, competitive financing, possibly based on infill construction, and comfortable living environment.

### Housing managers

The role of housing managers is transforming towards asset management. Therefore, no new actors are needed, and the role of an activator is very natural for housing managers. All local actors should be activated (housing managers and neighbourhood associations, business associations, service providers, retail organisations). Municipalities could prepare potentiality maps. Municipalities should be more proactive

Facility level programming of refurbishment is not wise if the district consists of similar buildings. A district level well-managed programming saves time and money. The support by the municipality is important. Municipality should be a part of the process but the municipality is not an actor in district level refurbishment. Urban infill construction can serve as a driver and thus urban planning should be flexible.

Energy aspect is always imbedded in refurbishment projects. The roles in a district level project should be clear. The development of urban residential districts is not a responsibility of an energy company.

A housing company may be challenging customer due to country specific and different decision-making models [Moder, 2016]. Clear argumentation on the benefits, presentations and good reasoning are needed and addressed to laymen, and reasonable renovation concepts with many concrete examples. The refurbishment is easier with a professional owner.

### 3.4 Development themes influencing in emission mitigation

The following sections describe shortly concepts that can be found relevant when developing novel sustainable business models for district level refurbishment. Ecological footprint measures human impact on nature by the quantity of nature it takes to support people or an economy whereas sustainable handprint describes the positive contribution to all dimensions of sustainability. Net positive approach is a new way of doing business which puts back more into society, the environment and the global economy than it takes out. In a circular economy, the value of products and materials is maintained for as long as possible. Waste and resource use are minimised, and when a product reaches the end of its life, it is used again to create further value.

Applying these concepts for the refurbishment of buildings at district level requires development of new business models and tools for engineering companies, energy managers, consultants and other actors. It supports municipalities and building owners at to look at cost-effective, energy-efficient and user-oriented refurbishment of buildings as part of the global energy system.

#### 3.4.1 Sustainable Handprint

Sustainable handprint describes positive action, commitment and measurement towards sustainability. It is directed to decrease the human footprint and make the world more sustainable. While the footprint is a measure of human pressure on earth's resources, the handprint is a measure of what we can do individually, and together, to restore the balance between consumption and the planet's carrying capacity.

Handprint stands for

- positive & tangible action and projects towards sustainability
- a tool to calculate the extent of action being taken and the positive impact of our actions on sustainable development
- a symbol of commitment through a pledge to act
- a caring attitude extending a helping hand in caring for the planet and all life on it
- networking and collaboration joining hands for the common goal of sustainability on earth, the only known living planet. [Handprint.in, 2007; NAAEE, 2017]

Key indicators for the design of refurbishment at district level to support target setting, monitoring and decision making in design. This included social indicators in addition to cost, energy and environmental ones. Furthermore, process aspects, such management, participation, disturbance and replicability were introduced. Applying sustainable handprint for the district level refurbishment of buildings at district level requires measuring not only improvements in energy, environment and cost impacts but also influence in social and process effect. The state and progress should be communicated to the stakeholders while looking at the positive influence as discussed more in detail in the following section.

#### 3.4.2 Net positive approach

The net positive concept means active good making in the whole value chain and surrounding society instead of only minimizing the harmful impacts. Since this way of thinking is novel in companies, group of enterprises and organizations have agreed on some guiding principles for its fundamentals. This section lists 10 principles based on these ideas that are seen relevant in the MODER environment. [Forum for the Future, 2013; Tynkkynen et al., 2017] brokerage:

- The first principle is to aim to make a positive impact in all key responsibility areas. It is gracious since the organization can define which are essential areas for its activity and

focus on improving those. The five responsibility areas often referred to are climate, water, social responsibility, natural resources and biodiversity.

- The second principle means following good practices in all social, ecological and economic sustainability fields. In addition to improvements in key areas, the operations must be of high quality all along the line.
- The third principle says the positive impacts must be measurable or at least clearly justified. It cannot base solely on company's own stocktaking. For plausibility, concrete examples should be reported e.g. demonstrating the social impacts.
- The fourth principle relates with investments in innovation in products and services, entering new markets, works across the value chain, and in some cases, challenges the very business model it relies on. The product development does not need to take place only in one organization. The municipality or building owner can support development amongst the suppliers e.g. through placing prominent orders on renewable energy systems.
- The fifth principle deals with a strong commitment in implementation. It often requires a big shift in approach and outcomes, and cannot be achieved by business-as-usual. As an example, the energy company can develop their services by applying circular economy principles and reducing the need of imported fossil energy by domestic waste and bio based fuels.
- The sixth principle is about transparent reporting on progress. It must be consistent, authentic and independently verified where possible; boundaries and scope are clearly defined and take account of both positive and negative impacts - any trade-offs are explained.
- The seventh principle requires net positive to be delivered in a robust way and no aspect of a net positive approach compensates for unacceptable or irreplaceable natural losses or ill treatment of individuals and communities.
- The eighth principle recognizes that no company can make big changes alone, thus organisations enter into wider partnerships and networks to create bigger positive impacts. Collaboration with organizations sharing the same target and building networks enables achieving meaningful results.
- The ninth principle recommends organisations to publicly engage in influencing policy for positive change. It can mean influencing in removing legislative or administrative barriers for spreading the use of renewable energies in markets where these issues are not well developed yet. Widely though corporate citizenship means that companies are active players developing their sector in the society in addition to running successfully their core business.
- The tenth principle supports an inclusive approach that is adopted at every opportunity; ensuring affected communities are involved in the process of creating positive social and/or environmental impacts. Openness and transparency are corner principles.

To summarize, net positive strategies are built on the idea that a company must give back more than it takes from society and the environment. Becoming net positive requires organisations to be ambitious and plan for long-term success. They should go beyond risk avoidance and incremental improvements and start to innovate. Net positive with other parallel movements such as circular economy drives awareness and engagement developing tools and sharing best practices and guidance. [Forum for the Future, 2013; Tynkkynen et al., 2017]

### 3.4.3 Circular economy

Circular economy can bring major economic benefits, contributing to innovation, growth and job creation. It offers an opportunity to boost our economy, making it more sustainable and competitive in the long run. Action at EU level can drive investment, create a level playing field, and remove obstacles stemming from European legislation or its inadequate enforcement. A circular economy



will preserve resources, some of which are increasingly scarce, subject to mounting environmental pressure or volatile prices, and will save costs for European industries. It will unlock new business opportunities and help build a new generation of European businesses which make and export clean products and services around the globe, and create innovative, more resource efficient ways to provide services or products to customers. It can create local low and high-skilled jobs for our citizens and opportunities for social integration and cohesion. [EC, 2015]

Level(s) is a voluntary reporting framework to improve the sustainability of building providing a common EU approach to the assessment of environmental performance in the built environment towards a circular economy in the buildings sector. To move away from the linear economic model of 'take, make, and waste' and towards resource efficiency, Europe needs a sustainable built environment. That's why the built environment is a key target in the European Commission's policy for circular economy: a regenerative economic system in which resource and energy consumption are minimised. Level(s) is a tool of the circular economy for the built environment. Level(s) encourages life cycle thinking at a whole building level, and supports users all the way from design stage through to operation and occupation of a building. [EC, 2017]

Circular economy is a way in which we make efficient use of the resources that we already have and resources must remain functioning at their highest potential so that they are not consumed, but re-entered into a system that creates value again and again. This economy requires a different way of doing business and hence has different financial needs. The system shift fundamentally changes the role of both the entrepreneur as well as the financier and it requires a different view on risks and returns, the incorporation of intangible capitals (e.g. social and natural capital) into financial decision making and a long-term vision. (Achtenberg, E. & Tilburg, R., 2016)

The built environment offers a huge opportunity for businesses, governments and cities to play a leading role in realising circular economy without having to wait for the transformation of the whole system. Tangible examples that develop in this space can act as a catalyst for a shift in how our cities and urban areas operate in the future. The application of circular economy to the construction industry requires a systems-thinking approach, one which gives an understanding of the whole building lifecycle and the construction value chain, or in other words, understanding the wider context in which development takes place. Only once the value chain is fully understood can the opportunities of the circular economy be realised. [Carra, G. & Magnani, N., 2017]

## **4 Business models for district level refurbishment**

There is a variety of possibilities for business models to carry out a district level refurbishment. The following business models are examples how to create sustainable business in district level project.

### **4.1 Step-by-step refurbishment**

Step-by-step refurbishment is an approach to district level refurbishment where the process proceeds in steps. Every new activity step bases on the success of the previous step, i.e., the potential savings and benefits of a step are analysed for the next step. As a process, this requires more time than other straight forward approaches. The benefits of a step-by-step approach are clear budgeting, possibility for better design and more realistic goals.

The first step includes an analysis of the energy performance and assessment of energy savings through simple and cost-efficient measures. The benefits of the approach become tangible through a careful monitoring of energy performance of a district or a neighbourhood for potential energy savings in the present use. The step-by step assessed savings will then be invested into next steps.

<b>Key partners</b>  Energy auditors, facility managers (service companies)  Architects  Municipality	<b>Key activities</b> 1. Potential energy savings in present use 2. Needs analysis: Renewal and targets 3. Building based energy analysis 4. District level energy goals 5. Strategy for refurbishment  <b>Key resources</b> Energy expert Designer Planner Developer	<b>Value propositions</b>  Environment: Energy savings in present use Renewable energy Improved efficiency  Economy Cost savings Value increase  Social Better indoor climate Positive stimulation Customer satisfaction	<b>Customer relationships</b>  Close to end customers and financiers: Continuous discussion    <b>Channels</b>  Open collaborative platform Face-to-face with stakeholders: stakeholder parliament Social media	<b>Customer segments</b>    Private and institutional building owners  Developers  Energy system producers  Energy companies
<b>Cost structure</b>  Energy analysis Strategy work Planning		<b>Revenue streams</b>  Building owners: Goals and strategy Value promise based pricing, bonuses and sanctions		

Fig 3. Step-by-Step Refurbishment Canvas.

**Market understanding & unique insight:** Activator understands the needs for condition assessment and energy surveys. Unique insight is to develop scenarios for potentials of the district level refurbishment.

**Selected target segment / customers:** Private and institutional building owners, developers, energy system producers, energy companies.

**Understanding of the competitive landscape:** Activator understands the competing companies' strategies, their market approach and pricing mechanisms.

**Product & services defined:** Early phase development of solutions for district level refurbishment, and a concept for implementation.

**Value proposition defined:** District development through environmental efficiency, economic savings, value increase and social improvements.

**Customer relationship & channels defined:** Activator's position in the value chain is being close to end customers which enables continuous discussion with possible financiers. Activator can establish a collaborative platform for information sharing with customers and use social media for interactive communication.

**Way of working & organisation defined:** Activator works closely with known energy experts, designers, planners and developers. Extended organisation includes energy auditors, facility managers (service companies), architects and municipality.

**Identified synergy with other businesses:** Project management and procurement, construction companies specialised in refurbishment, district development including services providers (retail, cafeterias, restaurants, gyms, etc.).

**Sustainable competitive edge:** Early phase total service for project development to capture the value.

**Confirmed business case (profitability):** Management of a company's cost structure, e.g., applying takt-time methodology. Value promise based pricing, bonuses and sanctions for project development.

**High commitment decisions made & conviction to act:** Balance between commitment and flexibility.

**Action plan and resources in place:** Needed resources are in place with sufficient mandate.

## 4.2 A refurbishment project with several building owners

Business models for district level refurbishment project with several building owners bases on process and delivery models such as alliance model, primary project model, distributed design-build model and public/private-private partnership.

### 4.2.1 Alliance refurbishment

Project alliance is a project delivery method based on a multi-party contract between the key players in a project whereby the parties assume joint responsibility for the design and construction of the project to be implemented through a joint organization, which includes the owner or client, and where the players share both positive and negative risks related to the project and observe principles of openness in pursuing close cooperation.

The basic idea is that risk is borne jointly and reward is shared on the basis of the success of the entire project. This makes the parties take each other's views into account and collaborate more efficiently for the benefit of the project. The method also allows combination of a wide range of expertise needed to foster innovation and to make demanding ventures successful. That, again, necessitates early selection of the players and makes offering services at a fixed price impossible. The solution to that challenge is selection based on a thorough review of team performance and capacity [Lahdenperä, P. & Petäjaniemi, P., 2012].

<b>Key partners</b>  Financer Activator Authority Users	<b>Key activities</b>  1. Strategy development 2. Alliance formation 3. Innovation development 4. Implementation 5. Use and operation	<b>Value propositions</b>  Best for the project Nearly zero energy district Return on invest En user advantages	<b>Customer relationships</b>  Operational vision towards customers  Team spirit towards project management group (PMG)	<b>Customer segments</b>  Private and institutional building owners  Energy companies
	<b>Key resources</b>  Alliance management group (AMG) PMG Owner group Design group Contractor group		<b>Channels</b>  Tendering according to competitive dialogue	
<b>Cost structure</b>  Alliance and tendering costs Design development cost Refurbishment costs Operation cost during guarantee costs			<b>Revenue streams</b>  Refurbishment revenue Profit and loss sharing	

Fig 4. Alliance Refurbishment Canvas.

**Market understanding & unique insight:** A large scale district development requires multiple competencies that an alliance can offer. Common goals serve for performance, service, customer satisfaction and finally for sustainable business.

**Selected target segment / customers:** Alliance project delivery suits best for large and complicated projects.

**Understanding of the competitive landscape:** Alliance can benefit from the wide and multiple competencies of the alliance group. Better understanding (several actors) of the market dependencies at the market place can form the competitive edge.

**Product & services defined:** Total delivery of a district level refurbishment including the guarantee period.

**Value proposition defined:** Alliance increases customer satisfaction during the process. Final delivery meets the customer requirements.

**Customer relationship & channels defined:** Operational vision supports customer satisfaction. Interactive collaboration where the team works continuously together, e.g. big room.

**Way of working & organisation defined:** Shared responsibilities, project development in the hands of each stakeholder collectively.

**Identified synergy with other businesses:** Alliance model decreases the financing risks. It may create a core team for engagement of other businesses.

**Sustainable competitive edge:** Alliance can offer sustainable life cycle benefits for large scale projects. The risks are shared with the different stakeholders, and there is a common interest in completing the project successfully.

**Confirmed business case (profitability):** Alliance innovation phase creates a solid base for project delivery. Benefits for heavy management and involvement will pay back when savings and quality increases are higher than time and costs for management and project coordination.

**High commitment decisions made & conviction to act:** Alliance partners form an integrated project team that includes alliance management and operational team.

**Action plan and resources in place:** Alliance innovation phase defines the required resources and funding. Typical characteristics for alliance partners are trust, commitment and cooperation.

#### 4.2.2 Primary project owner

Group refurbishment is a process typically utilised in housing cooperatives' refurbishment of facades and building services. Group refurbishment enables cost savings compared to individual refurbishment projects through lower design and contracting costs, and volume discounts for materials and equipment. At the same time contractor risks are lower and smaller housing corporations can get better services.

The primary project consists of one strong project party, the Primary Project Owner PPO, inviting other stakeholders to take part. The PPO can be, e.g., an owner of an office building or housing cooperation housing, a shopping centre or a hotel. The business model describes how PPO develops the project.

The primary project owner can hire a coordinator for the project. PPO or coordinator initiates and manages the project and represents all the other building owners in communication towards authorities in early project phase. The project can start by strategy development before sending the invitations to other building for fast proceeding of the project. This in turn requires fast decision-making from the invited stakeholders.

<b>Key partners</b>  Project coordinator  Financer  Anchor users	<b>Key activities</b>  1. Strategy development 2. Group refurbishment development 3. Design development 4. Implementation 5. Use and operation	<b>Value propositions</b>  Renewable energy easily and cost efficiently: <ul style="list-style-type: none"> <li>Nearly zero energy district</li> <li>Return on invest</li> <li>End user advantages</li> </ul>	<b>Customer relationships</b>  Primary project owner communicates actively with all building owners	<b>Customer segments</b>  Building owners  Energy companies  Municipality
	<b>Key resources</b>  Designers Contractors Renewable energy system expert		<b>Channels</b>  Tendering according to competitive dialogue	
<b>Cost structure</b>  Design cost Refurbishment cost Renewable energy system cost		<b>Revenue streams</b>  Reduced operation costs Increased property value		

Fig 5. Primary Project Owner Business Model Canvas.

**Market understanding & unique insight:** PPO understands the RES market and benefits for the stakeholders on the long run, and manages the client network and follows new technology and business opportunities.

**Selected target segment / customers:** Recognised customer segments are building owners, energy companies and municipalities, e.g. an owner of an office building, shopping centre or hotel.

**Understanding of the competitive landscape:** Activator must understand the competition at the marketplace.

**Product & services defined:** Activator's new consulting services expand the business possibilities. Design and installation of services can be outsourced. These services can be supplied through partnership network.

**Value proposition:** Renewable energy easily and cost efficiently. Value based procurement.

#### **Customer relationship**

Information sharing: Interactive digital platform and Big room. Face-to-face and provide services with key stakeholders: Creating and maintaining trust.

**Channels:** Awareness raising, information sharing and participatory events. Social media, website, newsletters.

**Way of working & organization defined:** PPO/coordinator manages together with key partners the procurement: competition, price, brand, performance, services and tendering. Anchor user (e.g. key tenant) can be PPO's key partner at the development phase

**Identified synergy with other businesses:** new services are built based on existing businesses.

**Sustainable competitive edge:** cost efficient procurement.

**Confirmed business case (profitability):** Optimized operating costs and incentives from the customer benefit.

**High commitment decisions made & conviction to act:** Strategic commitment will be achieved through service design for the business aiming at flexible refurbishment for defined customer segments.

**Action plan and resources in place:** Needed resources are selected and responsibilities defined. PPO's network provides extended services if needed.

#### 4.2.3 Distributed Design-Build Coordinator

Distributed Design-Build (DB) procurement is coordinated by a steering committee. The steering committee selects a coordinator for daily operations. The business model (Fig. 6) describes how the coordinator manages the process for the steering committee consisting of owners, designer (district level) and cost expert with the decision-making power and supervision capacity. Individual DB projects have their own design teams. There are two cost expert positions: Coordinator's cost expert and individual DB project cost expert.

The aim is to form a common ground for the decision making for different DB projects. Distributed DB model suits best in cases where the market is expected to be able to offer innovative solutions.

<b>Key partners</b>  Contractors Cost expert Supervisor	<b>Key activities</b>  1. Planning 2. Team selection: Designers and contractors 3. Design development 4. Refurbishment 5. Use and operation	<b>Value propositions</b>  End user advantages through best value for money: <ul style="list-style-type: none"> <li>Nearly zero energy district</li> <li>Life cycle cost savings</li> <li>Return on invest</li> <li>End user advantages</li> <li>District value increase</li> </ul>	<b>Customer relationships</b>  Continuous discussion with customers Distributed design build coordinator communicates actively with all design build teams	<b>Customer segments</b>  Building owners Energy companies
	<b>Key resources</b>  Designers Sub-contractors		<b>Channels</b>  Open collaborative platform Tendering according to competitive dialogue	
<b>Cost structure</b> Development costs Cost expert and coordinator's own costs Design build project costs Contracting Supervision		<b>Revenue streams</b>  Basic fee Transformative indirect gains: e.g. reduced operation costs and Increased property value as a basis for bonus		

Fig 6. Distributed Design-Build Coordinator Canvas.

**Market understanding & unique insight:** Distributed DB procurement leaves space for innovation so that suppliers' market knowledge and solutions can be exploited. Life cycle aspects are easy to integrate in contractual models. The coordinator can focus on supervision without the need of investing time in design and scheduling.

**Selected target segment / customers:** The Steering Committee consisting of key partners represent customers expressing the target segment needs.

**Understanding of the competitive landscape:** The process is performance based and best value for money can be procured. The coordinator must judge its own position in the marketplace.

**Product & services defined:** The coordinator defines the desired performance in use. It is important to define the assessment criteria so that the life cycle liabilities are clear.

**Value proposition:** End user advantages through nearly zero energy refurbishment with life cycle cost savings and district value increase. Best value for money.

**Customer relationship:** The coordinator communicates actively with all DB teams to ensure achieving common benefits.

**Channels:** Open collaborative platform and tendering according to competitive dialogue.

**Way of working & organization defined:** Coordinator manages the key partner network, invests in continuous improvement and identifies new business opportunities.

**Identified synergy with other businesses:** Multi-stakeholder approach reaching different customer segments provides opportunities for extending the business to cover other activities.

**Sustainable competitive edge:** Number of coordinated DB contracts enable benefits from the scale of economy. Performance based contracts can be linked with value based remuneration.

**Confirmed business case (profitability):** In addition to DB project costs, coordinator’s revenue streams can come from transformative indirect gains, reduced operation costs and increased property value.

**High commitment decisions made & conviction to act:** Coordinator’s commitment depends on the level communication between coordinator and customers, and keeping the life cycle value promise.

**Action plan and resources in place:** Action plan includes investigation of various funding and pricing models covering the use phase. Liabilities in the supply chain meeting the performance targets must be clearly defined. Cost transfer in multi-contractor environment has to be transparent.

#### 4.2.4 Public/Private-Private Partnership (PPP) Coordinator

PPP model consists of several interest groups with or without a public partner that establishes a company taking the responsibility over the project, Special Purpose Vehicle (SPV). SPV oversees fundraising and finances, technical design and construction time supervision and can act as the energy producing company after the project. In that case the stakeholders become the SPV company’s owners. Figure 7 describes the PPP coordinator’s business model.

<b>Key partners</b>  Designers Contractors Renewable energy system providers Finance e.g. green fund	<b>Key activities</b> 1. Project identification 2. Implementation mechanism 3. Design and refurbishment procurement 4. Refurbishment management 5. Use phase monitoring	<b>Value propositions</b>  Running costs at defined performance level	<b>Customer relationships</b>  Collaborative project	<b>Customer segments</b>  SPV Municipal service buildings Public and private building owners Energy companies
	<b>Key resources</b>  In-house technical and legal services		<b>Channels</b>  PPP competition Collaborative co-operation models (open books)	
<b>Cost structure</b>  Running costs		<b>Revenue streams</b>  Management fee Value promise based bonus or sanctions		

Fig 7. Public/Private-Private Partnership Coordinator Canvas.

**Market understanding & unique insight:** PPP coordinator understands the market characteristics and its evolution which can be further developed and validated with the public/private clients.



**Selected target segment / customers:** The target groups are specifically defined by the public/private clients and the process is managed by the PPP coordinator.

**Understanding of the competitive landscape:** PP clients understand competing services in the market. The coordinator must position its offering in a competitive way.

**Product & services defined:** The District refurbishment and use plan defines the strategy for the contracts and services. Coordinator's activities are design and refurbishment procurement, refurbishment management and use phase monitoring.

**Value proposition:** Running costs at defined performance level. Private sector investment is brought to district level services.

**Customer relationship:** PPP model supports collaborative project practices. The coordinator makes sure the customer is aware of developed solutions and their evaluation.

**Channels:** The coordinator organizes PPP design and construction competition and arranges funding. Collaborative co-operation models can be used (e.g. open-book or cost-plus contracts) to ensure transparent channels for communication.

**Way of working & organization defined:** The coordinator oversees the awareness raising and participation process, project development and implementation supported by selected owners and technical experts. The authorities and users are involved in the pre-procurement process.

**Identified synergy with other businesses:** Interface with financial sector can be developed. Linking green funds and life cycle revenue streams can be exploited.

**Sustainable competitive edge:** PP partners' market knowledge, life cycle consideration and access to funding provide competitive advantage to the coordinator when properly exploited.

**Confirmed business case (profitability):** Expenses derive from coordinator's running costs. Revenue streams come from Management fee and value promise based bonus or sanctions.

**High commitment decisions made & conviction to act:** The client's commitment comes from the value promise. Coordinator's personal skills in communicating and delivering services to PP partners form the buy-in.

**Action plan and resources in place:** Coordinator must ensure the availability of needed resources with sufficient mandate.

### 4.3 Local distributed renewable energy system procurement

Group distributed renewable energy system procurement describes a joint acquisition for a renewable energy system. Activator's role is important to initiate the process. The objective is to exploit economic benefits from mass procurement. Figure 8 describes an activator led group renewable energy system procurement.

<b>Key partners</b>  Public/private client System suppliers Designers	<b>Key activities</b> 0. Pre-feasibility study 1. Collecting group of interested stakeholders 2. Design 3. Preparing procurement documents 4. Group procurement 5. Hearing process	<b>Value propositions</b>  Renewable energy easily and cost efficiently  Value based procurement	<b>Customer relationships</b>  Awareness raising, information sharing and participatory events	<b>Customer segments</b>  Project area stakeholders e.g. owners, planners  Neighbourhood associations
	<b>Key resources</b>  Procurement specialist		<b>Channels</b> Information sharing: Interactive digital platform and Big room  Face-to-face and provide services with key stakeholders: Creating and maintaining trust Social media, website, newsletters	
<b>Cost structure</b> Operating costs: Personnel costs, subcontracting etc. Marketing, promotion materials Procurement and delivery costs		<b>Revenue streams</b> Scalable models Service fees % share compensation of cost reduction compared to market level price Life cycle revenues (green fund), subsidies		

Fig 8. Activator led group renewable energy system procurement canvas.

**Market understanding & unique insight:** Activator understands the RE system market and benefits for the stakeholders on the long run. Activator manages the procurement: competition, price, brand, performance, services and tendering.

**Selected target segment / customers:** Project area stakeholders e.g. owners, planners and neighbourhood associations.

**Understanding of the competitive landscape:** Activator must understand the competition at the marketplace.

**Product & services defined:** Activator’s new consulting services - renewable energy easily and cost efficiently - expand the business possibilities. Design and installation of services are outsourced. These services are supplied through partnership network.

**Value proposition:** Renewable energy easily and cost efficiently. Value based procurement.

**Customer relationship and channels:** Information sharing: Interactive digital platform and Big room. Face-to-face and provide services with key stakeholders: Creating and maintaining trust. Awareness raising through information sharing and participatory events, social media, website and newsletters.

**Way of working & organization defined:** Activator manages the client and partner network and follows new technology and business opportunities.

**Identified synergy with other businesses:** new services are built based on existing businesses.

**Sustainable competitive edge:** cost efficient procurement.

**Confirmed business case (profitability):** optimized operating costs and incentives from the customer benefit.

**High commitment decisions made & conviction to act:** Strategic commitment will be achieved through service design for the business aiming at scalable refurbishment for defined customer segments.

**Action plan and resources in place:** Awareness raising through project area stakeholders e.g. owners, planners and neighbourhood associations. Activators' network provides extended services if needed.

#### 4.4 Renewable energy production, resource sharing and operation

The business model in Figure 9 describes an approach for common energy production at block or building level. The number of buildings is limited to avoid energy distribution to, e.g., across a street. The distribution grid or network can thus be independent and owned by the stakeholders, e.g. through a commonly owned company.

The operator of the system can be a local energy co-operative or local energy company. The approach allows energy production for common equipment used for electrical appliances, heating and cooling. The investors benefit on the low energy costs as well as attractiveness and property value.

<b>Key partners</b>  Building owners	<b>Key activities</b> 1. Strategic plan 2. Local system development 3. Local distributed energy production 4. Operation and maintenance  <b>Key resources</b> Board of the co-operative  Maintenance team	<b>Value propositions</b>  Local renewable energy at acceptable cost  Smart energy distribution	<b>Customer relationships</b>  Common discussion and development   <b>Channels</b> Awareness raising, information sharing and participatory events  Digital platforms	<b>Customer segments</b>  Building users  Energy company
<b>Cost structure</b> Investment costs Operation costs Maintenance costs		<b>Revenue streams</b> Energy savings		

Fig 9. Renewable energy production and resource sharing and operation canvas.

**Market understanding & unique insight:** Understanding of the energy market development in the future allows for a new business. The business is independent and based on the present European taxation principles.

**Selected target segment / customers:** The target segment is limited to a group of building and/or apartment owners that share the idea.

**Understanding of the competitive landscape:** The approach bases on the assumption that the method can serve lower energy prices and operational costs after investment than the existing energy producers as well as environmental targets, value increase and attractiveness

**Product & services defined:** Renewable and low carbon energy production for the owners' own use.

**Value proposition defined:** Lower energy costs for common use and zero carbon brand value.

**Customer relationship & channels defined:** Information for housing co-operative meetings.

**Way of working & organisation defined:** The owners establish and run a co-operative for energy production.

**Identified synergy with other businesses:** System maintenance is a service for the co-operative. The energy production is independent. The system can be scaled up in the future.

**Sustainable competitive edge:** The competitive edge is the lower energy costs for the co-operative members.

**Confirmed business case (profitability):** Independent energy production system's operational costs and price for the energy remain low while the energy prices in general tend to increase. Self-sufficiency decreases economic risks caused by unpredictable development of energy prices in the future.

**High commitment decisions made & conviction to act:** The co-operative requires long-term commitment to the operation. New owners need to be integrated into the co-operative by binding agreements concerning the real estate ownerships.

**Action plan and resources in place:** The co-operative needs to set rules for operation, maintenance and renewal of systems, and raise finance for the investment.

## 4.5 Enabling financing of large scale refurbishments by smart step-by-step approach

A step by step approach is a long-term development for improving the energy efficiency of buildings and utilisation of low-carbon or carbon free technologies for energy production for district level refurbishment. The approach includes actions for energy efficiency improvements of individual buildings such as energy audits and energy analysis and further district level energy analysis to harvest the best possible options for sustainable refurbishment. The business model in Figure 10 is for an activator or a developer that is the key player in this approach.

<b>Key partners</b>  Financing organisation, e.g.: Green fund Global footprint network Bank Public fund Philanthropists	<b>Key activities</b> 1. Analysis of energy saving potentials 2. Target setting 3. Analysis of refurbishment costs 4. Potential value increase assessment 5. Payback planning 6. Securing funding 7. Implementation monitoring  <b>Key resources</b> Energy expert Finance expert	<b>Value propositions</b> Profitable investment at low risk level	<b>Customer relationships</b> Awareness raising Developing dialogue  <b>Channels</b> Digital marketing channels, e.g.: Social media Interactive website Webinars References	<b>Customer segments</b>  Private building owners
<b>Cost structure</b> Preparatory costs		<b>Revenue streams</b> Provision based fee		

Fig 10. Enabling financing of large scale refurbishments canvas.

**Market understanding & unique insight:** Understand the financing mechanisms for and whole life costing of nearly zero energy refurbishment.

**Selected target segment / customers:** Private building and apartment owners.

**Understanding of the competitive landscape:** The business model bases on the low risk level of investment. We know the offering of different financing organisations such as green funds. We understand the cost / benefit ratio.

**Product & services defined:** Full service package for green energy including the technology and funding.

**Value proposition defined:** Profitable investment at low risk level

**Customer relationship & channels defined:** Developing dialogue between the activator / developer and private building owners using appropriate means such as open collaborative platform.

**Way of working & organisation defined:** Communication of technological and financial possibilities and benefits.

**Identified synergy with other businesses:** Renewable energy system providers, special designers and contractors.

**Sustainable competitive edge:** The anchor point is a lucrative offer for the customers including also financial and technical expertise.

**Confirmed business case (profitability):** Provision based fee.

**High commitment decisions made & conviction to act:** The project meets the green funds' priorities supporting the customers' decision-making and national sustainability development goals (SDG7 Ensure access to affordable, reliable, sustainable and modern energy for all and SDG11 Make cities and human settlements inclusive, safe, resilient and sustainable).

**Action plan and resources in place:** Defining the solutions and benefits with key resources energy and finance experts.

## 4.6 The energy management of buildings

Cost efficient energy management of building contributes both for reduced energy costs and improved indoor climate. These again have an impact on property values and inhabitant or user satisfaction. Figure 11 describes business model of energy management of buildings with improved indoor climate.

<b>Key partners</b>  Energy auditors, facility managers  Energy provider  Designer  Digital service provider  System and product suppliers	<b>Key activities</b> 1. Analysing present state and potential energy savings 2. Setting energy goals 3. Strategy for energy efficiency improvement 4. Implementing the strategy  <b>Key resources</b> Energy and indoor climate expert  Digital expert	<b>Value propositions</b>  Cost efficient energy management of buildings  Value increase  Better indoor climate  Positive stimulation  Customer satisfaction	<b>Customer relationships</b>  Close to end customers  Continuous discussion  Real time performance information  <b>Channels</b> Cloud based digital platform Co-creation Cave technology Virtual reality Augmented reality Game technologies	<b>Customer segments</b>          Private and institutional building owners
<b>Cost structure</b>  Energy analysis Strategy work Customer relations Energy management costs Digital infrastructure costs	<b>Revenue streams</b>  Fixed management price Value promise based bonuses and sanctions			

Fig 11. Energy management of buildings with improved indoor climate canvas.

**Market understanding & unique insight:** We understand the importance of indoor climate that can be maintained with a good energy performance of a building which also contributes to the value of a building

**Selected target segment / customers:** Private and institutional building owners.

**Understanding of the competitive landscape:** Differentiation from the basic energy management companies with knowhow on the energy and indoor climate linked with upside and value.

**Product & services defined:** Energy, technical and environmental due diligence studies and implementation of results.

**Value proposition defined:** Value increase based on improved indoor conditions and positive stimulation.



**Customer relationship & channels defined:** Cloud based digital platform using game engine integrated with CIM provides user interface in cave for customers to support and speed up their decision making through energy, indoor, value etc. visualization.

**Way of working & organisation defined:** Full scale analysis of the present situation, strategy work and implementation with energy experts, design team and system and product suppliers.

**Identified synergy with other businesses:** Construction companies specialised in refurbishment, distributed energy companies.

**Sustainable competitive edge:** Use of modern design technologies (VR, AR, game technologies) for visualisation of the outcome and increasing the commitment of actors by co-creation.

**Confirmed business case (profitability):** Fixed management price and value promise based bonuses and sanctions.

**High commitment decisions made & conviction to act:** Strategic plan created with customer(s).

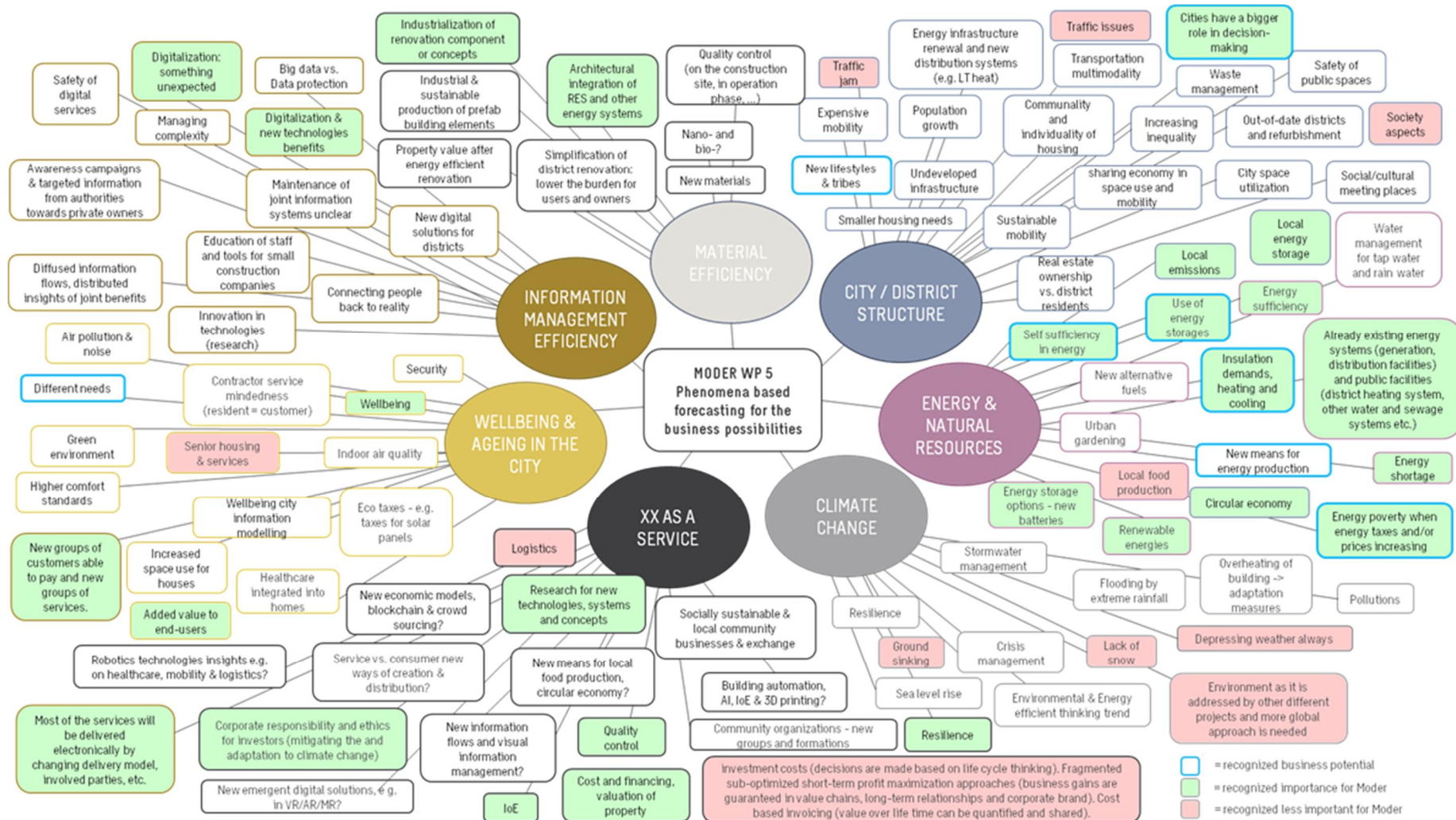
**Action plan and resources in place:** Co-operation with energy and indoor experts for accurate analysis of possibilities.

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# Appendix 1: Future trends and phenomena for business possibilities



## Appendix 2 Business possibilities for stakeholder groups

### Business possibilities for local authorities' sustainable refurbishment vision

#### Challenges:

- Organize a trusted refurbishment process for a district.
- Commitment of stakeholders for a long-term renovation plan.
- Balance of interest between different stakeholder in the district & authorities.
- Optimization of district level energy renovation.

#### Solutions:

- Checking the pre-planning of the overall strategy for the district.
- Presentation of the checked pre-planning to the district stakeholders and the possible advantages of joining the district renovation.
- Hearing the needs and opinions of the different stakeholders in the district.
- Implementing the needs and opinions of the stakeholders in the planning.
- 2. hearing with 3 renovation scenarios for the district (baseline, plus-line, double-plus-line)
- Discussion and invention of additional drivers for higher quality renovations

#### Services:

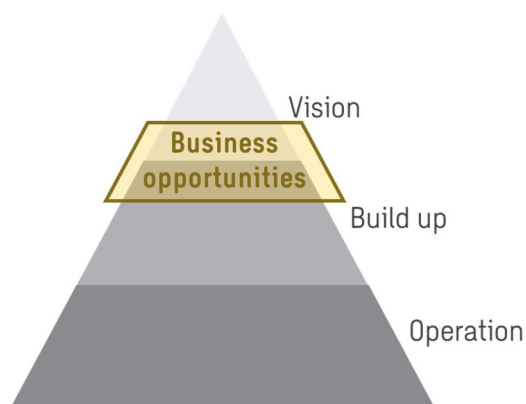
- Communication of the planning and advantages of the whole district renovation with the stakeholders.
- Balancing the needs between planning, authorities and district stakeholders.
- Motivation of stakeholders through additional drivers and negotiating between stakeholders.

#### Added value:

- Authorities: Higher success rate and trust level for execution of district renovation.
- Authorities: Possibility of higher renovation quality of the district.
- Authorities: Support decision making in difficult conflicts of interest topics.
- District stakeholders: Risk reduction for their investment.
- District stakeholders: Possible rise of property value.
- District stakeholders: Benefits of district level approach.
- District stakeholders: More recognition of needs and opinions.

#### Unique selling point:

- Trusted and independent



### Business possibilities for building owners

**Providers:** Energy consultants

**Initial supporting partners/customers:** City, energy suppliers

**Customers:** housing associations (private flat owners), housing companies (building owners/investors), house owners

**Challenge:**

- How to implement the carbon & energy strategy
- How to accelerate the refurbishment of residential buildings

**Challenge:**

- How to implement the carbon & energy strategy
- How to accelerate the refurbishment of residential buildings
- How to accelerate the refurbishment of buildings and the use of res at district level

**Solution:**

- Consultant: makes a preliminary plan for the district.
- Consultant: searches for support from the city and energy suppliers.
- Consultant: organizes district level seminars for housing associations, housing companies and housing managers.
- Consultant: offers support for owners in doing strategies; 1. Required improvements in performance, 2. Main steps, 3. Impacts

**Services:**

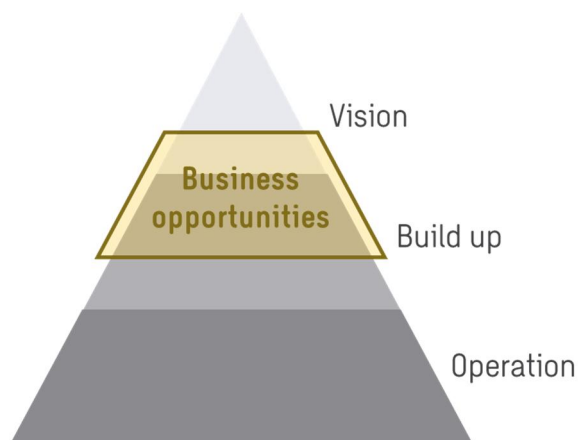
- Support the city to implement the energy strategy.
- Support the city to find preliminary ideas and solutions for saving energy and using res at district level.
- Support for housing associations and housing companies to identify needs and make a strategy for a step-wise procedure.

**Added value:**

- City: The city finds somebody to support in the implementation of the energy strategy of the city.
- Owner: Better ideas for affordable/profitable refurbishment adapted to their needs and district-specific potentials.
- Energy consultants, other providers: more customers

**Unique selling point:**

- Holistic approach
- Support from the city
- Based on true knowledge about the potentials of the district



## Business possibilities for local businesses

**Providers:** Technology and management providers, distribution grid operator

**Key customers:** Different types of local businesses, residents, real estate owners, utility companies, industry

**Challenge:**

- Make optimal use of renewable energy systems
- Electricity, heating, cooling

**Solution:**

- Software & hardware
- LCA, LCC, pre-study, proof-of-concept
- Energy from the neighbourhood
- Energy monitoring certification

**Services:**

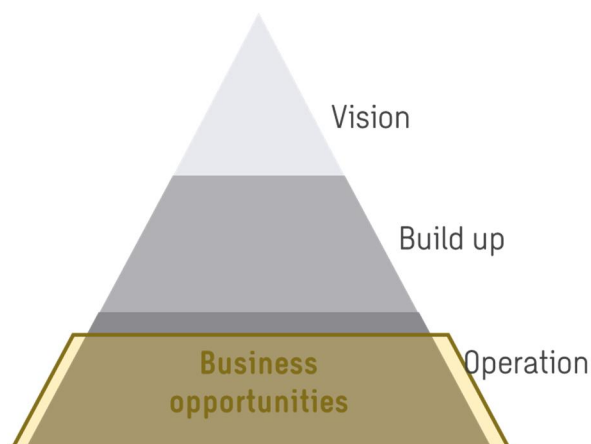
- Consulting
- Technical tool integration (BIM)
- Develop EMS (system)
- Setup the system, take in operation, maintenance

**Added value:**

- Green, decentralized energy supply
- Optimal use of a local resource
- Cost & CO2 reduction
- Unique selling point:
- Getting ready to be quick if regulations are changed
- Performance guarantees
- Different energy forms
- Value leadership

**Unique selling point:**

- Getting ready to be quick if regulations are changed
- Performance guarantees
- Different energy forms
- Value leadership



## Business possibilities for finance sector and investors

**Providers:** Investors

**Key customers:** District level projects

**Services:**

- Advice on project idea.
- Project assessment CBA: economic, social, risk
- Project financing
- Information platform

**Added value:**

- Financial institutions: profitable low risk finance
- Contractors: Project verification and viable project
- Building owners: Profit, brand, value of the properties
- Citizens: Comfort, better living conditions

**Value proposition metrics:**

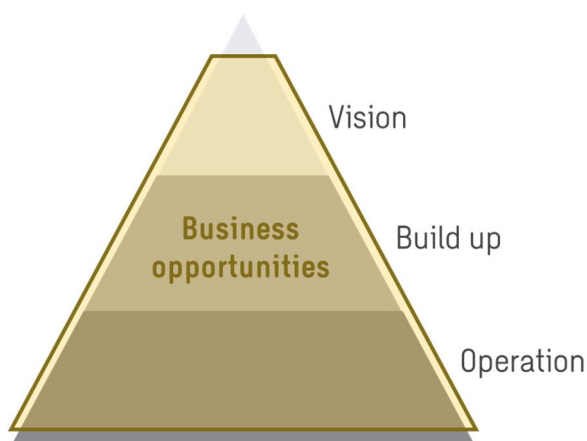
- Building owners: increase of property value
- Municipality: number of new inhabitants, tax, property, income etc.
- Contractors: profit, CSR
- Investor: Profit, CSR
- Citizens: decreased living costs

**Service metrics:**

- Size of the project
- Number of buildings included/ % of overall number of buildings in the area
- Lead through time
- Satisfaction (building owners, citizens)
- Achieved energy savings
- Length of refurbishment cycle

**Business metrics:**

- Size of the business
- Return on Investment
- Sustainability



## Business possibilities for residents

**Providers:** Consultants, industry, system providers

**Key customers:** Housing associations, insurance companies, leaseholder companies, home owners, tenants

**Challenge:**

- Development comes with a high prize
- Fear of high living costs; rents and displacement
- Renovation debt -> high investment cost
- Disturbance due to renovation
- Resident interests not met – where is the value?
- Public feels left out, lack of trust: technologies, services

**Solution:**

- A single company takes care of the whole process.
- Additional benefits (economic, living quality) -> mapping resident interests with pre-evaluation.
- Trust: Communication transparency, early participation. Visualization.
- Combining works: Economics of scale, modular renovation reduces disturbance speeding up the process.
- What should be done? -> What can be done? Sustaining -> regenerating.
- Stabilizing living costs – strategy, incremental. Concrete immediate benefits.
- Financial incentives; service provider brings funding.

**Services:**

- Incremental, small solutions with upgrade potential: Possible to choose the option affordable now.
- Centralized coordination service for combining works and communication.
- Timely communicating the readiness level; a visual app. Systematized resident feedback app.

**Added value:**

- Better living and affordable rent, simplicity, we pay your renovation, speed up the neighbourhood evolution, one stop shop for your happy life.
- 3<sup>rd</sup> party impartial certification of the technology used: increasing trust.

**Unique selling point:**

- Affordability & quality of life – safe and attractive neighbourhood

