



Co-funded by the Intelligent Energy Europe
Programme of the European Union

**Promotion of smart and integrated NZEB renovation
measures in the European renovation market
(NeZeR)**

Contract N°: IEE/13/763/ SI2.674877
01-03-2014 – 28-02-2017

Report on the successful business models for NZEBR

Date: 26.1.2016

Lead contractor: ISPE

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1 SUMMARY

IEE NeZeR project promotes implementation and smart integration of Nearly Zero Energy Building Renovation (NZEBR) measures and deployment of Renewable Energy Sources (RES) in the European renovation market.

Successful business models are necessary for facilitating and accelerating NZEBR and the deployment of RES. This report has collected and analysed relevant business models for NZEBR from several business models developed and assessed in other EU-funded research projects. This information will support companies planning to develop NZEBR concepts.

The report also involves a short analysis of relevant business models for NZEBR in the participating NeZeR countries, i.e. Finland, Netherlands, Romania, Spain and Sweden. The country specific analyses show how conditions and challenges vary between different countries. General conclusions are that deep renovation of private owned (multifamily) buildings require other business model concepts than public buildings. For NZEBR of private buildings many countries identified the *One Stop Shop model* and the *TEA case* as relevant business models. For public buildings the relevant business models varied more between the different countries. For example, the ESCO model has been widely used in Sweden and Spain, whereas it is not very common yet in Finland, the Netherlands and Romania.

2 INTRODUCTION

The increasing implementation of NZEBR projects could lead to significant energy savings and reducing greenhouse gas emissions. At the same time, the NZEBR measures involve major renovation work to the existing buildings (mainly the building envelope and the technical systems) and RES deployment.

The development process of NZEBR projects needs to find the optimal way between energy advantages and financial and economic limits in order to allow acceleration of NZEBR initiatives and the strengthening of the national NZEBR markets. This goal can be achieved based on a well prepared and interested business environment in the renovation field.

Successful business models are necessary for facilitating and accelerating NZEBR and the deployment of RES. The potential economic and financial benefits could be of interest for several companies in the field. In this report we will analyse potential success for businesses from NZEBR measures by reviewing results from several European research projects concerning business models.

One of these projects is the IEE COHERENO project, which has the objective to strengthen collaboration of enterprises in innovative business schemes for realizing NZEBR in single family owner occupied houses.

The Nordic Innovation project Successful Sustainable Renovation Business for Single-Family Houses (Success Families) identified that one-stop-shop business models have a significant business potential, since the renovation market for single-family houses could be in the order of hundreds of million Euros per year in each Nordic country. At the same time it has been difficult to start or run such a business. Therefore an analysis and development of business models that offer full-service renovation packages in the Nordic countries was conducted as well as identification of potential models that can be tested in pilot studies, which can be an important source of market information for companies planning to develop a one-stop-shop concept.

Another successful example is the EracoBuild project One Stop Shop where among other aspects One Stop Shop business models for holistic renovations have been developed.

“Novel Business model generator for Energy Efficiency in construction and retrofitting” (NewBEE) is a FP7 ongoing project. This project aims to develop the NewBEE system enabling Small and medium-sized enterprises (SMEs) to generate new performance based business models for cost and energy efficient construction works with special incidence in retrofitting. This report contains information from the NewBEE project regarding the most appropriate business models for NZEBR implementation.

3 MAIN STEPS FOR DEVELOPING BUSINESS MODELS

A business model is composed by different elements such as revenues and costs, resources, activities and internal and external relationships and networks, the value proposition to the customer, and mechanisms to capture value for the company.

Business models as a concept emerged in the literature in the mid-1990s and there have been many different opinions on the concept. The business model concept has been described in many different ways using various definitions and interpretations.

“A business model describes the rationale of how an organization creates, delivers, and captures economic, social, and other forms of values” (Alexander Osterwalder, Business Model Generation 2010).

The development of business models in the building retrofitting field has been studied in several EU projects including One Stop Shop project “From demonstration projects towards volume market: innovations for one stop shop in sustainable renovation” and SuccessFamilies-project.

One Stop Shop-project developed a guideline for how the supply side could set up a successful business model for holistic renovation of single family houses. The development work was based on experiences from pilot models in both the One Stop Shop-project and the SuccessFamilies-project. The SuccessFamilies project aimed to develop new business concepts which combined technical solutions, financing services and promotion to overcome existing behavioural, organisational, legal and social barriers to sustainable renovation.

This guideline gives recommendation to interested companies on the main steps for developing business models. The steps of the guideline are presented in following chapters.

3.1 First step: Preparation and status analysis

The first step is to collect all relevant information on which to base the decision of how to establish a One Stop Shop. The information is presented in Table 1 and it must be analysed using specific tools such as the PEST analysis, the Six Forces model and the SWOT analysis.

Table 1 – Information gathering (source: www.one-stop-shop.org)

<i>Type</i>	<i>Relevance</i>	<i>Where to find</i>
Indirect influence (PEST factors) <ul style="list-style-type: none"> • Political (regulations, tax policy, etc.) • Economic (homeowners' income level, interest rates, energy costs, etc) • Social (income levels, demographics, educational level, health, etc.) • Technological (number of new passive houses, successful renovation projects, speed of technological development etc.) 	<ul style="list-style-type: none"> • What are the most important drivers and challenges influencing the market for sustainable housing and energy-efficient renovation? • How do these factors impact the market? 	<ul style="list-style-type: none"> • Updated regulations can be obtained from the national bodies in charge of buildings. • New political initiatives within this area may normally be found on the website of the Ministry in charge of housing policy. • Statistical information for all countries can be found from the national statistical institutes. • Technological development: Research institutes and national bodies.
Identifying different segments and their potential <ul style="list-style-type: none"> • Building stock analysis • Demographic location • Newly-acquired houses 	<ul style="list-style-type: none"> • Find potential segments in an area which needs the service you plan to offer. • A segment is a specific combination of type of owners, home characteristics and their situation (e.g. newly moved in). 	<ul style="list-style-type: none"> • On a national level, many countries have advanced building stock analyses. More than, a part of them have details at a municipal level. • The technical department in the municipality has information about location and year of construction. • You may be able to identify the area of the town where people will have the financial capacity to invest in holistic renovation. • The property registry, estate agents or owner associations have information about homes that change owner.
Relevant market actors such as: <ul style="list-style-type: none"> • Suppliers • Existing competitors • Potential new competitors • Relevant substitutes for your service • Companies offering complementary services to homeowners (e.g. banks, utilities, estate agents, etc.) 	<ul style="list-style-type: none"> • What are other actors doing in your geographical area which may influence this business? • Some complementary actors may currently represent a barrier / threat to the establishment of a One Stop Shop service, but they may even turn out to be important partners. 	<ul style="list-style-type: none"> • You should already have most of this information, but have you checked their websites recently to see what services they are actively promoting? • Do you know about their financial situation? • To identify complementary actors, you need to use your local knowledge
Internal capabilities and capacities <ul style="list-style-type: none"> • Resources (skills, human resources, physical location and equipment, capital, customer base) to be used for one stop shop service. • Synergies between your existing activities and a one stop shop service? • What are your challenges today and how will this influence a one stop shop? 	<ul style="list-style-type: none"> • Do you have the preconditions for establishing a One Stop Shop? • What are your constraints in this respect? 	<ul style="list-style-type: none"> • Logically, this information must be gathered internally. • Structure (simplify) the information about financial situation, internal capacity, etc • Some of the information will also come up through internal discussions. This will also be an important part in the next step (analysis).

PEST analysis is a tool for defining the most important Political, Economic, Social and Technological issues which influence the environment and framework for the business. PEST factors are presented in Table 2.

Table 2 – PEST factors (source: www.one-stop-shop.org)

<i>Important PEST factors</i>	Opportunity (O) or Threat (T)?
<p>POLITICAL</p> <ul style="list-style-type: none"> • Building codes • Requirements for energy labelling of the house (Energy Performance Certificate) • Subsidies from governmental bodies • Tax deductibility of labour cost for maintenance, renovation or extension work • Other factors that are relevant to your situation (e.g. national mechanism as support for RES deployment) 	O/T
<p>ECONOMIC</p> <ul style="list-style-type: none"> • Energy costs • Homeowners' general income level • Mortgage interest rate • Energy efficiency loans from banks • Other factors that are relevant to your situation 	O/T
<p>SOCIAL</p> <ul style="list-style-type: none"> • Media focus: Climate change and CO2 emission reduction at the top of the agenda • Unemployment rate • Educational level • Residential area's attractiveness • Other factors that are relevant to your situation 	O/T
<p>TECHNOLOGICAL</p> <ul style="list-style-type: none"> • New and improved products • Number of successful renovation stories • Level of knowledge in the construction industry about Passive House/very efficient building solutions • Other factors that are relevant to your situation 	O/T

Six Forces model describes the actors in the competitive arena: customers, suppliers, competitors, potential new competitors, substitutes, and complementary businesses. Complementary companies often turn out to be important collaboration partners or actors which influence the market, e.g. banks charging lower interest rates on mortgages for energy-efficient renovation. As an example, Figure 1 shows all the forces influencing the complete package of One Stop Shop for home owners considering extensive renovation of their single-family houses.

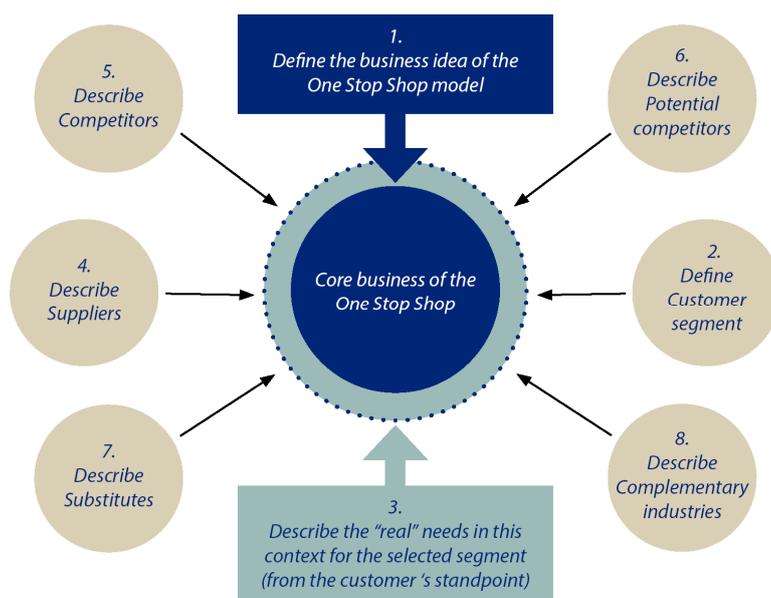


Figure 1 – Six Forces Model (source: www.one-stop-shop.org)

These two analysis models feed information into the SWOT analysis, which summarises the future internal Strengths and Weaknesses (Table 3) and the external Opportunities and Threats of the business model.

Table 3 – Internal analysis

SUBJECT	Key questions	Where to find it	
		S	W
Strategy	<ul style="list-style-type: none"> Do you have a clearly defined strategy and does the one-stop-shop fit well into it so that you are prepared to attach a high priority to its implementation? 		
Technological solutions	<ul style="list-style-type: none"> In your business today, do you apply solutions, systems and components that are relevant to energy efficient renovation? Consider if you are lacking any important elements. 		
Market knowledge	<ul style="list-style-type: none"> How well do you know the market segment(s) that you intend to address? 		
Knowledge about purchasing criteria	<ul style="list-style-type: none"> How well do you understand the homeowners' decision-making process in such projects? Are you able to list the most important purchasing criteria, i.e. the most important reasons why customers decide on an advanced renovation? Control question: How do you know this? Is it based on some type of research (customer surveys or market reports)? If it is only something you believe, could you survey a selection of customers? Be aware that unchallenged assumptions may represent dangerous blind spots. 		
Relative strengths of each of the purchasing criteria compared with competitors	<ul style="list-style-type: none"> List the purchasing criteria and, for each of them, consider how good you are compared with your competitors; whether you are stronger (S) or weaker (W). The same control question as above – is this merely an assumption or has it been tested with customers? 		
FUNCTIONS			
Management	<ul style="list-style-type: none"> What are your management competencies and capacity to develop and lead the implementation? 		
Management systems	<ul style="list-style-type: none"> How good and relevant are your management systems for launching a One Stop Shop for renovating single-family homes? 		

Training	<ul style="list-style-type: none"> Does your organisation have routines for training new and existing employees in the implementation of new knowledge? 		
Innovation level	<ul style="list-style-type: none"> What is the level of innovation in the company compared with the industry? And specifically regarding innovative solutions in renovation of single-family houses? 		
Sale function	<ul style="list-style-type: none"> Are your existing sale staffs already interacting with any of the potential market segments? Do you have a system and approach which is well suited for this market? 		
Sourcing function	<ul style="list-style-type: none"> Are you able to stay up to date about new products and solutions? 		
Production function	<ul style="list-style-type: none"> How efficient are you in executing your services? 		
After-sales function	<ul style="list-style-type: none"> Have you established an after-sale function and is it appropriate to the one-stop-shop concept? 		
RESOURCES			
Physical	<ul style="list-style-type: none"> Do you have the appropriate physical resources for launching the one-stop-shop (buildings, transport, tools and equipment)? What is their status? 		
Human	<ul style="list-style-type: none"> Do you have people available with the capacity and enthusiasm to launch the concept? 		
Relations & networks	<ul style="list-style-type: none"> Do you already have good relations that can be used for this purpose? What is your evaluation of their competency for this purpose? 		
Organisation	<ul style="list-style-type: none"> Does your organisation possess the necessary skills to launch the concept? How does the team feel about the idea? 		
Board	<ul style="list-style-type: none"> Has the Board been involved? Are there resources within the Board which may positively contribute to a successful launch? 		
Financial freedom of action	<ul style="list-style-type: none"> Consider your financial situation. Is your enterprise solid enough to finance the development of a new business which probably needs some time before it can generate positive cash flow. Alternatively, do you have an owner willing to invest more in this initiative? 		

(source: www.one-stop-shop.org)

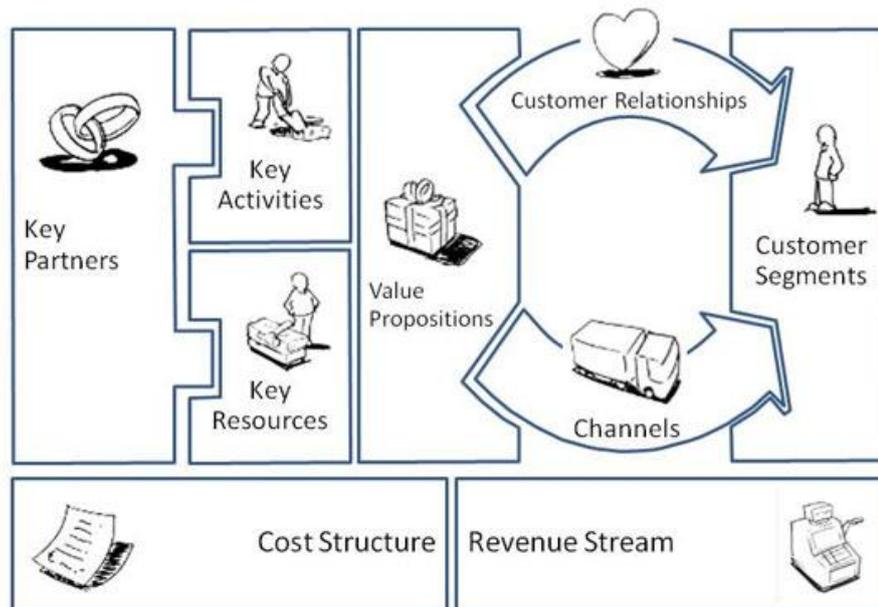
All the SWOT factors identified in the previous sections are summarised in the SWOT matrix (Table 4), supplied with other relevant ideas coming up during the discussions. The matrix summarises the status of all important factors that have to be considered in further planning of the new business. It also forms the information foundation from which the business model is developed.

Table 4 – SWOT analysis (source: www.one-stop-shop.org)

Strengths	Weaknesses
1.....	1.....
2.....	2.....
Opportunities	Threats
1.....	1.....
2.....	2.....

3.2 Second step: Business Model Canvas

Based on the previously presented analysis, the company in charge of the future business collaboration is recommended to draw up a business model for the activity using the Osterwalder & Pigneur “Business Model Canvas”, which consists of following nine blocks: customer segment, value proposition, key activities, key partners, key resources, customer relationship, channels, cost structure, and revenue stream (Figure 2). These building blocks, which form the basis for a tool called “business model canvas” (Table 5), are used to discuss a full-service or one-stop-shop concept for energy-efficient renovation.



Source: <http://www.businessmodelgeneration.com/>

Figure 2 – Business Model Canvas

➤ **Customer segments (CS):**

Profitable customers are central to success of a business. It is important for an enterprise to identify the groups of people or organizations which it intends to serve. The customer segment could be mass market, niche market, segmented or diversified.

➤ **Value proposition (VP):**

This building block describes the bundle of products and services that solve a customer problem or satisfy needs of a specific customer segment.

➤ **Channels (CH):**

The “channels” building block describes how a company communicates with and reaches its customers to deliver a value proposition.

➤ **Customer relationship:**

This building block describes the type of relationship a company establishes with specific customer segments. Customer relationship is aimed to attract new customers, retain existing customers and encourage repurchase.

➤ **Revenue stream (RS):**

The revenue stream building block represents the source of income for a company, e.g. through the sale of product/services, commission from suppliers or partners, fees for coordinating suppliers and buyers, fees to rent/lease equipment, etc.

➤ **Key resources (KR):**

This building block describes the key resources or assets required to deliver the value proposition. Those resources can be physical, intellectual, human capital, or financial.

➤ **Key activities (KA):**

This building block describes the most important things required to create and offer a value proposition, reach markets, maintain customer relationships, and earn revenue.

➤ **Key partnerships (KP):**

Each company has its core competency and it may be illogical or uneconomic for the company to own all resources or perform all activities by itself required to offer the value proposition. Hence, companies create partnerships to optimize the allocation of resources and activities, reduce risk and uncertainty, or acquire specific resources and activities.

➤ **Cost structure (CS):**

This building block describes the most important costs inherent in the business model and highlights the most expensive key activities and key resources.

Table 5 illustrates a business model canvas applied to full service or one-stop-shop concept for energy efficient renovation of single-family houses (Based on Osterwalder and Pigneur, 2010).

Table 5 – A business model canvas applied to full service/one-stop-shop concept (source: <http://successfamilies.vtt.fi>)

Key partners	Key activities	Value proposition	Customer relationship	Customer segments
<ul style="list-style-type: none"> • Partnership may vary from country to country. • Key activities and resource acquired depends on who offers the service. 	<ul style="list-style-type: none"> • Marketing • Building inspection and energy audit • Present report with recommendations and energy certificate • Project management • Customer service • Information provision on energy efficient use of the house. 	<ul style="list-style-type: none"> • One-stop-shop to offer all types of home renovation services, especially energy efficiency measures • On-site visit • Single-point contact • Provide knowledge on holistic renovation including potential extension of the house. • Energy audit / building 	<ul style="list-style-type: none"> • Personal assistance • Dedicated personal assistance • Communities: Provide an online platform for customers to discuss with each other. 	<ul style="list-style-type: none"> • All houses in need of renovation are of interest, but initially houses built before 1980 are targeted • Two distinct segments are: houses on sale and houses where homeowners lived for long time.

	<p>Key resources</p> <ul style="list-style-type: none"> • Physical: usually available with renovation firms • Intellectual (Brands, partnerships, customer database etc): e.g. homeowners may trust the work of large or medium size local construction companies (brand); Energy suppliers have database of customer energy use; Building consulting/energy auditing companies have database of condition of houses sold • Human (skill and experience): e.g. energy consultants has knowledge of energy auditing and calculations • Financial: required to start and run a business 	<p>inspection by an independent agency</p> <ul style="list-style-type: none"> • Fixed price for the total work as agreed in the contract • Guarantee on the renovation work • Help obtain onstruction permissions and apply for subsidies • Financing • Information provision on energy efficient use of the house, 	<p>Channels</p> <ul style="list-style-type: none"> • Advertisement in newspapers and magazines • Home delivered fliers • Meetings • Sales force • Web sales • Own stores • Partner stores/partner contacts • Wholesaler 	
<p>Cost structure</p> <p>Depends on cost driven or value driven model.</p> <ul style="list-style-type: none"> • Fixed costs • Variable costs • Economies of scale 		<p>Revenue stream</p> <ul style="list-style-type: none"> • Asset sale (equipments and building products) • Brokerage fee (coordinating the customers and suppliers) • Subscription fee (e.g. ESCOs offer service for a monthly fee) 		

3.3 Third step: Strategic focus and implementation

Based on the SWOT analysis and the Business Model, the partnership between the actors contributing to a One Stop Shop must define their level of ambition through a vision statement. Making strategic choices also includes being clear on what you are not going to do. A typical pitfall for many companies is that they make too many compromises in order to keep everybody happy.

In order to implement the strategies that have been developed, a specific action plan is needed which defines planned progress, responsibilities, and the necessary resources (financial and human).

Satisfied customers can be a major source of recommendations to other potential customers. Business developers should think about how to use such experiences and peer-to-peer communication for market development. The guidelines recommend that you should tell your customer: if he/she is not satisfied, to tell you, but if he/she is satisfied, to tell all his/her friends. An evaluation of every project to ascertain customer satisfaction and identify how they first heard about the service will give important input in order to improve and promote the service. The aggregated knowledge will also drive change, e.g. in marketing strategies, as the market develops.

After-sales services should be offered to maintain contact with customers. They should include periodic reviews and maintenance of the installations, which also means potential additional sales for the One Stop Shop company.

4 EXAMPLES OF BUSINESS MODELS IN CONSTRUCTION FIELD

4.1 ESCO business model – ACCIONA

Introduction

There are some reasons why companies such as ACCIONA set out a business Plan for an ESCO. The points analysed are described below:

Company:

- The objective of an ESCO is closed to the mission of ACCIONA and it is perfectly aligned with different business fields of the company (engineering, construction and energy)
- Know How - it has developed different technical tests that allow finding an adequate methodology to implement into an ESCO.

Environment:

- The trend in Europe in general, and Spain in particular, is imposing more restrictive standards of energetic consumption:
 - Energetic level for new buildings and big refurbishments.
 - Directive 2010/31/EU that demands governments to renovate at least a 3% annually of the total area of its public buildings with heating and / or cooling systems.
 - Constant and evident increases of energy prices.
- The trend of the market for the implementation of environmental certification systems in which the energetic efficiency is a key component.

Clients:

- The usual clients of different business areas of the company will be the same who will be offered the ESCO service. However, at the same time it will be necessary to create a new clients portfolio.

Contributors:

- Excellent relationships with financial institutions. It is an important issue in a business that requires important investments.
- Negotiating power with different suppliers of materials, equipment and subcontracting into the construction market
- Excellent relationships with architects, as potential Brand advocates of the construction company

Competitors:

- In a new market which involves aspects of the usual core business of construction and engineering it seems logical to think that usual competitors of the company try to develop new business in this sector. It could be a long-term threat to the company if it does not rank well and if there is not enough time to react to this.

Business model

ACCIONA business model can be mapped to the conventional approach of Business Model Canvas template as shown in Table 6 below.

Table 6 – ACCIONA ESCO business model (source: www.newbee.eu)

Key partners <ul style="list-style-type: none"> • Other companies inside of ACCIONA holding group (construction, engineering, etc) 	Key activities <ul style="list-style-type: none"> • Sales implementation state • Previous audit / Tendering preparations • Refurbishment works / Commissioning and operation / Cost control • Financial planning 	Value proposition <ul style="list-style-type: none"> • Reduction of the energy bill costs • Improve of building conditions through energy retrofiting (building envelope and technical system) • Financing • Improve the internal comfort conditions • Reliability • Customized service • Regulatory Compliance • Energy operation of the building during the life of the contract 	Customer relationship <ul style="list-style-type: none"> • Dedicated personal 	Customer segments <ul style="list-style-type: none"> • Private owners • Public owners
	Key resources <ul style="list-style-type: none"> • Technical • Brand • Human • Financial 		Channels <ul style="list-style-type: none"> • Direct – sales force , tenders • Indirect – architects, engineers, building companies 	
Cost structure <ul style="list-style-type: none"> • Administration • Personnel cost • Sales; • Equipment • Support costs (legal, insurance, etc.) 		Revenue stream <ul style="list-style-type: none"> • Fix fee+variable costs for energy consumptions 		

Advantages

- One of the most important features of this business plan is that it serves as a path that allows measuring if the objectives and the routes are achieved in the way that they were designed.
- It will be an instrument to obtaining credibility inside and outside the company and it will allow gaining access to new resources.
- Without this business plan, it will not be possible to have knowledge about competitors, clients, context, collaborators and what ACCIONA is taking into account regarding all these aspects.
- To know the value propositions from ACCIONA, and if this business is a red or a blue ocean.
- To know when to stop.

Disadvantages

- One of the disadvantages is to rigorously follow the business plan and not to take changes of reality into account.
- If some important aspect of this plan has a relevant change during the process, the business plan could become an obsolete one.

References

<http://www.acciona.es>

<http://www.madrid.org>

<http://www.newbee-wiki.eu>

4.2 One-Stop-Shop business model

Introduction

There is a huge potential for energy efficiency improvement in single-family houses, and it is usually most cost efficient to realise the actions in connection to other renovations that would have been conducted for other reasons, e.g. to improve functionality or overall aesthetics of the building. The single-family house owner is however seldom expert in energy efficiency, and nowadays the renovation market for single-family houses is very fragmented and handicraft dominated. The house owner would benefit from a service that offers the optimal solution for his/her house based on a thorough analysis on the needs of the house owner family and the condition of the house. There was also a need from the service providers' side, to be able to provide high-quality service and to gain long-standing customers. There was a lack of business models to offer such a solution on the market, and therefore an ideal model was developed in a SuccessFamilies and One-Stop-Shop projects.

The applicability of the business model was also tested by some market actors in connection to these projects.

Some companies have started to offer full service renovation of detached houses in the Nordic countries (e.g. Bolig-Enøk in Norway, K-Rauta & Rautia and ENRA in Finland, Dong Energy Cleantech and ProjektLavenergi in Denmark and Energieffektiva Hus AB in Sweden).

Business model

A thorough analysis of these business models was conducted in SuccessFamilies with the use of the Osterwalder and Pigneur (2010) canvas. Tables 7-10 present the main features of these models.

Table 7 – ENRA business model (source: <http://successfamilies.vtt.fi>)

Key partners	Key activities	Value proposition	Customer relationship	Customer segments
<ul style="list-style-type: none"> • Renovation company (service provider) • Window and door manufacturer • Ventilation system manufacturer/supplier • Insulation manufacturer • Heat pump supplier • Energy auditor and certificate supplier 	<ul style="list-style-type: none"> • Marketing • Building inspection and energy audit • Present report with recommendations and energy certificate • Fixed price offer for holistic renovation • Project management: help obtain approvals from local authorities and apply for subsidies, quality assurance, inspection when renovation is completed • Service/after sales • Offer guidance on how to use the house in an energy efficient way 	<ul style="list-style-type: none"> • One-stop-shop to offer all kinds of renovation services • Personal visit on site • Scheduled renovation plan • Single-point contact • Provide knowledge on holistic renovation • Fixed price for the total work as agreed in the contract • Energy certificate • Information provision on energy efficient use of the house • Project management • Help obtain construction permissions and apply for subsidies 	<ul style="list-style-type: none"> • Dedicated personal assistance 	<ul style="list-style-type: none"> • Primarily single-family houses from 1940-90's (mainly so called "Veteran houses")
	<p>Key resources</p> <p>At the moment, the concept is "resting" and is not offered at all</p> <ul style="list-style-type: none"> • Project managers • Administration and marketing personnel • Renovation employees • System installers from subcontractors • Equipment for renovation • Vehicles for transportation of people and equipment • Known brands of the suppliers 		<p>Channels</p> <ul style="list-style-type: none"> • Information on geographic area specific newspapers • Information on the website of local house owner's association • Information on the core company's website • Invitation to local information evenings • Home visits • Telephone 	

<p>Cost structure</p> <ul style="list-style-type: none"> •Material costs •Salaries & overheads •Marketing costs •Travel costs •Subcontracting from the other partners 	<p>Revenue stream</p> <ul style="list-style-type: none"> •The energy audit and the energy certificate •Renovation material and work •Installation of systems
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Table 8 – K-Rauta & Rautia business model (source: <http://successfamilies.vtt.fi>)

<p>Key partners</p> <ul style="list-style-type: none"> •Hardware store chain (service provider) •Product and material suppliers (insulation, heat pumps, heating systems, ventilation systems, fireplaces, windows, doors, lamps, all other building materials) •Renovation service providers: planning, installations, renovations, energy surveys, heat camera inspections •Bank 	<p>Key activities</p> <ul style="list-style-type: none"> •Marketing •Selling all products which are needed in house renovations: insulation, heat pumps, heating systems, ventilation systems, fireplaces, windows, doors, lamps, all other building materials •Selling (in cooperation with company customers) most of services which are needed in house renovations: planning, installations, renovations, energy certificate, heat camera inspections •Flexible financing services •Energy surveys •Solutions are sold in easy and understandable packages/modules •Energy saving renovation service centers inside the stores 	<p>Value proposition</p> <ul style="list-style-type: none"> • One-stop-shop to offer all kinds of renovation services •Fixed price offer, minimum surprises of extra costs •Different ways of buying: all installed, partly installed, just products. Flexible project schedules, etc. •All other building and housing material products and services also from same vendor. •Flexible funding, frequent customer benefits •Easy access energy saving renovation services under one roof and getting all from one trusted vendor, nationwide 	<p>Customer relationship</p> <ul style="list-style-type: none"> •Dedicated personal assistance 	<p>Customer segments</p> <ul style="list-style-type: none"> •People renovating their houses (not defined more in detail)
	<p>Key resources</p> <ul style="list-style-type: none"> • Two well-known brands • Distribution network • Customer database through Kesko group • Large variety of products available through stores 		<p>Channels</p> <ul style="list-style-type: none"> • Active sales out from stores 	
<p>Cost structure</p> <ul style="list-style-type: none"> •Material and product costs •Labour costs (salaries & overheads) •Marketing costs •Travel costs •Subcontracting of the renovation work 		<p>Revenue stream</p> <ul style="list-style-type: none"> •Payment from customers from the services and products purchased •Commission from product suppliers 		

Table 9 – Enrenov business model (source: <http://successfamilies.vtt.fi>)

Key partners <ul style="list-style-type: none"> •Renovation company (service provider) •Energy auditor (partner) •Retailer/installer of heating systems (partner) 	Key activities <ul style="list-style-type: none"> •Marketing •Building inspection and energy audit •Present report with recommendations and energy certificate •Cost estimation for holistic renovation packages •Project management: help obtain approvals from local authorities and apply for subsidies; renovation including product purchases; quality assurance; post renovation commissioning •Customer service •Post renovation information provision to the customers 	Value proposition <ul style="list-style-type: none"> •Offer all types of home renovation services •Single-point contact •Free-of-cost preliminary building inspection/energy audit report •Detailed energy analysis/building inspection by independent agency •Free of cost price estimation for the renovation work •Help apply for subsidies and obtain construction permissions •Coordinate with banks to facilitate mortgage financing •Fixed price for the total work as agreed in the contract •Guarantee on the renovation work for two years •Free of cost information on energy efficient use of the building 	Customer relationship <ul style="list-style-type: none"> •Dedicated personal assistance 	Customer segments <ul style="list-style-type: none"> •Houses built before during 1960-80 and heated with resistance heaters, but all houses in the need of renovation are of interest •Homeowners who have capacity to increase their mortgage loan
	Key resources <ul style="list-style-type: none"> • Vehicles and machines, energy audit equipments • Skill and experience to attract customers, conduct proper energy audit, and to do quality renovation • Energy analysis tools and database of condition of houses • Finance to start and run a business 		Channels <ul style="list-style-type: none"> • Advertisement in newspapers and magazines, home delivered fliers • Local area meetings • On site visit to the homeowner • Website, telephone, email • Interaction with energy auditors when house is sold • Interaction with heating system retailers/installers 	
Cost structure <ul style="list-style-type: none"> •Costs involved in traditional renovation (labour, material, free of cost building inspection etc.) •Marketing costs •Cost for post-renovation commissioning and information material 		Revenue stream <ul style="list-style-type: none"> •Payment for detailed energy analysis (if renovation is not executed) •Payment from customers for renovation work •Commission from suppliers of building products and heating systems 		

Table 10 – Comparative assessment of existing models from Finland and Sweden (source: <http://successfamilies.vtt.fi>)

	ENRA	K-Rauta & Rautia	Enrenov
Customer segments	1940-90	All houses in the need of renovation	1960-80s
Value proposition	Full-service renovation No financing Services	Full-service renovation (on customer choice from do-it-yourself to turnkey) Includes financing	Full-service renovation No financing
Channels	Mass media and website Local meetings Personal contacts Key partner contacts	Mass media and website Local (mass) media Personal contacts Own stores	Mass media and website Local meetings Personal contacts Key partner contacts
Customer relationship	Dedicated personal assistance	Dedicated personal assistance	Dedicated personal assistance
Revenue stream	Customer payment for the renovation	Customer payment for the renovation Commission from suppliers	Customer payment for the renovation and detailed energy audit and analysis report Commission from suppliers
Key resources	Project managers Administration and marketing personnel Renovation Employees	Two well-known brands Distribution network	Labour, equipment, and skill and experience for energy audit and renovation Energy analysis tools and database of condition of houses Finance to run the business
Key activities	Marketing Building inspection and energy	Marketing Building inspection and energy	Marketing Building inspection

	audit Project management Help obtain approvals from local authorities and apply for subsidies Completion of renovation Post-renovation inspection Post renovation information provision to the customers Service/after sales	audit Project management Help obtain approvals from local authorities and apply for subsidies Completion of renovation (with help from partners) Solutions are sold in easy and understandable packages/modules	and energy audit Project management Help obtain approvals from local authorities and apply for subsidies Completion of renovation Independent post renovation inspection Post renovation information provision to the customers Service/after sales
Key partners	Service provider: renovation company Key partners: products/heating system suppliers, energy auditor	Service provider: hardware store chain Key partners: product manufacturers. Installation companies, energy auditors, financial institutions	Service provider: renovation company Key partners: heating system retailers/installers, energy auditor
Cost structure	Material and product Salaries & overheads Marketing Travel Subcontracting from the other partners	Material and product Salaries & overheads Marketing Travel Subcontracting from the other partners	Costs involved in traditional renovation Marketing Post-renovation commissioning and information material
Possibility for improvement	Possibility for improvement Financing Guarantee on energy savings Independent quality advice by third party	Guarantee on energy savings Independent quality advice by third party Actively search for customers	Financing Guarantee on energy savings

The comparative assessment of existing or proposed one-stop-shop models in Finland and Sweden showed that the value proposition varies, which means there are possibilities for improvements. Also, in the ENRA and Enrenov (proposed) models the service provider actively looks for customers through local meetings, while it is not the case in K-Rauta & Rautia model. One major issue is how to offer independent but quality advice to the customers in order to improve trustworthiness of the business proposition. In the ENRA and Enrenov (proposed) models the financing is not available, and guarantee on energy savings is lacking in all models.

Advantages

In the ideal model, the main advantages for the customer are the easy access to the service, and the holistic solution offered. The customer gets a suggestion of the renovation actions and their optimal order considering his/her own needs, but can him/herself choose which parts of the renovation he/she wants to realise and in which order. The customer does not need to find the experts and craftsmen him/her, and always knows who to contact.

For the service provider it is easier to have the same co-operation partners in most usual situations, and the service provider can be sure that the customer gets a good and reliable solution or material, on agreed timing. Finding providers for the less frequently needed materials or services gets easier with the collaboration network, as everybody brings along their own established networks. Once the customer gets a good impression of the easiness and trustworthiness of the service, he/she is likely to return on other needs for renovation.

Disadvantages

One clear disadvantage of one-stop-shop model is the difficulty to convince the customer on the advantages of holistic view instead of step-wise actions for overall energy performance and costs. Also, when one actor makes the audit of the building, suggests needed renovation actions and offers to realise them, it requires a remarkable trustworthiness of the service provider. One way to overcome this issue is to work with well trusted actors on e.g. the energy audits.

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4.3 TEA case – Design Company’s business concept for energy-efficient retrofitting based on customer profiling and management of initial building data

Introduction

The relevance of the building renovation market has become increasingly important assessed in Finland and the building renovation projects give approximately the same amount of work for building professionals in this country as new building. According to Statistics Finland 2012, the total value of building renovation projects was about 43% of total new building and renovation building projects.

The building renovation for increasing the energy performance requires a competent and innovative service offering based on the exploitation of new technologies suitable for building renovation and business concepts based on example of successful projects. To operate successfully in the renovation market, both contractors and designers need to develop their business models. There is still a dilemma between the building owners’ main motives to start building renovation and, on the other hand, the Finnish governments and the overall social goal to rapidly and efficiently decrease the energy consumption of the existing building stock. The ability to profile customers and better understand customers’ objectives and simultaneous strong management of building specific initial information to understand the technical and energy related needs and potentials are important. These may form an excellent base to successfully operate in the building renovation market through tailored design offering. The collaboration of Project Manager (PM) and Principal Designer (PD) becomes more and more important and the PM’s traditional role to especially take care of economic issues is not enough anymore.

Business model

The business model is based on the premise that

- the PD’s good understanding of customer’s motives and expectations help formulate right targets for design and construction.
- although a careful investigation of the building’s condition and possible damages causes extra cost in the beginning of a renovation project, good knowledge about building’s initial condition often saves costs of actual design and construction for example because less changes need to be conducted during the process.

The key activities of the business model are customer profiling with the help of a tool that aids to define the main motives, targets and expectations of the customer and good management of initial (condition and damage related) data of the building. Table 11 presents the main components of this business model.

Table 11 – TEA business model (source: www.newbee-wiki.eu)

<p>Key partners</p> <ul style="list-style-type: none"> • Consultant (energy auditor) • Consultant (initial model creation) • Other designers (structural, HVAC) • PM 	<p>Key activities</p> <ul style="list-style-type: none"> • Client profiling • Communication strategy • Best practice checklists; continuous improvement of the process through internal coaching and mentoring. 	<p>Value proposition</p> <ul style="list-style-type: none"> • Effective process management with the aid of sufficient initial information as the PD • Improved value of the building which also lasts longer • Improved energy performance and life cycle cost savings • Satisfied owners and tenants • Better budget management 	<p>Customer relationship</p> <p>When PD is the client's first contract:</p> <ul style="list-style-type: none"> - new model for offering; - new model for contract - consideration of initial data - more weight on advising the client throughout the project phases - new marketing material based on success cases 	<p>Customer segments</p> <ul style="list-style-type: none"> • Location: Southern Finland, growth centres with purchasing power and good prospects • Type of buildings: multi-family buildings, office buildings
<p>Cost structure</p> <ul style="list-style-type: none"> • Work cost (it makes 75% or more of the whole costs) • Marketing cost (it is only a fragment of the whole work costs) • Planning costs (they are a small part of all cost structure, but decision can have an important impact on the final costs). 	<p>Key resources</p> <ul style="list-style-type: none"> • Project Designer (PD) • Project manager (PM) • Team • BIM ¹(possible) • Initial data 		<p>Channels</p> <ul style="list-style-type: none"> • When the architect office is the PD and architect : <ul style="list-style-type: none"> - marketing pipeline: AIDA model² or other similar models - Strong service model based on management and directing other experts - Design and delivery model + reference process (project level) • Type of project: public projects are not included 	
		<p>Revenue stream</p> <ul style="list-style-type: none"> • Saved costs and increased profit with the help of well-structured and well-managed process; • More efficient sales and thus better profit with the help of effective client profiling, initial data management and well-focused offering • Payment is agreed and differs from project to project • The cost of additional work and changes should be priced separately • Bigger projects are better from the organizational point of view. 		

Advantages

The main advantage is the possibility to effectively manage the whole process as the principal designer. The improved management of the overall process is based on the preparation of:

- checklists and checklist like tools for different tasks and process phases
- communication strategy and process description which defines the roles, tasks and responsibilities of the PD, PM and other partners of the team, both internally within the company and with the client to improve communications
- new strategy and process description for the management of all project related materials
- marketing material which makes use of success cases to support the sales

¹ BIM (Building Information Modelling) is becoming popular in the whole construction industry for new buildings and is feasible to use in renovation projects.

² The AIDA model is useful when there are sets of promotional objectives. In the AIDA model the potential customers go through a psychological process before purchasing a product/service. This model has four stages: Attention (the aim of promotion is to reach the target audience and make them aware of the product/service), Interest (the aim is to make them interested in the product/service), Desire (it tries to appeal to the people who have a need they wish to fulfil) and Action (the aim is to get people to take action and purchase the product/service).

- new templates for offering and contracting considering better management and understanding the client needs and building's initial information to support the sales
- possibly a template for project preparation phase with emphasis on the above mentioned identified major themes
- clear new way of working, which is also conveyed to the client and is beneficiary for the whole process, where all parties understand what is expected and what their responsibilities are in different phases of the project; it should also in a clear way convey to the client why it is a more cost efficient way of managing the project.

Disadvantages

The possible disadvantages of the model are the resources needed to produce all process descriptions and checklists needed. It may also be difficult to make sure that all adopt the new working models. The commitment of the whole organisation is needed. As the idea is very much based on creation and availability process descriptions, checklists and tools, the maintenance and keeping the material up-to-date may also cause problems.

The success is also very much based on the possibility to keep the value propositions. Thus it is highly important to be able to create reliable initial information about the building and rely on the initial model (created by another consultant). In order to make reliable assessment about the saving potentials in terms of energy and costs, the actors involved must be able to use appropriate tools for energy performance assessment, and be able to make justified conclusions about the savings. Here the quality of the initial information is highly important. In addition, a solid understanding of the users' behaviour and willingness to commit to energy savings is essential.

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4.4 SME cluster collaboration for large real estate retrofitting

Introduction

Generally, the SMEs scope, competences and resources are limited for developing large construction investments, particularly large real-estate retrofitting projects. Mainly in the public sector, where the competition is based on the "lowest price" criterion, the SMEs have many difficulties to win the projects. An important opportunity is the adaptability and flexibility of SMEs to different contractual arrangements. This can be implemented only by a

group of companies covering all required competences, in well organised collaborative approach. The operation and maintenance organisation and end-users should be directly involved. These actors have key impact on high performing building (retrofitted building) and with that also to overall outcome (economic, environmental, social) of the retrofitting project. The DBOM (Design-Build-Operate-Maintain) project delivery method should be implemented and/or supported by organisations, services, methodologies and project delivery activities.

Business model

Each real-estate, as larger building retrofitting project needs slightly different business models according to building ownership, building typology, scope of the retrofitting, requirements, barriers such as available financing, actors engaged, guarantees, referenced projects, etc. The actors in the retrofitting project life cycle should be able to choose the optimal business model, and should be able to realise it (organisation, contracts, resources, knowledge, and technical competences). Solid and well defined methodology and tools (ICT) are needed for the project based on development and implementation of these novel business models. An individual SME is limited in many ways to reach these goals. The only solution is a collaborative, cluster or networked based approach. Table 12 presents a business model for this case.

Table 12 – SME cluster collaboration business model – Slovenian case (source: <http://www.newbee-wiki.eu>)

<p>Key partners</p> <ul style="list-style-type: none"> •Owners •ECO fund •Banks •ESCO 	<p>Key activities</p> <ul style="list-style-type: none"> •Marketing •Awareness •Consultancy on best technologies •SME cluster set-up and management •Negotiation, bidding <p>Key resources</p> <ul style="list-style-type: none"> •Subsidies •Know-how on technology •Know-how on investment schemes 	<p>Value proposition</p> <ul style="list-style-type: none"> • Comprehensive approach • Sustainable performance based on life-cycle approach • Integrated design • Overall project management; • Supervision of retrofit work; • Quality assurance scheme and its implementation • Commissioning and handover 	<p>Customer relationship</p> <ul style="list-style-type: none"> •Dedicated team •Associate cluster member <p>Channels</p> <ul style="list-style-type: none"> •Direct •ENSVET network³ •Workshops •Web portal 	<p>Customer segments</p> <ul style="list-style-type: none"> •Individual houses, flats – one owner ; •Non-residential buildings – mix or individual ownership •Multi-family buildings – many owners; •Public buildings (schools, hospitals, offices)
<p>Cost structure</p> <ul style="list-style-type: none"> •Direct project costs •Overhead •Supporting costs (i.e. guaranties) 		<p>Revenue stream</p> <ul style="list-style-type: none"> •Combination of different financing sources (client's own funds, subsidies, bank loans, ESCO, etc) 		

Advantages

Since the structure is not fixed, a cluster can adjust to each project both in size and differentiation of expertise. Deep specialisation is possible if the cluster is formed to cover all the necessary functionalities (all for one and one for all). Information on good practices, best (the most appropriate) retrofitting technologies, materials and system implemented is a valuable knowledge base for future projects.

Demonstration projects and possible demo short term living in passive houses and/or apartments enable collection of end-user's assessments of the technologies implemented and overall building performances. Cluster of SMEs with a very informal structure can act as a big company but yet without expensive bureaucracy.

³ Energy Advisory Network in Slovenia (<http://www.gi-zrmk.si/ensvet.htm>).

Dislocated partners (often even internationally) are motivated for a daily use of ICT instead of meeting in person with encouraging of tele-working, videoconferencing, common data storage, knowledge base. Since there are more independent partners, the vulnerability of the whole cluster is lower. The change of one partner in case of a problem is faster and more transparent to all partners than in case of problems in one department of a big company.

Disadvantages

When the client is from the public sector, it is necessary to define the leader of the SME cluster to be possible to contract projects. Definition of the leading SME partner can be a problem. Legal issues have to be cared about (contract forms, assurances in the case of SME bankruptcy, responsibilities and guarantees for longer time).

References

NewBEE-Wiki: www.newbee-wiki.eu

4.5 Sustainable design and building - the business concept

Introduction

Many clients, especially professional clients, are setting requirements for sustainable performance, demanding value and also measuring it. This request from the client is a demand for a new kind of business model that can express their value proposal and value promise and activity outcome with reference to suitability indicators.

The value is defined during target setting, followed up during concept design, developed and technical design and construction process, and assessed in handover phase.

The producers (designers and contractors and life cycle operators) are responsible for value configuration. The value can be defined as value for the client and value for the client's customer. The assessment can be done with sustainability indicators and sustainability assessment methods. Rating tools such as BREEAM and LEED and DGNB include criteria and assessment matrices for different kinds of buildings. Minimum requirements for assessment criteria and indicators for sustainable buildings have also been standardized as well as calculation methods and rules. Although the current ISO and EN standards support the assessment and comparison of buildings, these standards provide no information on benchmarks. In the past, the sustainability assessment was mostly used for marketing purposes. However, now the situation has changed so that the definition of project objectives and the process of planning are increasingly guided by the sustainability content. This requires changing the course of the sustainability assessment and the use of the results.

Business model

Table 13 presents a business model where an actor together with partners formulates its value proposal in terms of sustainable building. This is a holistic concept where the actor is able to support the customer in setting sustainability requirements and able to produce an end product that fulfils the requirements. Because of the holistic nature of sustainable building, the model requires close collaboration of all partners in the value chain and all partners' commitment to the proposal.

Table 13 – Sustainable building business model (source: <http://www.newbee-wiki.eu>)

Key partners <ul style="list-style-type: none"> • Design team (all disciplines) • Design management 	Key activities <ul style="list-style-type: none"> • Achieving the target values • Control 	Value proposition <ul style="list-style-type: none"> • Value promise – target value • Definition of the value measure 	Customer relationship <ul style="list-style-type: none"> • Long lasting relationship brings effectiveness • From the client's point of view the project preparation phase is especially important. 	Customer segments <ul style="list-style-type: none"> • Municipalities – the owners of the many public buildings; • Other owner types – owners of the public buildings
	Key resources <ul style="list-style-type: none"> • Competence on value management and value configuration with sustainability criteria • Design team leadership • Competence for design for sustainable building • Competence in the use of stimulation and assessment tools 		Channels <ul style="list-style-type: none"> • All types of channels (direct, events, web portal, professional associations, etc) 	
Cost structure <ul style="list-style-type: none"> • Work costs - the main part of costs • Marketing • IT costs (new software) 			Revenue stream <ul style="list-style-type: none"> • Better competitive positions (possibility to offer the sustainable building expertise and competences in this field) 	

Advantages

The advantages are based on the potential to achieve a strong competitive position in relation to important customers. The advantages are also based on comprehensive expertise in sustainable building and thus good expertise is an important aspect that is valued by many clients although not especially interested in the overall concept.

Disadvantages

Disadvantages of the concept include the need to maintain (by the partner or through networks) a big number of specific design competences and simulation competences. The concept also requires in many cases that the actor is able to support the client to define targets for sustainable building.

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NewBEE-Wiki: www.newbee-wiki.eu.

4.6 SMEs acting locally / regionally

Introduction

As usually for SMEs which operate in the construction field, the regionally active construction SMEs are looking for a holistic coverage of the construction industry market, for

example business models which can be profitable by fulfilling a wide spectrum of clients' requirements.

The regionally active construction SMEs, have an increasingly need to be organised into networks or strategic alliances. This will answer to the business opportunities which require individual resources such as specific expertise, workforce or equipment. For widening the range of competences some of them enter even wider association such as e.g. German Facility Management Association (GEFMA)⁴.

Business model

One important and very good component of the business models in several SMEs acting locally/regionally is increasing orientation to the Green-Tech and sustainability issues.

The business model applied by the SMEs active at the local/regional market can be mapped to the conventional approach of Osterwalder and Pigneur (2010) as presented in the table 14.

Table 14 – Business model applied by the SMEs active at the local/regional market
(source: <http://www.newbee-wiki.eu>)

Key partners <ul style="list-style-type: none"> • Architects • Planners • Suppliers 	Key activities <ul style="list-style-type: none"> • Project financing • Planning, execution • Partnering • Project development • Project execution • Facility Management 	Value proposition <ul style="list-style-type: none"> • Service variety – completeness • One contact partner – One invoice – One warranty • Better living and functional environment • Ecological Policy 	Customer relationship <ul style="list-style-type: none"> • Business to end customer • Solution driven • Business to local/regional public institutions 	Customer segments <ul style="list-style-type: none"> • Regional/local clients • Private residential objects owners • Regional/local public objects managers
	Key resources <ul style="list-style-type: none"> • Professional expertise • Service expertise • Consulting/Planning/Execution • Dedicated equipment 		Channels <ul style="list-style-type: none"> • Local/Regional advertisements • Direct recommendations • Direct invitations • Contacts with other companies 	
Cost structure <ul style="list-style-type: none"> • Planning costs • Work costs; • Equipment costs 		Revenue stream <ul style="list-style-type: none"> • Guaranteed maximum price contract • Unit prices 		

Advantages

- Facilitated communications with key partners from the region including good knowledge of the available specific experts, material suppliers etc. are among the main advantages of this business model.
- Good knowledge of the local conditions/requirements for cultural heritage objects restoration and procedures for obtaining permissions for such projects are also emphasized as well as faster access to the calls for bids are further advantages of the business model.
- Good knowledge of the local funding possibilities and facilitated realisation of the payment for completed projects facilitates realisation of the projects.
- Lower costs for establishing and maintaining channels to the customers through spreading of good customer experiences in the confined area; ;Cheaper typical offers based on the realised region projects;

⁴ GEFMA (German Facility Management Association) accompanies the market development and market participants in facility management (FM). As a leading network of facility managers, the association represents more than 850 companies and organizations. At the same time GEFMA is the roof and engine for a joint conceptual framework, marketable standards and a modern image of facility managers. (www.gefma.de)

- Easier/faster issuing of the offers that fit the whole lifecycle of buildings because of higher awareness of the local climatic conditions, building typologies etc. is an additional advantage of this business model.

Disadvantages

- Low integration with raw materials manufacturers, which belong to the group of key partners, is among the main disadvantages of these business models.
- Possible missing of the specific services or competences due to the limited geographic area of activity – no possibility to find needed partner for special, state-of-the-art construction activity can be a significant problem, leading to the lower spectrum of business opportunities to answer.

References

NewBEE-Wiki: www.newbee-wiki.eu.

4.7 KVA case

Introduction

Architectural competitions are in general used in order to get a wide insight to future possibilities of a specific building or retrofit project and proposals with high architectural quality.

There are several types of architectural design competitions such as open competitions (international, national or regional), project competitions, idea competitions, student competitions. There can also be one stage or two stage competitions depending on the scale and complexity of the competition target. Procedures can be anonymous or cooperative. Also invited competitions are becoming quite common among commercial clients, whereas open competitions are used by public building owners such as municipalities. As the target setting of building projects and renovation cases become wider - in such a way that demanding objectives can be set on several performance targets which may also contradict with each other – the need for multi-objective design increases. Very ambiguous energy targets may be given and at the same time require high quality indoor environment together with very high architectural quality. To ensure that all objectives are considered intelligent solutions created, a wide expertise is needed. Collaboration for competition is a novel business model where the performing multi-disciplinary team consists of partners with untraditional competences. This is how both the architectural quality and the holistic technical know-how of sustainable and energy-efficient retrofitting solutions and innovative solutions for the life time of the facility can be achieved. This section describes a new model of working where several designers and consultants representing different design disciplines or expert areas do collaboration in order to create a comprehensive approach and better achieve the multi-objective targets.

Business model

The business model suits the projects where clients are seeking for large scale changes and up grading of technical service systems and spaces. A good location of the facility in question is often required; otherwise the project is not economically feasible.

The second stage, which is the actual design project after the competition, is more challenging. The main idea in this business model is that the same team will carry on with the project and produce the holistic design service for the facility retrofitting. In practice, the team might have to establish Project Cooperation for this. The team should be able to give a deeper value promise based on their value proposal in the competition stage. Value proposal cover the overall offerings each organisations of the team could produce. Value promise is a

part of offerings and tailored for the facility question and it is answering to the targets of the client. Value promise should be in core of the contract with the client and the team. Table 15 presents this business model applied in the KVA case.

Table 15 – KVA case Business model applied in the (source: <http://www.newbee-wiki.eu>)

<p>Key partners</p> <ul style="list-style-type: none"> • In the competition phase: network of independent actors • In the design phase: project cooperation 	<p>Key activities</p> <ul style="list-style-type: none"> • Gathering of the team • Activities and collaborative methods for co-design • Communication practices • Design concept development • Design concept visualisation • Methods for analysing alternatives and decision making in the design team level • Methods of decision making in the project level 	<p>Value proposition</p> <ul style="list-style-type: none"> • Total design and operational concept for EE retrofitting which covers life cycle of the facility 	<p>Customer relationship</p> <ul style="list-style-type: none"> • After completion phase relationship building and collaboration with the customer (client) and end customers is important. • Relationship stays active through the life time of the facility 	<p>Customer segments</p> <ul style="list-style-type: none"> • Professional facility owners • Municipalities
	<p>Key resources</p> <ul style="list-style-type: none"> • Professional capability and team skills • Culture of dialogue and reasoning • Design entry visualisation technology • Ambition for innovative solutions 		<p>Channels</p> <ul style="list-style-type: none"> • Channels for design procurement: Integrated project delivery method and any methodology which support strong design team integration and design iterations 	
<p>Cost structure</p> <p>As the services provided through the Team are wider than in the case of traditional design services the cost structure is also wide.</p>		<p>Revenue stream</p> <ul style="list-style-type: none"> • The revenue stream is based on multi-professional services and services for the life cycle phases of the building • Services for the owner /clients and services for end users 		

Advantages

The advantages are based on the more holistic and innovative end results which a professional multi-disciplinary team can provide. When the network matures also flexibility and agility are advantages.

Disadvantages

The disadvantages include strong resource needs for networking and in-depth communication, if the hit rate for winning competitions is low. It would be good to get invited to project competitions as a team. Contractual challenges affect the revenue shares, responsibilities and risks between the members of the cooperation.

References

Competition on retrofitting the Hippotalo building in Tampere was organized in Finland in 2013. The proposal Equilibrium, which was the outcome of a multi-disciplinary team, won the first price. <http://www.nordicinnovation.org/nordicbuilt>;
http://www.nordicinnovation.org/documents/newsletters/1304_ni_news_spring_lr.pdf

4.8 Max Bögl case

Introduction

As it turned out by the experience of executing construction projects, the conventional approach of “not or less” including partners into a project since its beginning was not feasible. The lack of collaborative, team-based working was more and more challenging for

all participants and thus, Max Bögl⁵ tried to foster its partnering approach and to include all project partners into the project execution at the very beginning of a construction project in order to maintain communication.

Main features of broad-based construction SMEs like Max Bögl are vertical integration and a broad product portfolio. As it turned out by the time, a positive evolution of this business model can be achieved by four basic preferences which need to be considered (extension of the targeted market/product segments, entry/expansion of niche segments, specialization on PPP and concessions, introduction of construction-related services) and can be categorized into three strategic fields (expansion of product portfolio/along value chain, specialization, geographical expansion)

It is important to consider these preferences as a decision of direction - pro additional growth or pro specialization. If this decision is made, several options are possible, whereas expanding growth means elaboration on additional market segments, expansion of product portfolio or higher area coverage. Specialization can be achieved by “one-stop-shop”- or “turnkey”- solutions. Besides these points it is important to highly exploit economies of scale and optimize overhead capacities. To support these activities and to achieve optimization, broad-based SMEs’ task is to capture niche segments particularly with different priorities and with a broad spectrum. Green technology/Sustainable Property Management as well as the adoption of Public Private Partnership (PPP) projects have been considered by broad-based SMEs as a lucrative field of activity also. In order to optimize overhead capacities and to exploit economies of scale effectively, Max Bögl takes advantage from the benefits of the partnering approach, i.e. the division of labour, where complex processes can be decomposed into simple, easy to repetitive activities.

Business model

The Max Bögl’s business model can be mapped to the conventional approach of Osterwalder and Pigneur (2010) as shown in Table 16.

Table 16 – Business model applied in the Max Bögl case (source: <http://www.newbee-wiki.eu>)

Key partners <ul style="list-style-type: none"> • Architects • Planners • Supplier • RTD • Governmental bodies • ESCOs 	Key activities <ul style="list-style-type: none"> • Project financing • Planning • Execution • Operation • Partnership • Project development 	Value proposition <ul style="list-style-type: none"> • Service variety • Service orientation • Service performance • Cooperation • Value management • Ecological Policy • Facility Management 	Customer relationship <ul style="list-style-type: none"> • Relational • Business to business • Communities VBES⁶ • Transactional • Business to end-customer • Solution driven • Business to public institutions (i.e. PPP projects) 	Customer segments <ul style="list-style-type: none"> • International clients • National clients • Regional clients • Local clients
	Key resources <ul style="list-style-type: none"> • Professional expertise • Service expertise • Management Expertise • Consulting/Planning • Dedicated equipment 		Channels <ul style="list-style-type: none"> • Magazines • Brochures • Fairs • Press reports • Declarations of performance 	

⁵ Founded by Max Bögl in 1929, Max Bögl Group, headquartered in Neumarkt, Germany, is looking back on a successful company history of more than 85 years. With annual sales of more than 1.6 billion Euro and about 6,000 highly qualified employees, Max Bögl not only ranks among the top 5 of Germany's biggest construction companies: managed by the third generation of the family, Max Bögl Group is Germany's biggest privately owned construction company, too. (<http://max-boegl.de>)

⁶ German Associations for Education

<p>Cost structure</p> <p>Capital expenditure (CAPEX)</p>	<p>Revenue stream</p> <ul style="list-style-type: none"> • Guaranteed maximum price contract • Unit prices / Generalization • General contractor and Contractor – contract • Insurances and financial services
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Advantages

Broad-based SMEs have the advantage of good regional and national networking and much power to bind local commodity producers. Through this, the existing access to subcontractors is given also and due to very high equity capital ratio this kind of SMEs has got the opportunity to expand internationally/nationally and to get access to PPP projects. If there are fluctuations in demand those SMEs can compensate these by a systematic risk management and product diversity.

Disadvantages

A broad-based construction SME has to face several challenges during its work (e.g. there is much overhead which has to be financed). Moreover it is a challenge to overcome the balancing act between local autonomy and central control. In competitive situations with similar construction companies like specialists, a broad-based construction SME as a generalist has to deal with the efficiency of those highly specialized companies. During construction projects there exists the risk of scarcity of resources (especially personnel and subcontractors) if own capacities for project executions and orders are not sufficient simultaneously.

References

<http://max-boegl.de>

<http://www.newbee-wiki.eu>

4.9 Prefair case (Hochtief Germany)

Introduction

In today's construction industry a movement from conventional competition and contract models towards new partnership, collaborative business models can be observed.

These partnership business models comprise nowadays management and manufacturing methods and correspond more to real businesses in the construction industry. This progress of the market within the construction sector leads to a usage of new business models also in order to overcome traditional price-driven competition towards a more collaborative construction industry working environment and a value-driven competition. In order to improve the collaborative work between all participating project partners the Hochtief AG introduced the PreFair business model in 2003 and caused a paradigm shift in the construction industry. Within the PreFair business model the entire know-how and the potential of innovation of all project part-ners are concentrated in one team at the earliest date. The planning process is then deployed in a holistic approach.

Business model

Table 17 presents the PreFair model.

Table 17 – Business model applied by Hochtief (source: <http://www.newbee-wiki.eu>)

Key partners <ul style="list-style-type: none"> •Architects •Planners •Supplier •ESCOs 	Key activities <ul style="list-style-type: none"> •Risk, safety management •Planning management •Expertise in structural design •Expertise in technical building services •Expertise in construction, related issues and processes •Budget development and management •Regular progress report •Development of contractual mode •Integration of customer network into planning •Needs and feasibility analyses •Financing concepts •Site development •Architectural selection •Facility management 	Value proposition <ul style="list-style-type: none"> •Early cost influence •Early risk management •Project transparency •Assured budget •Scheduling and quality •Fact project completion •Reduce risk of claims •Lower operation costs •Lower warranty costs •Support of acquisition efforts 	Customer relationship <ul style="list-style-type: none"> •Relational •Business to business •Communities VBEs •Transactional •Business to end-customer •Solution driven •Business to public institutions (i.e. PPP projects) 	Customer segments <ul style="list-style-type: none"> •International clients •National clients •Regional clients •Local clients
	Key resources <ul style="list-style-type: none"> • Professional expertise • Service expertise • Management Expertise • Consulting/Planning • Dedicated equipment 		Channels <ul style="list-style-type: none"> • Personal approach • Fairs • Press reports • Advertisements • Folders 	
Cost structure Capital expenditure (CAPEX)		Revenue stream <ul style="list-style-type: none"> • Cost-plus-fee-contract • Maximum cost contract • Package price contract • Budget contract • Financing 		

Advantages

One of the main advantages of the PreFair business models is the high flexibility in the contract selection (i.e. alternative price models). The offered price models – Maximum price contract, Budget contract, Cost-plus-Fee contract and Lump-sum Contract – allow clients to select the optimal one for them. The CI company is responsible for prices, deadlines, and quality. At the end of the planning performed in the preconstruction phase, the company names the estimated budget, which is considered binding. Furthermore, the planning itself is improved by the usage of professional planning management and innovative technologies; the building goal is also well defined. These aspects reduce the risk of planning gaps which can lead to higher costs and longer building periods in the construction phase. The planning and construction periods are minimized also by the partnering model applied to all the involved actors, the professional coordination and the synchronization of the planning processes.

Disadvantages

This business model has a limited applicability for smaller customers/contracts and SMEs. There is no possibility to combine the steps from the two phases.

Another disadvantage of PreFair is that in 2013, the Hochtief AG decided to specialize towards the four major fields of transportation infrastructure, energy infrastructure, social and urban infrastructure as well as towards the contract mining business meaning that the Hochtief AG tries not to focus on covering the entire value chain any more per se. In fact, these business areas could not be addressed by Prefair anymore, because one of Prefair's main ideas is the full value chain coverage.

References

<http://www.hochtief.ro>

<http://www.hochtief-construction.de>

<http://www.newbee-wiki.eu>

4.10 Bilfinger SE case

Introduction

The recession phase that has been plaguing the construction industry in the last years means that relying on traditional business models is no longer sufficient. Furthermore, the general lower demand for construction, coupled with the increasing amount of competing offers in the planning and implementation of projects, has a negative influence on the recovery of traditional business models.

Until now, Bilfinger Berger AG⁷ has used the following types of business models, grouped by category:

- Price Models: Flat rate pricing; Guaranteed Maximum Price (GMP) agreement
- Contract Models: General contractor and full-service general contractor; Construction Management contract; Building team.
- Performance Models: Project development; Financing models; Operator models; Facility Management.

Business model

Bilfinger SE business model can be mapped to the conventional approach of Osterwalder and Pigneur(2010) as shown in table below.

Table 18 – Business model applied by Bilfinger SE (source: <http://www.newbee-wiki.eu>)

Key partners <ul style="list-style-type: none"> •Architects •Planners •Supplier 	Key activities <ul style="list-style-type: none"> •Project financing •Planning •Execution •Operation •Partnering •Project development 	Value proposition <ul style="list-style-type: none"> •Service variety •Service orientation •Service performance •Cooperation •Ecological policy •Facility management 	Customer relationship <ul style="list-style-type: none"> •Business to business •Business to end-customer •Solution driven •Business to public institutions (i.e. PPP projects) 	Customer segments <ul style="list-style-type: none"> •Regional/local/commercial clients •Regional/local public objects managers (office buildings, restaurants, large apartment complexes, etc) •Special facilities •General construction
	Key resources <ul style="list-style-type: none"> • Professional expertise • Service expertise • Management Expertise • Consulting/Planning • Dedicated equipment 		Channels <ul style="list-style-type: none"> • Brochures • Fairs • Press reports • Declarations of performance 	
Cost structure N/A			Revenue stream <ul style="list-style-type: none"> •GMP contract •Unit prices / Generalization •General contractor and contractor – contract 	

⁷ The previous name corresponding to the period 2001-2010

Advantages

Price Models:

- Flat rate pricing can be done with relatively little effort and time invested by the company. Furthermore, since there is a solid legal basis dealing with this type of pricing, this type of price model comes with a strong legal safety net.
- Due to the nature of a GMP Agreement, the GMP Partner can increase its profits by applying its know-how. For the construction owner, the advantage lies in the price certainty from an early stage of the project, as well as shorter project duration, due to the early involvement of the contractor.

Contract Models:

- General contractor and full-service general contractor: the client has only one contact point within the whole team, making communication easier.
- The Construction Management: usually leads to smaller building costs, since there is traceability and involvement of actors across all phases of the project. Bilfinger uses a special form of the Construction Management Contract, namely Together in Joint Partnership model.
- Project work in a “Building team” format aims to reduce the project duration, improve the quality of the works, as well as minimizing the costs.

Performance Models:

- Operator models: constructions made under such models are not built on tax payer money; furthermore, such projects are allegedly performed more economically, based on the assumption that the investors are aiming at an optimized cost across the whole life cycle of the project.
- Facility Management: by integrating planning, control, and management of buildings, installations, and establishments, the use of these models improves their usage flexibility, work productivity, and return on assets.

Disadvantages

Price Models:

- Flat rate pricing: it can only be used in projects for which the volume and the aims are clearly defined, and no changes are expected over the course of the project.
- GMP agreement: reduced competition through the direct award of the project. Furthermore, the GMP partner must always be a general contractor / full-service general contractor / construction manager, which might be disadvantageous in certain cases.

Contract Models:

- General contractor and full-service general contractor: in such cases, the building owner might run the risk of having only a limited influence over the project's course.
- Building team: this model is mostly used for private clients, since its application for public clients has generally led to suboptimal results from a competitive point of view.

Performance Models:

- Operator models: the financing for projects backed by such models is shifted from tax money to user fees. Furthermore, the investor must perform the project through expensive financing.

References

<http://www.bilfinger.com>

<http://www.newbee-wiki.eu>

5 PROPOSED NZEBR BUSINESS MODEL

As a challenge for interested stakeholders, Table 19 below provides a proposal for NZEBR business model based on the results of the COHERENO project and the best practices in the field. This business model is only a general proposal, as starting point, which needs to be improved with specific elements regarding country conditions and business specific.

Table 19 – Proposal for NZEBR business model

<p>Key partners</p> <ul style="list-style-type: none"> •Architects •Planners •Supplier •Energy auditors •ESCOs •Banks 	<p>Key activities</p> <ul style="list-style-type: none"> •Marketing •Energy audit/building inspection •Planning •Partnering •Project financing •Apply for subsidies •Project management •Project development •Execution •Operation 	<p>Value proposition</p> <ul style="list-style-type: none"> •Energy performance level •Specific energy saving targets •Satisfied owners and tenants •Full service renovation, including financing services •Service performance •Cooperation •Ecological policy •Facility management 	<p>Customer relationship</p> <ul style="list-style-type: none"> •Dedicated personal assistance 	<p>Customer segments</p> <ul style="list-style-type: none"> •Multi-family buildings built before 1990 – public or private types
<p>Cost structure</p> <ul style="list-style-type: none"> • Costs involved in NZEBR (labour, material, equipment, installation, etc) • Marketing costs • Cost for post-renovation commissioning and information material to educate the owners about operation and maintenance of NZEB 	<p>Revenue stream</p> <ul style="list-style-type: none"> • Customer payment • Combination of different financing sources 			
<p>Key resources</p> <ul style="list-style-type: none"> • Project managers • Energy analysis tools • Professional expertise • Service expertise • Consulting / Planning / Execution • Financial supports (Subsidies, grants, etc.) • Dedicated equipment 	<p>Channels</p> <ul style="list-style-type: none"> • Brochures • Mass media and website • Fairs • Press reports • Declarations of performance 			

6 COUNTRY SPECIFIC ANALYSES OF BUSINESS MODELS

6.1 Finland

Most relevant business models

Of the business models described in this report, the following are considered most relevant for the Finnish market:

1. *SME cluster collaboration for large real estate retrofitting*. In case of Finland this is considered to be the best business model for apartment houses. An advantage of this model is that the cluster of the SMEs enables to carry out the renovation in phases so, that not all the renovation actions are made in the same time. In Finland this is important, because most of the block houses are in private ownership.
2. *TEA case* would also be suitable for Finnish conditions. In the private owned block houses the well-defined co-operation with project manager and principal designer would be effective when working together with boards of housing corporations
3. In single houses *One-Stop-Shop models* fit well for Finnish conditions because they are created for single houses typical in Finland. Two of them do not include financing which is not a big problem in Finland, because bank loan is the typical way to finance renovations.

Further needs

The business canvas developed in the COHERENO project and described in section 5 above has been analysed for the Finnish conditions. The results are presented below.

Customer segments

This customer segment is relevant in Finland, but the largest amount of buildings with need of renovation and especially energy renovation are built during 1960-1980. Energy renovations are as relevant in other types of buildings as in residential buildings such as schools, but these are not primary objects of NEZER: outside NeZeR.

Value proposition

These value propositions are relevant in Finland. In addition the *indoor environment* is relevant.

Channels

Social media would be inserted in channels, because it is a strong marketing media in Finland beside other electronical medias. Declarations of performance might be good channel when discussing with professional building owners, but maybe not in case of housing corporations. Also development of energy saving games might be fruitful.

Customer relationship

This is a good way to take care of customer relationships. Another important way is *after-sales service* if it is not included to dedicated personal assistance. Partnering with customers would be a way to ensure working solutions and sufficient maintenance (for example Public Private Partnership).

Revenue stream

One part of the revenue stream might be the principal of ESCOs to get the part of the revenue stream from energy saving of the buildings. However, ESCOs are not very large operators in renovations Finland. Also authority supporting loans, subsidies/incentives and tax reductions are commonly used.

Key resources

Consultation from energy companies and expertise of construction companies might be inserted here

Key activities

These describe key activities very well. The project financing could be define more accurate e.g. Project financing *by using different financing instruments.*

Key partners

The role of ESCOs is not very significant in Finland today, but ESCOs can however be in the list. *Energy companies* are significant partner especially when renovations are made in the buildings with district heating

Cost structure

The planning and other preparation costs could be inserted here. Also the looking after the customer relationships will cause costs, but it might be, that these are includes to marketing costs. Also maintenance costs energy costs and resale value must be taken in account when calculating Life Cycle Costs!

Some reflections can be found above. One “Finnish” thing is, that apartment houses are typically owned by residents and this should be taken into account also in renovations and specially when marketing them. The decision-makers need a good quality and clear information.

Another issue is that none of the business models takes into account the living conditions during the renovation. This might be one possibility to stand out.

6.2 Netherlands**Most relevant business models**

For the Dutch situation three descriptions of business models as the most relevant for NZEBR have been chosen:

1. *SME cluster collaboration for large real estate retrofitting*
2. *Sustainable design and building, business concept*
3. *One stop shop business model*

Explanation: For the customer segment of social housing organisations (SHO) one of the crucial factors is the efficiency of the delivery method in order to reach near zero energy performance.⁸ The traditional approach is mostly ‘step by step’ and ‘measure by measure’ in order to reach moderate ambitions. For higher ambitions, a higher efficiency of delivery methods is needed. We can see a few guiding principles:

- extending the timeframe of involvement and contractual relationship (Design Build and Maintenance);

⁸ See more information: <http://abe.tudelft.nl/index.php/faculty-architecture/issue/view/426>

- using performance-based specifications with realistic but ambitious minimum requirements;
- acting in competitive tender procedures and dialogues;
- guaranteeing performance

These principles are addressed in business models 1 and 2 as mentioned above.

For the customer segment of private owners the ‘one stop shop’ business model is most promising. Private owners are seldom experts in energy-efficiency, so holistic expertise from different skills is needed. The ‘single point contact’ in combination with the ‘full service offer’ makes the one stop shop easy to understand and approachable for private owners. However, this approach is still in an early stage in the Netherlands.

Further needs

In the end, it often is ‘all about the money’?! For social housing organisations and private owners financing can be an important obstruction for energy renovation. The existing business models are still developing on this point. The ESCO business model could offer answers to this problem. However, ESCO’s are not common practice yet and not widely known for offering holistic energy renovation propositions. The feasibility of the ESCO business case is (probably) complex when using high profitability demands and commercial incentives. Solution directions are:

- Non-profit ESCO’s (with lower profitability demands);
- Governmental subsidies (or specific regulations on financing of energy renovation);
- Always combine energy measures with other high quality measures (new kitchen, extra room etc.) in an offer so that ‘costs and quality’ are more balanced in the eye of clients.

6.3 Romania

Most relevant business models

The most relevant business models in Romania could be considered the following:

1. *SME cluster collaboration for large estate retrofitting;*
2. *SMEs acting locally or regionally;*
3. *Max Bögl case.*

The first two business cases are often used on the thermal rehabilitation projects of multifamily buildings based on the main advantages of their system and maintaining a low cost level. But, taking into consideration that these types of projects are co-financed from public funds, usually the clients are public authorities and to define the project leader could be difficult and could delay the project progress.

Several Romanian companies adopted the German business models, the main reason being that many of them act on the construction market from Romania and Germany.

Further needs

The majority of the projects for increasing the multifamily building energy performance are included in the national programme co-financed by central and local budgets. On this market (multifamily buildings) there is a great need for development of other successful business models that could lead to the accelerating of these projects. One such example is the ESCO business model. In this way, ROSENC Timisoara (a RES cluster) together with Timisoara Municipality, COLTERM, CONSILIUM and FALT (Association of the inhabitants from Timisoara) has demonstrated the feasibility of the ESCO business model on the specific

market in Timisoara. The result of this study was the establishment of the ESCO-TIM Reabilitari Locuinte, i.e. the first ESCO company specialised on increasing the energy performance for multifamily buildings placed in Timisoara.

6.4 Spain

In the case of Spain, Near Zero Energy Renovations are far from the European targets. On the one side, the low demanding climate conditions and the lack of awareness and, on the other side, difficulties in the renovation process due to social management arisen from the private ownership of the dwellings lead to this situation. Nevertheless, big efforts are undertaken by the administration and companies to promote deep renovation. The administration is allocating special funding for energy renovation while companies are searching an adequate business model which can push the renovation. Furthermore, the construction sectors is completely dedicated to this task with the scope of boosting the renovation market and recover the activity lost in new construction.

Most relevant business models

Up to now, although there are not numerous cases, the *ESCO business model* has been the most widely used. It is an advantageous model since it allows to measure whether energy objectives have been achieved. Nevertheless, it is not a feasible model in several situations. For instance, when the original dwelling has no heating or when the change of use leads to more demanding energy conditions.

As most of the building stock is multifamily buildings or blocks of apartments, other business models such as One-Stop-Shop are not frequently used.

Due to the private ownership of the Spanish dwellings, there are three other business models that could be suitable to face a deep renovation:

- Although it is not frequent, *SME cluster collaboration for large real state retrofitting* could be a suitable business model. The adaptability of the cluster to each project is a positive aspect which can help to answer client requests in an affordable way.
- For tailored renovation projects, *TEA case* – Design company's business concept for energy efficient retrofitting based on customer profiling and management of initial building data – may also be suitable. However, excess of cost due to the resources needed for the initial analysis must be carefully tackled.
- *SMEs acting locally or regionally*. This business model promotes local SMEs activities and give owners confidence in the designers due to closeness of the companies. This could facilitate social management.

Further needs

Financing is an utter for private owners to undertake energy renovation. The following specific financing needs can be underlined:

- Municipalities should promote deep renovation and pave the way by means of funding and get some exemplary cases. A global strategy and a corresponding financing model should be developed and public-private collaboration is necessary.
- Stakeholders should change their mind and help with the financing of the project, reducing their profit or suggesting more collaborative schemes. The national Basque construction cluster for instance is trying to create an ESCO.
- Another possible financing scheme is to construct added value solutions. E.g. the creation of additional new living spaces during the renovation process so that the profit from the sale helps with the financing. This scheme works when the new living

spaces are enough in terms of number or, on the contrary, they have added value (e.g. they are luxury flats).

6.5 Sweden

In Sweden, the business model probably most commonly used for energy efficiency improvement of public owned buildings is the *ESCO business model*, especially Energy Performance Contracting (EPC). Numerous EPC projects have been performed in Sweden, although the demand has dropped significantly the last years due to e.g. low energy prices and termination of a grant for renovation of public buildings. EPC is a business and cooperation model for energy efficiency improvement measures which promotes investments in energy saving measures financed with guaranteed future energy savings. In this business model it is up to the client to set the requirements in the procurement. If the client requires NZEBR then this should be achieved by the supplier. Likewise if the client requires RES it should be included. However, since one aim of EPC is to reduce energy costs, it may not always be possible to reach as low as near zero, as the measures required could be too costly.

The ESCO business model has so far not been used to a large extent in renovation of private owned buildings. However, there is now an ongoing research project financed by e.g. the Swedish Energy Agency that aims at developing energy service models for private owned multifamily buildings.

Energieffektiviseringsföretagen⁹ (EEF) has provided a business model in which they offer concrete measures to property owners, industries and others. In this business model, the supplier of energy efficiency products, services and/or systems propose energy efficiency measures for a certain building within their area of expertise i.e. a ventilation expert would for instance propose measures on e.g. installation of heat recovery. Thereafter an EEF-coordinator compiles the proposals, from the different suppliers, into a package of measures to the owner of the building. Thus, with the help of the EEF-coordinator's network the customer is provided with a review of the building and its technical installations and an overall energy audit with proposals on measures, investments and potential savings.

The purpose of this business model is to simplify for the members of EEF to carry out energy efficiency assignments for property owners and industries. Although this business model is not impartial (as you choose from the EEF firms), this does not necessarily have to be problem as the coordinator has a responsibility to ensure that measures lead to improved energy efficiency. For instance, the municipalities' energy and climate advisers are impartial in their work, i.e. they are only allowed to propose measures (to e.g. a housing cooperation) and may not recommend e.g. a specific company to implement the proposed measures. This becomes a problem because the housing cooperations are not aware of whom to turn to for conducting the proposed measures. The EEF business model solves this problem by providing both proposals on measures and implementing the measures.

Most relevant business models

Of the business models described in this report, the following are considered most relevant for the Swedish conditions:

1. *ESCO business model*. This is probably the most commonly used business model for energy efficiency improvement of public buildings. See further explanation above.

⁹ "Energy Efficiency Companies"

2. *SME cluster collaboration for large real estate retrofitting*. This model could be suitable for energy efficiency improvement of private owned buildings. The reason for this is that the renovation may be done in phases.
3. *TEA case*. The concept is proved for Finnish conditions and could also fit Swedish conditions especially for multifamily buildings owned by housing corporations. An external partner helps identify main motives, targets and expectations of the customer.
4. *One stop shop model* could be relevant for smaller private building owners such as private single house building owners.

Further needs

From a discussion with the Municipality of Stockholm, we conclude that it is imperative to complement existing business models with Life Cycle Cost (LCC) to promote NZEBR and RES. LCC is a method that aims to help decision makers (e.g. designers or managers), assess the total cost of ownership of e.g. a building. When a decision is to be made whether or not an energy efficiency investment is worthwhile, the payback method is commonly used, i.e. a method that calculates the number of years for e.g. an energy efficiency project to recover the cost of the investment.

In contrast to the LCC method, the payback method neglects important aspects such as operating costs, energy prices, discounting etc. For example, it is much more expensive to install LED bulbs compared with incandescent bulbs, but as the LED bulbs have a long life and high energy efficiency they are more profitable, which the Payback method disregards. When implementing energy efficiency measures, it is important that it allows for comparisons of options and by not considering aspects as operating costs, energy prices, discounting etc. it will be difficult to reach as low as near zero without methods such as LCC.

7 CONCLUSIONS

The increasing implementation of NZEBR projects could lead to significant energy savings and GHG emissions reduction. At the same time NZEBR projects involve a diversity of specialties, expensive technologies and materials that can ensure these results. The development process of NZEBR projects needs to find the optimal way between energy advantages and financial and economic limits in order to allow acceleration of NZEBR initiatives and the strengthening of the national NZEBR markets. This goal can be achieved based on a well prepared and interested business environment in the renovation field.

This report has collected and analysed several successful business models which operate in the whole construction field, also besides the building renovation area. Well known international and national projects have been selected and analysed. These cases cover a wide range of business actors from different countries and could be a support for interested stakeholders and also a motivation to develop a business in the NZEBR field.

The report also involves a short analysis of relevant business models for NZEBR in the participating NeZeR countries: Finland, the Netherlands, Romania, Spain and Sweden. The conclusion from these country specific analyses is that the conditions and challenges vary between different countries. General conclusions are that deep renovation of private owned (multifamily) buildings require other business model concepts than public buildings. For private buildings several of the countries have identified the *One Stop Shop model* and the *TEA case* as relevant business models. For public buildings the relevant business models vary more between the different countries. For example, the ESCO model has been widely used in Sweden and Spain, whereas it is not very common (yet) in the other countries.