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PROJECT FINAL REPORT

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Project acronym: NEWBEE

Project title: Novel Business model generator for Energy Efficiency in construction and retrofitting

Funding Scheme: EeB.NMP.2012-3

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[1] Usually the contact person of the coordinator as specified in Art. 8.1. of the Grant Agreement.

[2] The home page of the website should contain the generic European flag and the FP7 logo which are available in electronic format at the Europa website (logo of the European flag: http://europa.eu/abc/symbols/emblem/index_en.htm logo of the 7th FP: http://ec.europa.eu/research/fp7/index_en.cfm?pg=logos). The area of activity of the project should also be mentioned.

4.1 Final publishable summary report

4.1.1 Executive Summary

The increasing cost of traditional energy sources and the availability of emerging building technologies in lighting, heating, ventilation, air conditioning, insulation, energy monitoring as well as integrated renewable energy technologies and Building Information Management (BIM) are expected to increase the global market for low carbon solutions. However, together with technological development new financial, organizational and social innovation enablers are required to leverage the transformation towards more sustainable buildings and cities. In particular, the introduction of new energy performance based business models can significantly accelerate stepping up the adoption of energy efficient solutions through the creation of cooperative and collaborative business networks. In the case of the construction sector, the challenge for a successful implementation of these business models can be considered closely linked with the involvement of the entire value chain. That is to say, there won't be a real adoption of these business models unless every stakeholder involved in the specific construction project commits to their adoption. This is a challenging task. While large companies and technology providers can relatively easily adopt the know-how and apply new innovative materials, this is not the case for the vast majority of small and medium enterprises. These enterprises have very specific knowledge in their field and they are not used to truly collaborative work with other SMEs. They focus on determined construction activities with low chances to apply innovative concepts or solutions.

The development of collaborative business networks allow an early involvement of all relevant value chain stakeholders (including building owners) in the retrofitting process supporting the development of new business models through the provision of highly advanced and systematic access to competitive knowledge related to the best available technologies, materials for retrofitting and win-win financial schemas. In this complex world of construction and retrofitting, the information flow is not optimally achieved between the different stakeholders taking a role in the process.

This is even more complex if a multidisciplinary approach is required although this is the real situation in most of the cases. For this reason, innovative methodological and software solutions, affordable for SMEs, which comprise the majority of Europe's building industry, are required to support new forms of business networks, enabling the development of new business models aimed at accelerating adoption of new energy-efficient solutions.

Shortly summarized, NewBEE provides solutions to the two key problems the SMEs in construction sector are confronted with:

1. SMEs need a promptly and ubiquitous **access to competitive knowledge** in order for them to adapt to the increasing requirements for knowledge based processes execution (including retrofitting) and also to accelerate the application of emerging technologies. The adaptation will ensure, on the one hand, higher satisfaction of building owners and, on the other hand, a reduction of energy consumption to comply with forthcoming local and regional environmental requirements.

2. The other key problem is to **establish new organizational and business models** within the construction sector as a seamless alliance of value chain stakeholders, in order to compete with big contactors, providing a turn-key solution to the end user (building owner).

4.1.2 NewBEE Context and Objectives

The objective of the project was to develop the NewBEE system enabling SMEs to generate performance based Business models for energy-efficient construction works with special incidence in buildings retrofitting.

The main targeted features of the NewBEE system were as follows:

- Support to identify the best retrofitting technology adapted to each retrofitting project.
- Support to identify a business opportunity.
- Upon a business opportunity detection/development, easy configuration / adaptation / implementation of new business models based on regional specificities (climate, legislation, etc.) and on building/district typology
- Calculate risk/value distribution across the value chain and promotion of win-win public and private financing models e.g. through White Certificates
- Advise to develop new business opportunities
- Store and re-use the apprehended knowledge.

Following picture depicts the NewBEE Concept:

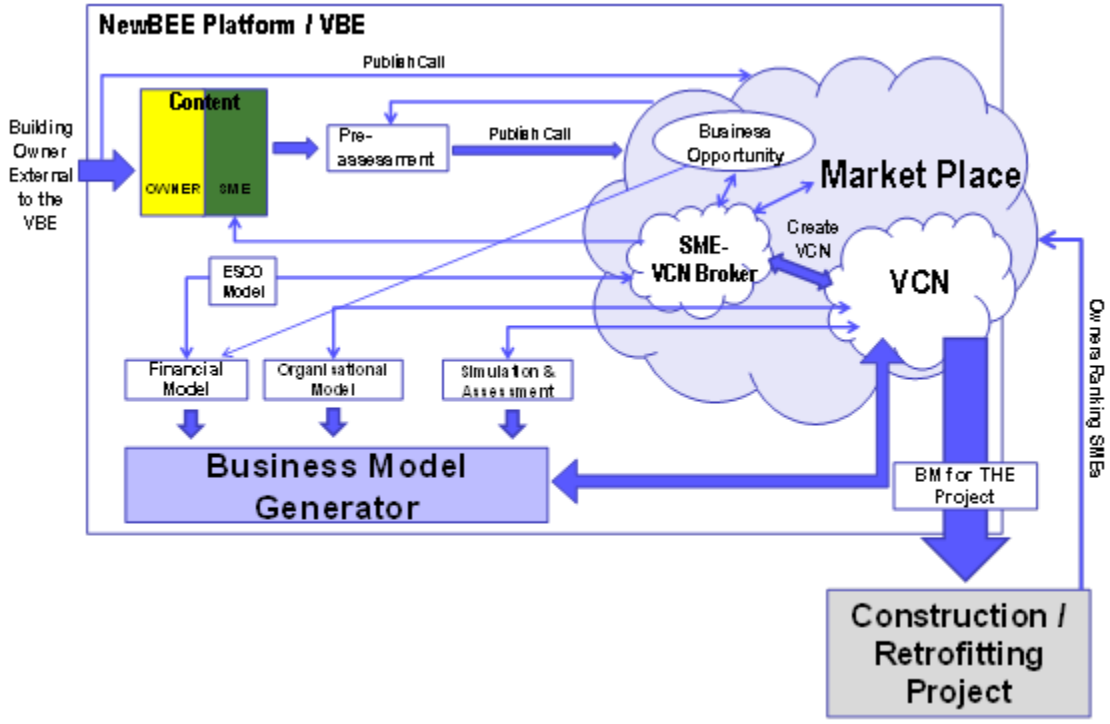


Figure 1: NewBEE Concept

NewBEE aimed at offering innovative results in the form of:

- **Methodology**, addressing organisational guidelines regarding the shift to the new virtual network oriented working paradigm, as well as a high-level overview of the processes involved in the operation of the ICT platform: joining the NewBEE Virtual Breeding community (also known as market place), answering to business opportunities, selecting the best retrofitting technologies, and deploying business models. The methodology should also comprise elaboration of an optimal business model based on technological and financial pre-assessments including among others also ESCOs best practices.

- **ICT platform**, including services for virtual networks (market place) set-up, collaborative knowledge management, selection of the optimal technology for energy efficient buildings retrofitting, pre-assessment of different technology/financing opportunities combinations from the point of view of the building owner and from the point of view of the SME (profitability), and business model generation; and comparison of the potential of different refurbishment technologies with the help of energy performance assessment tool. These services should provide support in the realisation of cost and energy efficient construction works in the specific area of the built stock refurbishment.

The NewBEE project's goal is to develop and validate an ICT solution enabling SMEs to generate new performance-based business models for cost and energy efficient construction works, with special emphasis on retrofitting.

NewBEE Methodology

As a basis for realisation of the NewBEE system, a methodology has been developed to address related RTD and industrial needs such as:

- Establishing of business networks within the construction sector as a seamless alliance of value chain stakeholders in the energy efficient retrofitting to complete projects which override resources of individual companies
- Advising and support to identify or develop new business opportunities
- Identifying and (easy) configuration/adaptation/implementation of new business models based on project regional specifics such as e.g. building/district typology, usually applied technologies, legislation, local/regional financial opportunities, etc.
- Development and setting-up of processes supporting the new business models
- Access to competitive knowledge in or for retrofitting SMEs to enable them to adapt to the increasing requirements for knowledge based process execution

The main users of the NewBEE methodology are retrofitting SMEs, including different expert companies and supporting RTD performers.

The topics dealt within the NewBEE methodology are:

- Collaborative Working Environment forms i.e. Virtual Networking forms – Virtual Breeding Environment (VBE, also called the market place), Virtual Collaborative Networks (VCN), their establishment, relationships among the participants and organisational/human and legislative issues within networks
- Functionalities provided at a VBE: Searching for partners appropriate for specific projects, publishing of calls for building renovation – building owner, identification of a business opportunity – construction industry SME
- Rough Pre-assessment procedure for quick estimation of the benefits from an energy efficient retrofitting project using basic building characteristics and available information on the financing opportunities. The pre-assessment comprise identification of the energy saving potential(s), by applying optimal retrofitting technologies, optimal financial models (performance based contract), construction/retrofitting processes (stages) according to the building type(s)

- Identification of business opportunities in terms of technical suitability, available resources and profitability
- Energy Efficient Services (EES), seen as services for supporting each of the processes (stages) of the work performed along the energy efficient buildings retrofitting, in the collaborative networks, where the detailed cost / benefit balance will be calculated for each of the selected retrofitting technology etc.
- Description/identification/development of New performance based Business Models, including stakeholders' network models description and financial models
- Methods for knowledge acquisition/collection, saving and structuring, for optimal operation of the networks using the NewBEE System. This knowledge should comprise retrofitting related methods, (e.g. energy auditing and efficiency assessment, methods for identifying building typologies, energy saving potentials) retrofitting technologies (for walls/facades, windows, lightning), retrofitting financing (grants, loans, ESCO), best practices collected from different sources, etc.

NewBEE ICT Platform

The NewBEE web-based ICT platform offers the users the following functionalities (user requirements):

1. Identifying (and/or creating) new business opportunities
2. Rough assessment of the technical feasibility and profitability of a retrofitting project
3. Setting up Virtual Collaborative Networks within a Virtual Breeding Environment (also called market place).
4. Easy configuring/adapting/implementing new business models based on regional specificities
5. Storing and reusing knowledge
6. Identifying most suitable methods/processes to assure an improved life-cycle energy efficiency

In order to address these functionalities, the NewBEE consortium developed a web-based ICT platform including the following services, which address the functionalities above mentioned:

- Network Setup Services
- Collaborative Knowledge Management Services
- Pre-assessment Tool
- Simulation & Assessment Tools
- Energy Efficiency Services
- Business Model Generation Services

Furthermore, a Common Knowledge Repository will be the underlying layer for managing the data in the system.

Following table shows the relation between the NewBEE functionalities (or user requirements) and the NewBEE ICT services developed:

Table1: Functionalities of the NewBEE ICT platform addressed by NewBEE services

NewBEE Services	Funct 1	Funct 2	Funct 3	Funct 4	Funct 5	Funct 6
Network Setup Services	X		X			
Collaborative KM Services					X	X
Pre-Assessment Tool		X				X
Energy Efficiency Services				X		X
Simulation & Assessment Tools		X				X
Business Model Generation Services		X		X		

4.1.3 S&T Results/Foregrounds

The main S&T objectives for the NewBEE project are the following:

- Provision of new SMEs centred business models for leveraging Energy Efficient building and district retrofitting
- Stakeholders' value chain management; early involvement of all actors from the very beginning of the energy retrofitting process
- Building performance management through sustainable retrofitting processes; energy performance and life cycle impact management through the retrofitting process
- A web-based ICT decision support tool for preliminary assessment of possible retrofitting solutions connected to different business models and operation models
- Inclusion of the knowledge, tools, and understanding of Energy Service Companies (ESCOs), which will be part of the decision support tool
- Involvement of public and private owners
- Best practices assessment from other European, national or regional projects from the sector and other industrial sectors

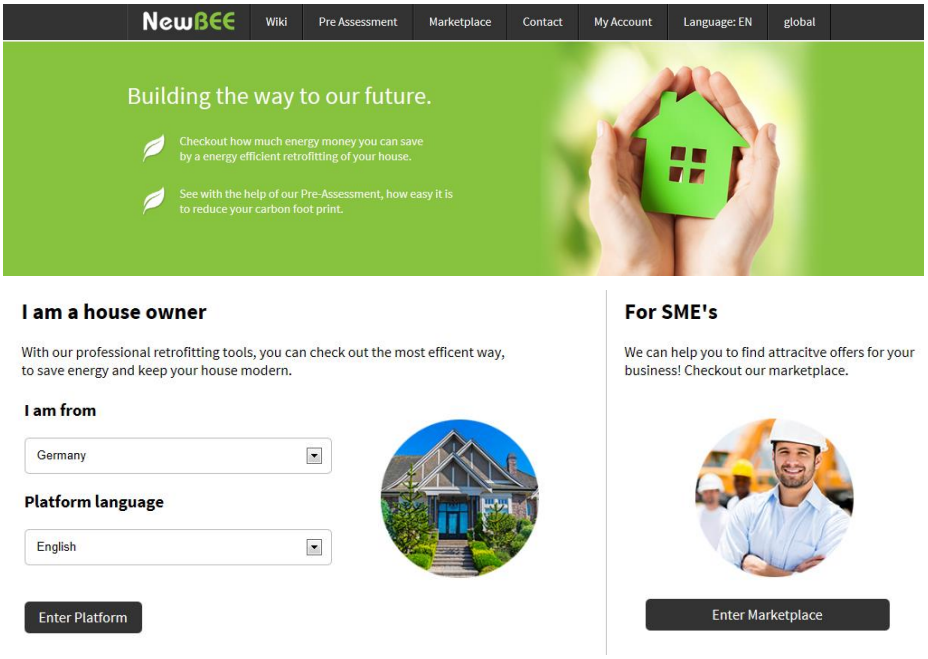
The NewBEE platform shows information about the aspects that are relevant to be considered in a retrofitting project. It is composed by the following six different tools:

- Pre-assessment tool
- Financial calculation tool
- Market Place tool
- Energy Performance Assessment tool (E-PASS)
- WIKI based Knowledge Repository
- Business Model Assessment tool

The NewBEE platform has two groups of users:

- **Building Owner** who owns a building where a problem exists (in terms of energy consumption), and wants to explore potential retrofitting technologies that may solve the problem, how to finance the project, to identify a Business Opportunity, to place a call for proposals (SMEs offers) and to find SMEs which can help to solve the problem.
- **SME** that is looking for the business opportunities created by the building owners, and create a response to that opportunity (an offer) either individually or creating collaboratively a joint team that will answer all the owner needs.

The following figure shows the NewBEE platform welcome page, the NewBEE entry point, where clearly classifies the potential users into the two groups above mentioned:



*Figure**¡Error! No hay texto con el estilo especificado en el documento.** 2: Two kinds of users for the NewBEE Platform*

Pre-Assessment tool

Owner-user can use the pre-assessment tool to receive a first idea on retrofitting measures and to identify the most appropriate retrofitting technologies based on their requirements. It allows different technical scenarios that might be appropriate to address the building problem at hand. In result different scenarios can be chosen and analysed by costs and earnings by energy savings.

The NewBEE Pre-Assessment Tool provides a web-based user interface to support the following processes on behalf of the owner (additional remark: SMEs can go through the same process in order to understand the owner):

- Insert building data and current energy usage
- Choose from different available measures and create one or more scenarios

- Display, save and print favourite scenarios
- Place project (ask for a call for proposal) in the market place or contact energy consultant or go to financial tool

In the Pre-Assessment the owner-user has to complete three main steps before he can place his project into the marketplace:

- Step 1: Building Data (basic house information)
- Step 2: Action (choose measures)
- Step 3: Results and confirmation (overview, eco meter and payback period)

Financial Calculation tool

The financial calculation tool is a service for users who want to analyse the cash flow generated by a retrofitting project. The main purpose is to improve the owner´s level of awareness in the field of energy-economics.

The module let owners to simulate several ways on how to finance the project and provide schematic annual cash flows comprising expenses and savings generated by the intervention. Users can simulate effects on cash flow of several finance opportunities and different energy cost scenarios.

The graphical user interface (GUI) is designed to be used by a wide variety of people. Users are required to fill three main panels:

- general data information,
- financial opportunities selector, and
- energy saving estimations.

The purpose of the market place is to help SMEs to find Business Opportunities (BO) in refurbishment market and owners to find service providers.

Market Place tool

The market place enables building owners to:

- Register refurbishment projects publishing a call for proposal from scratch or with the help of the Pre-Assessment tool;
- Search for service providers;
- Receive refurbishment offers, i.e. the building owner can see all offers SMEs made according to his/her published business opportunities

The market place supports SME that provide disciplines and services for energy efficiency refurbishment by enabling:

- Registration in the platform
- Business opportunity (refurbishment project) search

- Partner search to create a joint offer with a team
- Send an offer to the building owner by first creating a team on the published retrofitting project

In order to get access to the all the Market place functionalities the user has to be registered and logged in the NewBEE platform as already described in the Login/register menu option. Once registered and logged in to the NewBEE platform, a SME-user as well as an owner-user can gather information about SMEs on the platform, which maintain a public company profile, with additional information like e.g. offered services and disciplines and reference projects. Through this search, SME-users can search for business partners or owner-users can get more details about SMEs which helps the owner-user to foster his decision of selecting SMEs for his/her refurbishment project.

One of the main functionalities for registered SMEs is to find Business Opportunities in the marketplace, i.e. to find refurbishment projects, which have been published by a building owner. SMEs can get detailed information about each business opportunity published. They can respond to such a Business Opportunity by proposing an offer through contacting directly the house owner or creating a team of SMEs to collaborate on a specific refurbishment project as a whole.

Another main functionality for registered private house owners-users is to publish a call for offers – so called business opportunities for refurbishment projects – on the marketplace to which in turn SMEs can apply with an offer. There are two possible ways to publish a Business Opportunity on the marketplace:

- Creation of a new Business Opportunity from scratch and without any Pre-Assessment
- Creation of a new Business Opportunity based on the data from the Pre-Assessment Tool

Energy Performance Assessment Tool

The SMEs and advanced owners can assess the potential energy, cost and carbon footprint savings from different refurbishment actions. The user of the tool can assess the energy performance and the saving potential. The saving potential is assessed in terms of:

- energy consumption (kWh/a)
- cost (e/a)
- GWP (kg CO2e/a).

The tool is available for exploitation by SMEs which do not have much resources of their own to develop and learn energy performance assessment tools but which need energy performance assessment tools in making consultancy, design, product development, marketing, and renovation project management. Typical users can be for example SMEs who offer:

- Consultancy for energy design and life cycle management
- Condition tests, surveys and monitoring
- Inspection
- Energy auditing
- Project planning

- Project management
- Architectural design, HVAC design/engineering
- Product solutions (structural and HVAC) for improved energy performance (exterior walls, roofs, ventilation systems, heating systems, electrical installation, sanitary engineering)

Most of the input data, that the calculation needs, is located in a knowledge database, from where it is collected during the first assessment. These intelligent assumptions and the knowledge database will be customized and fine-tuned for the selected European countries. The user has to know only few parameters of the building in the first phase of assessment; the complex simulation model is made with the help of default values stored in the databases. Tool makes "intelligent" assumptions for the refurbished building. Assumptions are based on the basic data of the building (location, building type etc.). The E-PASS will fetch all necessary details (the U-values, window-types, water consumptions, electricity consumptions, electric appliances etc.) from the database. The building and system details can be specified afterwards as needed.

The easy-to-use-principle is as follows:

- Only few input data needed
- Results are available in few seconds
- When assessing the change because of different refurbishment measures, the basic data can be changed rather easily.

In the starting point the required initial information is as follows:

- Building type
- Weather zone
- Construction year
- Room temperature (Heating set point and Cooling set point)
- Heating type
- Cooling type
- Building volume
- Floor height
- Number of floors
- Dimensions
- Number of occupants
- Number of apartments.

To assess the saving potential data about structures, windows, ventilation, hot water, electricity use, and heating type has to be handled.

WIKI-based Knowledge Repository

The NewBEE wiki gives building owners and SME-user access to information on refurbishment. Content that is provided in the wiki aims to support the main target of the NewBEE project: "strengthen collaboration in the retrofitting value network". The focus in this context is to support three specific situations that typically occur in a construction project or in strategic planning:

A) Support for owners looking for independent information on refurbishment.

B) Use of the wiki during the planning stage of a refurbishment project. Project managers can explain basic aspects of a retrofitting project to their clients by means of the information available in the NewBEE wiki. For instance project managers can use the knowledge repository to explain main retrofitting technologies to their customers.

C) Support for management stuff that strives to improve the business model of their company.

The main parts of information are as follows:

- Building typology
- Available technologies for energy refurbishment
- Financial models and opportunities
- Performance based business models
- Methods and standards for energy and cost saving calculation
- Potential savings

Business Model Assessment Tool

This tool is aimed to provide a short assessment to CEOs and management stuff of small companies that are interested to review their business model. The business model gives a first orientation concerning optimization potentials to them. Opposed to other tools such as pre-assessment tool or energy assessment tool, the business model assessment exclusively addresses the needs of small business and not the needs of building owners except the needs of large building owners acting as facility managers.

Concerning the overall methodology and objective of NewBEE to bridge the gap between small business and private house owners the business model assessment helps SMEs to prepare for the future. Due to the better integration between customer and the value chain (market place), transparency concerning technical retrofitting measures (e-pass tool) and initial guidance for the customer (pre-assessment) there is a need that future business models of SMEs in the retrofitting sector should be more tailored and more flexible.

The business model assessment supports this process of change. The business model assessment should be used before the other offerings for business model improvement on the NewBEE platform are used. It is recommended that after the review of the current business model in a second step the business model handbook in the wiki is used to improve the business and success stories as well as business model descriptions are used to get suggestions for a possible new orientation.

The tool is a guided questionnaire that gives users the opportunity to do a qualitative rating of their company performance concerning different aspects of their business model. Answers are multiple

choice – i.e. the users will tick the box with the answer that reflects the actual performance of his company concerning each aspect that is scrutinized in the questionnaire. Questions are aligned to the Osterwalder Business model framework. Therefore it is ensured that all building blocks of a business model are considered in the NewBEE assessment. The assessment covers the business model performance in general but also aspects that are related to the market (such as acquisition skills or competitive strategy), to the internal organisation (e.g. project management capabilities, resource availability) or networking aspect (such as relationships in the supply chain or network competency in general). The number of questions the user is asked are around 20.

DEMONSTRATORS

During the project four demonstrators have been developed to validate and demonstrate the energy saving measures and energy generation within buildings aiming to incentivize and accelerate the adoption of energy efficient solutions".

Spanish Business Case

In order to validate and demonstrate the energy saving measures, it has been planned four different scenarios for the Spanish business case; in each one of them it is presented the utilization of different NewBEE's tools in different situations. The comparison of the current retrofitting approach with NewBEE approach and evaluation of outcomes for the stakeholders involved in the value chain is presented in the different scenarios:

- S1: A community of neighbours who requests a service retrofitting. The demonstrator simulates the global retrofitting of the facades of an apartment building.

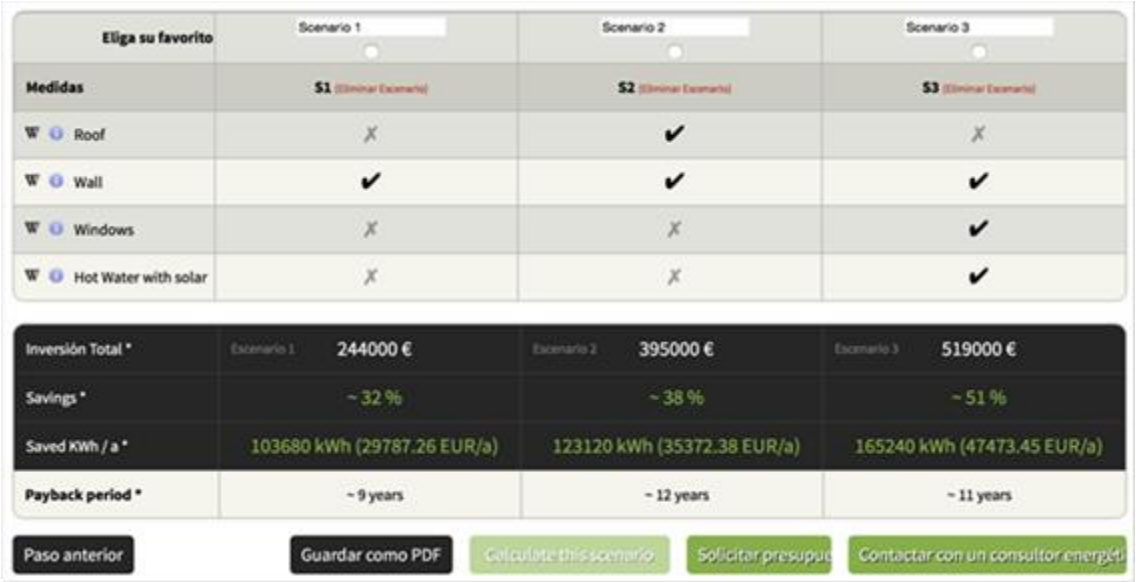
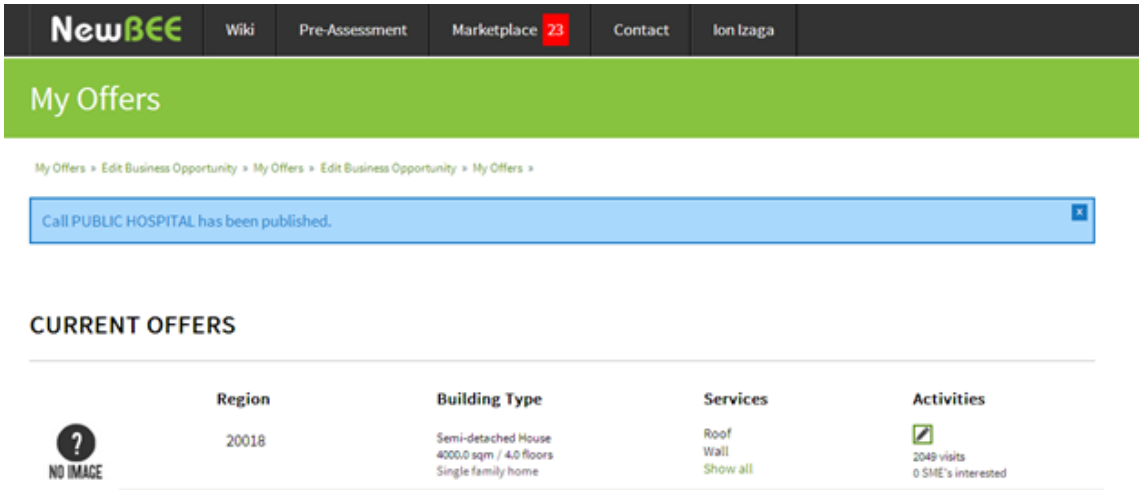


Figure 3: Spanish S1 Results

- S2: A tender of a big retrofitting work to show that a set of SMEs can tackle it. The demonstrator simulates how different SMEs can use the NewBEE tool to present a joint offer to tackle the subject of the tender.



PUBLIC HOSPITAL

La tabla muestra los flujos de efectivo esperados por el proyecto durante su vida útil. El gráfico representa gráficamente la salida/entrada anual y los ahorros acumulados generados por el proyecto.

Volver al inicio

Inversión	92000 €	**Tipo Finanzas**	Own capital
% Interés	5 %	**TIR**	41.1 %
VAN	489909 €	**Tiempo de retorno de la inversión**	2.43039 years

Años	Los gastos anuales	Ahorro anual	VAN Salida	VAN Entrada
0.	-92000 €	0 €	-92000 €	0 €
1.	0 €	41074 €	0 €	39118.1 €
2.	0 €	41074 €	0 €	37255.33 €
3.	0 €	41074 €	0 €	35481.27 €
4.	0 €	41074 €	0 €	33791.68 €
		Muestra más datos		
Suma	**-92000 €**	**1151720 €**	**-92000 €**	**595849.66 €**

Figure 4: Spanish S2 Results

- S3: A real work of retrofitting from which we can obtain both physical and economic data and compare them with NewBEE system. The demonstrator simulates how a retrofitting intervention can be done from the different user´s perspective:

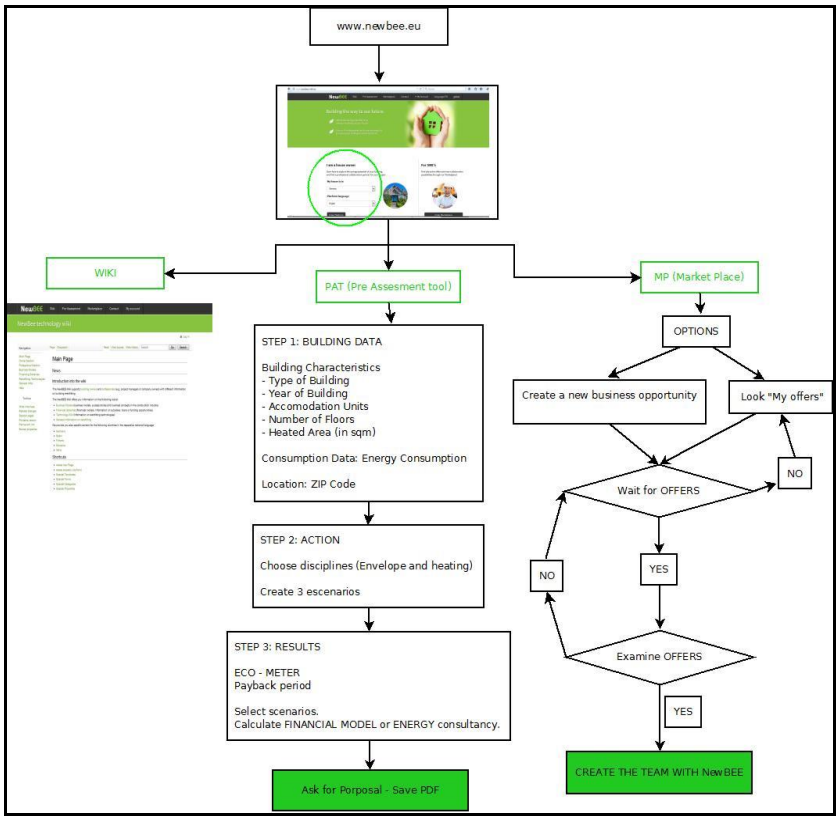


Figure 5: Spanish S3 Owner workflow

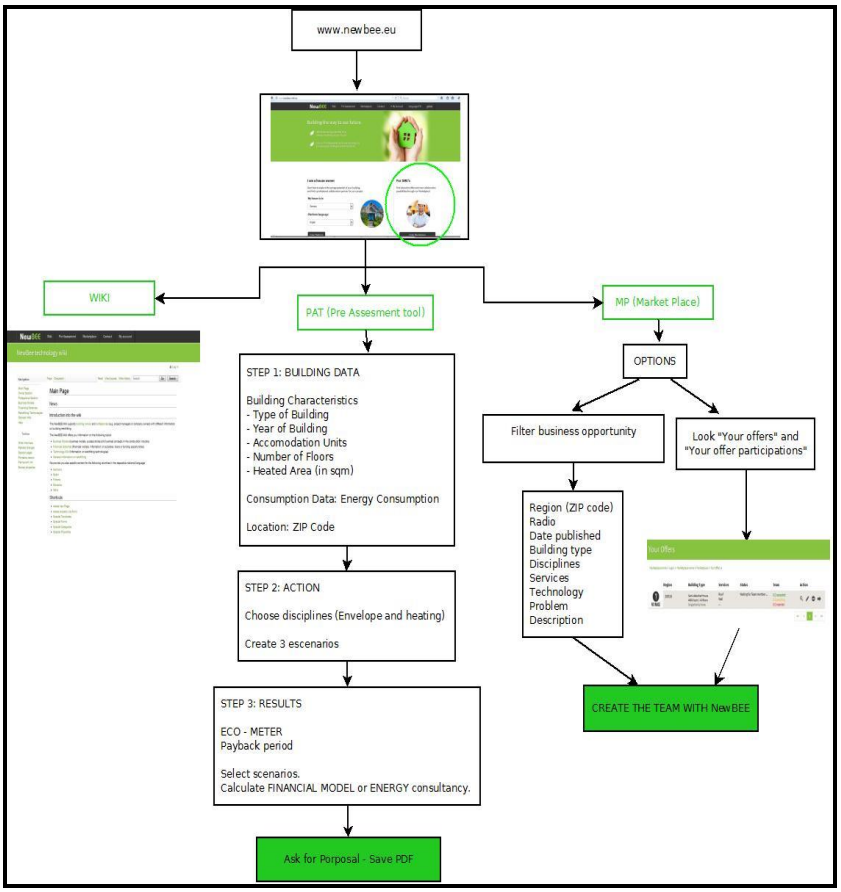


Figure 6: Spanish S3 SME workflow

- S4: The MEEFS project to test accurately the E-PASS tool. The demonstrator simulates the MEEFS technology in an apartment building located in Merida.

Figure 7: Spanish S4 Results

German Business Case

Three German business cases of the NewBEE project have been defined to validate and demonstrate the energy saving measures. It provides insight into future collaboration mechanism of stakeholders

in the retrofitting process. Business case G1 and G3 describe the application of the NewBEE knowledge repository (wiki) and the NewBEE business model assessment by professionals/SMEs in the construction sector. G2 focus on the improved integration of building owners in the planning of a specific retrofitting measure. It is exemplarily shown for one specific retrofitting project how the new process is designed and at which stages of the project the NewBEE platform will bring benefit.

- Business case G1: Support of a working group on energy-efficient construction and refurbishment

  This business case describes the application of the wiki within a working group for the construction industry. The main idea is to use the wiki as a collaboration and knowledge platform within a working group and give registered users access to information and knowledge provided by working group members or knowledge that was developed in common sessions in the working group itself. The wiki will improve the collaboration and is a new element for knowledge sharing that increases the overall value of a working group for participating members. Compared to former (traditional) ways of providing the gained knowledge, like distribution of information by mail or providing a paper-based summary of working group meetings, the wiki is more attractive for members. Its advantages are the better structuring, the flexibility concerning continuous adaptions of the content and the semantic features (like semantic search).

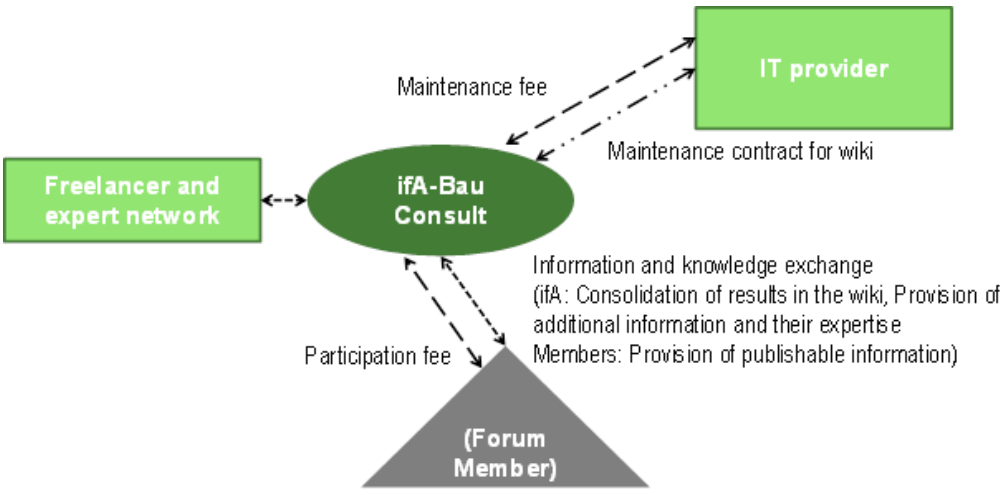


Figure 8: German Demonstrator Building of Scenario G1 description

- Business case G2: Application of NewBEE platform to support the retrofitting of a German single-family building

  This scenario shows the future collaboration of building owner and Rahm due to the advances provided by NewBEE. The application of the tool is mainly at early stages of a retrofitting project and, in the future (in an extended version of the wiki), also at a building's operation stage. The NewBEE platform provides value-added from the first information research of an owner seeking to refurbish his building. The business case description shows how the user is supported by identifying a construction company with a good reputation by means of the NewBEE marketplace, how the user can benefit from the pre-assessment tool, the financial calculator and the wiki. These tools can be used in general to support the initial research activities of a building owner, the meeting with the construction companies and their

preparation activities but also the early planning activities in the construction process. The building that has been chosen for the demonstration is a typical detached house in the area of Stuttgart, Baden-Wuerttemberg (Southern Germany). It was originally a two-flat building that has been turned into a one-family building by connecting both floors and adapting the building according to the needs of a young family with two children. Due to the age of the building (it was constructed in 1935), a holistic energy-efficiency concept was developed and realised for the building. The specific needs of the region and the new owners were considered.

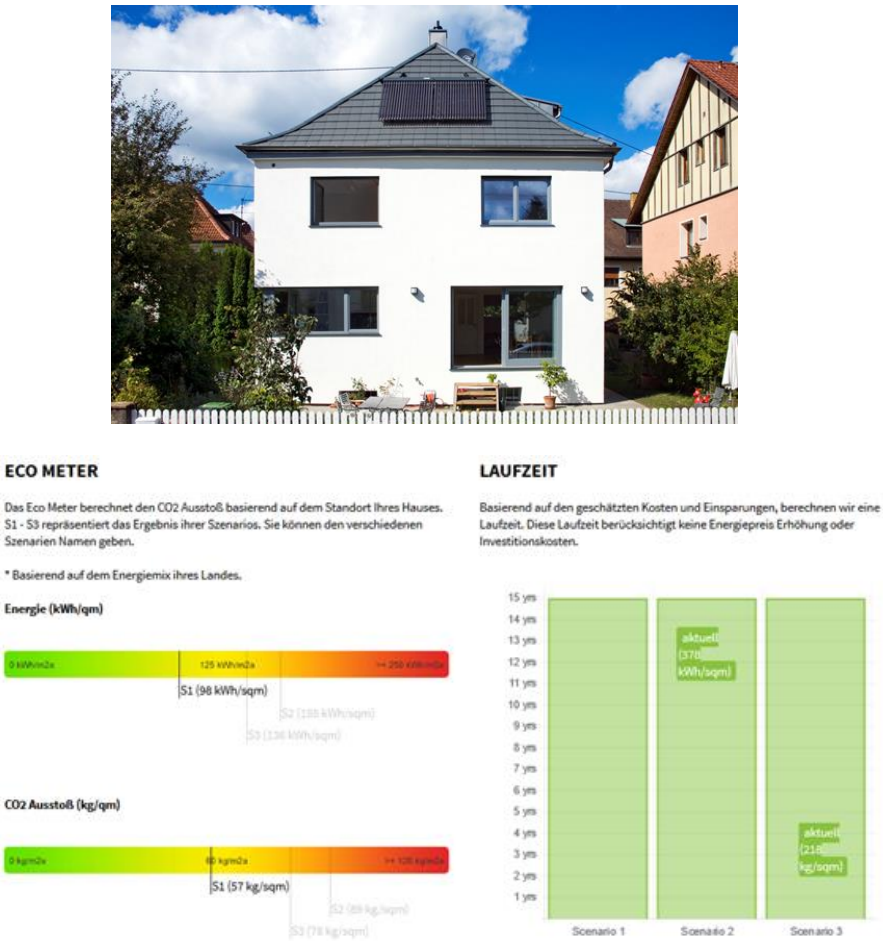


Figure 9: Demonstrator Building of Scenario G2

- Business case G3: Application of the Business Model Assessment to support the business development of a SME in the construction industry.

  The Business Model Assessment is a tool that supports the review of a business model. The structure is presented in the picture below. The guided assessment for CEOs or managers helps them to identify the strengths and weaknesses of their business model. The NewBEE wiki gives additional advice concerning the improvement of a business model and next steps after the assessment. This business case shows exemplarily for the company Rahm how they conducted the assessment, which results they achieved and, based on the report, which recommendations where given in a first step. The tool can be accessed via: (http://plm.iao.fraunhofer.de/newbee/homePage1.aspx).

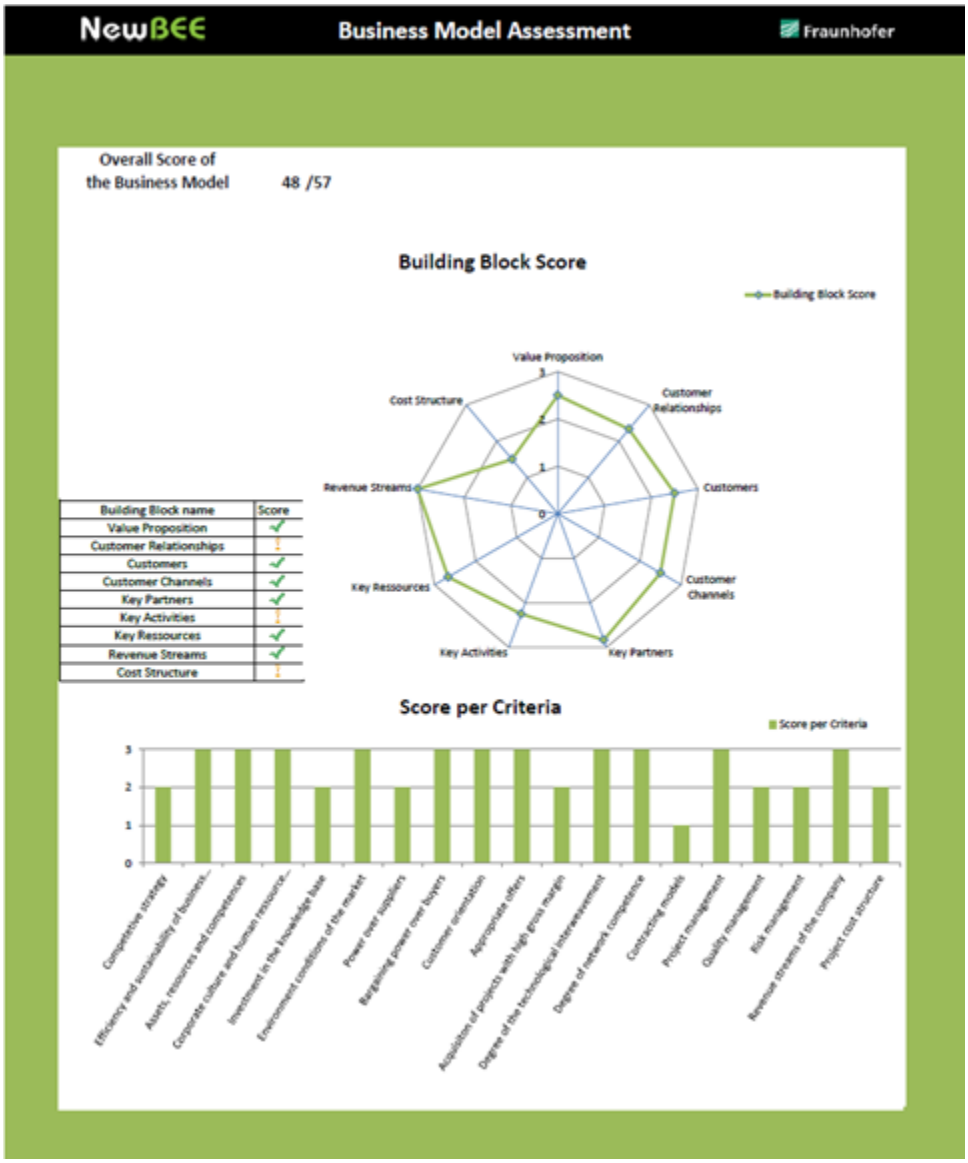


Figure 10: NewBEE Business Model Assessment - Rahm report

Finnish Business Case

The Finnish Business Case focuses on the development of energy-efficient and sustainable retrofitting processes with the help of three different case studies based on different building types (detached houses, block houses and office buildings). The SMEs involved in this Business Case put in practice the project concepts and tools and involved a refurbishment client in the application of the NewBEE platform and Methodology. The measures and solutions are based on the project scope: the location, use, type, age, structures of the building as well as the client's budget. A close collaboration with research partners and SMEs is in the centre of this business case. The role of the cases studies provide concrete scenarios where the sustainable retrofitting processes are developed and tested. The Finnish SMEs (FE, KVA and T-E (former ERI)), with the support of VTT, described the Business Cases and extracted functional requirements, based on previous retrofitting projects experiences, for the specification and development of NewBEE system. The SMEs demonstrated the new retrofitting processes in three case studies within this Business Case.

The NewBEE Market Place tool was demonstrated in organized sessions where the Finnish SMEs used the tool following the corresponding steps of realistic cases. Here two different scenarios were taken into account:

- S1: House manager of housing association created a Business Opportunity (consultant);

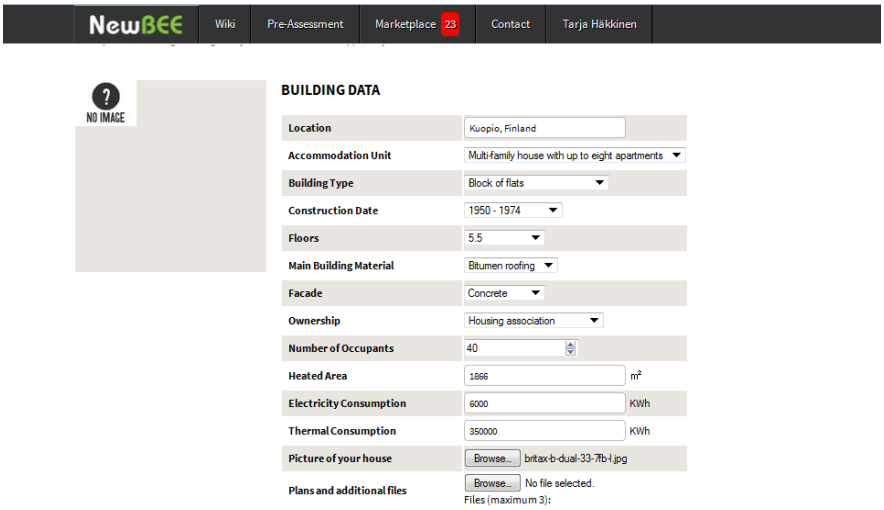


Figure 11: Finnish S1 Results

- S2: Energy consultant or architect searched for Business Opportunities.

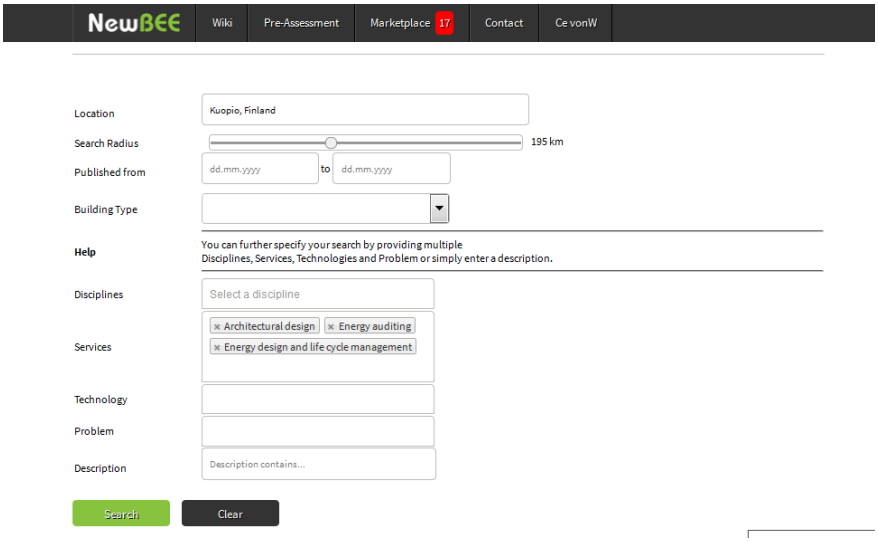


Figure 12: Finnish S2 Results

E-PASS tool was demonstrated in two different scenarios:

- S3: In this case study the Finnish SMEs used the tool to follow the steps of a real situation (Energy consultant or architect uses E-PASS to support a house manager to find rational opportunities for energy refurbishment).

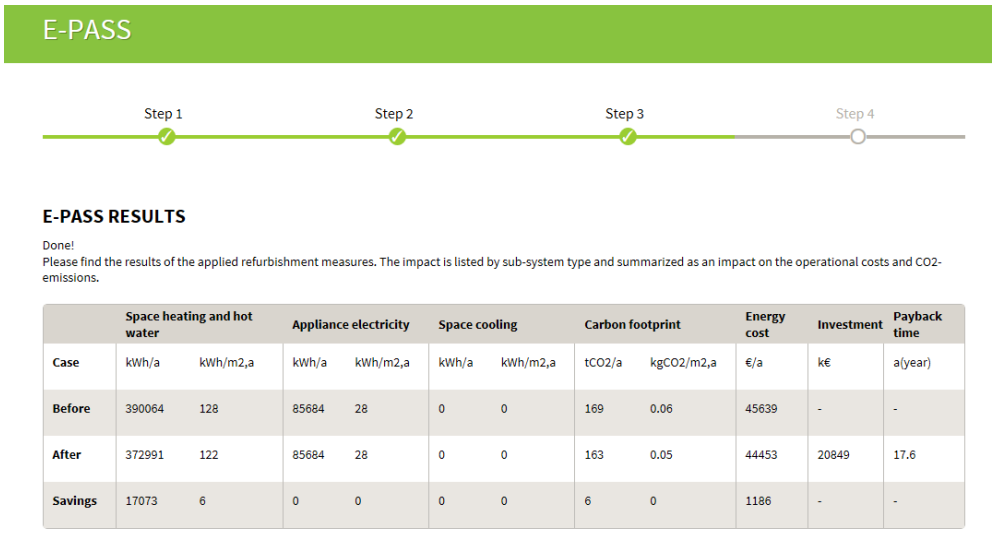
E-PASS RESULTS

Done!
Please find the results of the applied refurbishment measures. The impact is listed by sub-system type and summarized as an impact on the operational costs and CO2-emissions.

	Space heating and hot water		Appliance electricity		Space cooling		Carbon footprint		Energy cost	Investment	Payback time
Case	kWh/a	kWh/m2,a	kWh/a	kWh/m2,a	kWh/a	kWh/m2,a	tCO2/a	kgCO2/m2,a	€/a	k€	a(year)
Before	281560	141	56058	28	0	0	120	0.06	31689	-	-
After	270163	135	56058	28	0	0	116	0.06	30898	18005	22.8
Savings	11397	6	0	0	0	0	4	0	791	-	-

Figure 13: Finnish S3 Results

- S4: In this case study the E-PASS was demonstrated by arranging a session together with a (real) house manager. Finnergia used the tool together with the client to show how it would work in a real situation where the best options for energy refurbishment are searched for with the help of the E-PASS tool.



E-PASS RESULTS

Done!
Please find the results of the applied refurbishment measures. The impact is listed by sub-system type and summarized as an impact on the operational costs and CO2-emissions.

	Space heating and hot water		Appliance electricity		Space cooling		Carbon footprint		Energy cost	Investment	Payback time
Case	kWh/a	kWh/m2,a	kWh/a	kWh/m2,a	kWh/a	kWh/m2,a	tCO2/a	kgCO2/m2,a	€/a	k€	a(year)
Before	390064	128	85684	28	0	0	169	0.06	45639	-	-
After	372991	122	85684	28	0	0	163	0.05	44453	20849	17.6
Savings	17073	6	0	0	0	0	6	0	1186	-	-

Figure 14: Finnish S4 Results

Pre-assessment tool was demonstrated in one scenario:

- S5: Refurbishment in “HakaPaavo”.

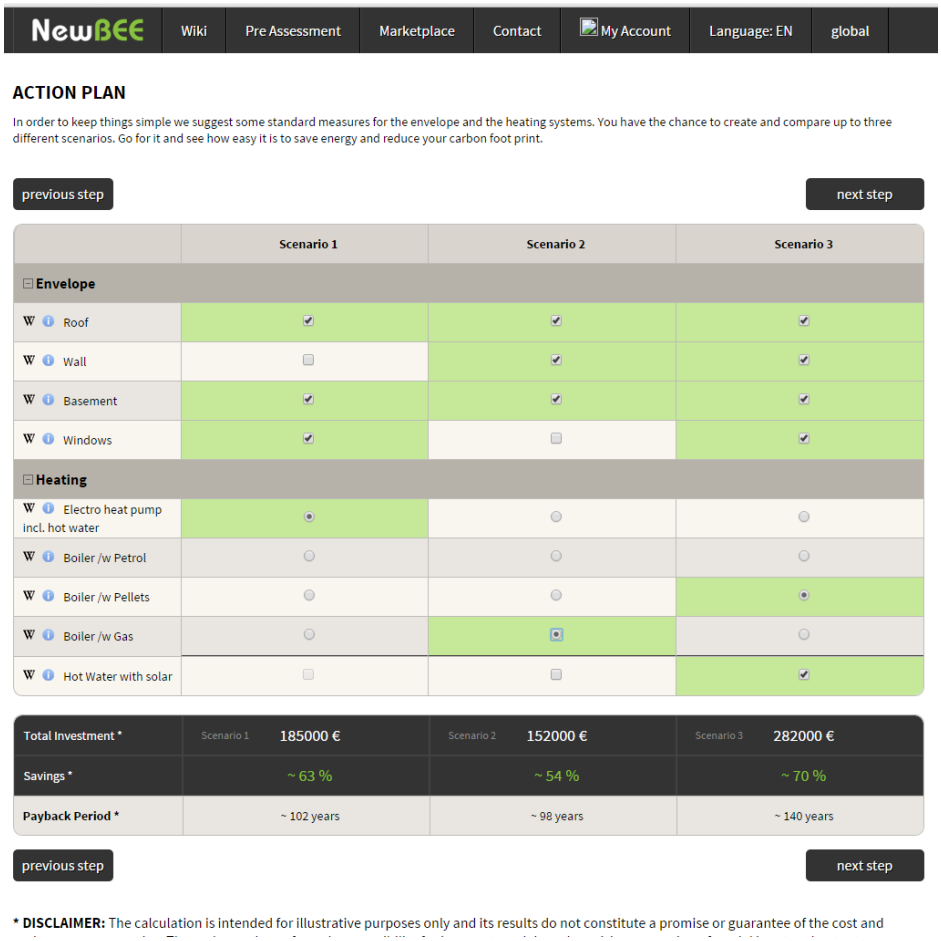


Figure 15: Finnish S5 Results

Slovenian Business Case

The proposed case derives from experiences gained during renewal of Posočje region after the earthquakes in 1998 and 2004. As more than 3.000 buildings were damaged in the 1998 earthquake the state organized help to reconstruct the area. The government secured funds for subsidies to residents in order to reconstruct their damaged homes. The government established the State Technical Office (STO) to be an administrator of governmental help. The office helped owners in the process of reconstruction and to obtain financial governmental aid. The STO also took care of revision (check of design) and supervision work. For design and construction works supported by government the companies have to attend short training (prepared by STO) on specifics of earthquake reconstruction to achieve a unified level of quality. After that, owners were free to choose one from the list of their choice.

The rationale of why to organize a STO was to handle a high spike of demand on reconstruction in the area. On the free market that would greatly increase the works prices. The second objective was to guarantee a high quality of the performed reconstructions.

This experience should be transferred into a new scheme for large scale retrofit of energy efficiency of buildings. One reason is because construction sector in Slovenia is in deep crisis and there were suggestions to help sector with government support to EE renovation with two main objectives:

- To lower Slovenian footprint on environment (energy consumption, CO2 emission, etc).

- To help to survive Slovenian SMEs in construction sector by providing more reconstruction works.

The envisioned large scope reconstruction for achieving better energy efficiency of the building stock should be holistic, taking into account that Slovenia is an endangered by natural threats country. It needs mitigation measures for earthquakes, landslides, floods, even strong winds or high snow. All this should be (and is) considered during the design phase. More problematic is to ensuring proper financial resources and governmental support to meet those goals.

With Slovenian Business Case "large scope retrofit of apartment buildings in Slovenia" we tried to demonstrate the working method of the NewBEE platform and its parts:

- ❑ Using the NewBEE calculation tools – comparison with current existing methodology:
  - ❑ Pre-assessment
  - ❑ Financial calculator
- ❑ Simulating the use of:
  - ❑ Marketplace
  - ❑ Wiki

The demonstration is based on data of real buildings (type, dimensions, characteristics, energy consumption) in normal practice for handling retrofitting works by the partner staff and other partner companies. Results of NewBEE tools are compared to results of other (more time consuming) methods.

In the case of Slovenian Business Case there were three scenarios to demonstrate the NewBEE system in real environment:

1. **Motivate for retrofit**; use of NewBEE platform/tools (quick tool) to show owners of residential multi-apartment old building the potential of energy efficiency retrofitting;

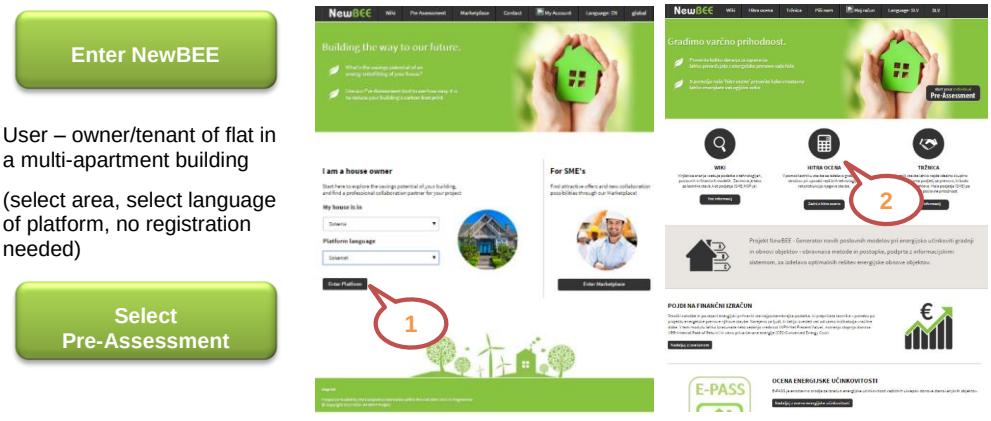


Figure 16: Slovenian S1 Results

2. **Finance for retrofit**; use of NewBEE financial tool for owners to play with different scenarios for financing the retrofitting of their building;

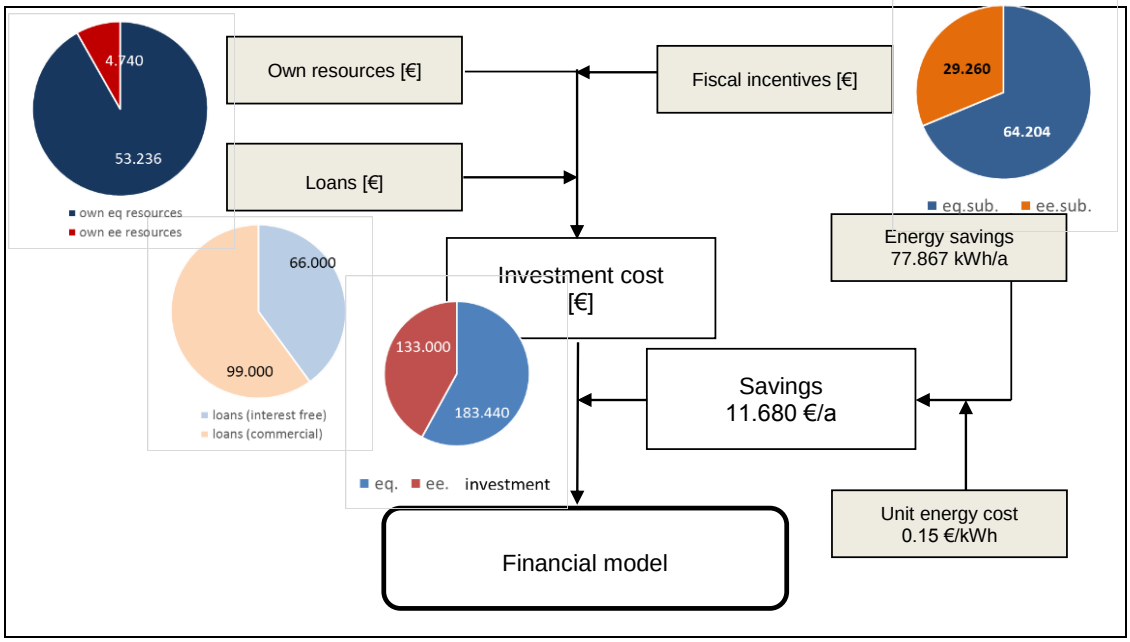


Figure 17: Slovenian S2 Results

3. **Connect for retrofit**; test the response of SME on published inquiry for retrofitting works on a NewBEE marketplace.

SME is checking published inquiries

SME enter NewBEE

(SME has been previously already registered)

filter opportunities (1)

Requests for offers can be filtered by location, dates, services requested…

compose a team (2)

After checking own company capabilities and resources a user can decide to invite partners to form a team.

The platform provides a list of required services (works) and for each a sub list of possible partners together with their rating.

select an appropriate partner for a part (3)

invite partners (4)

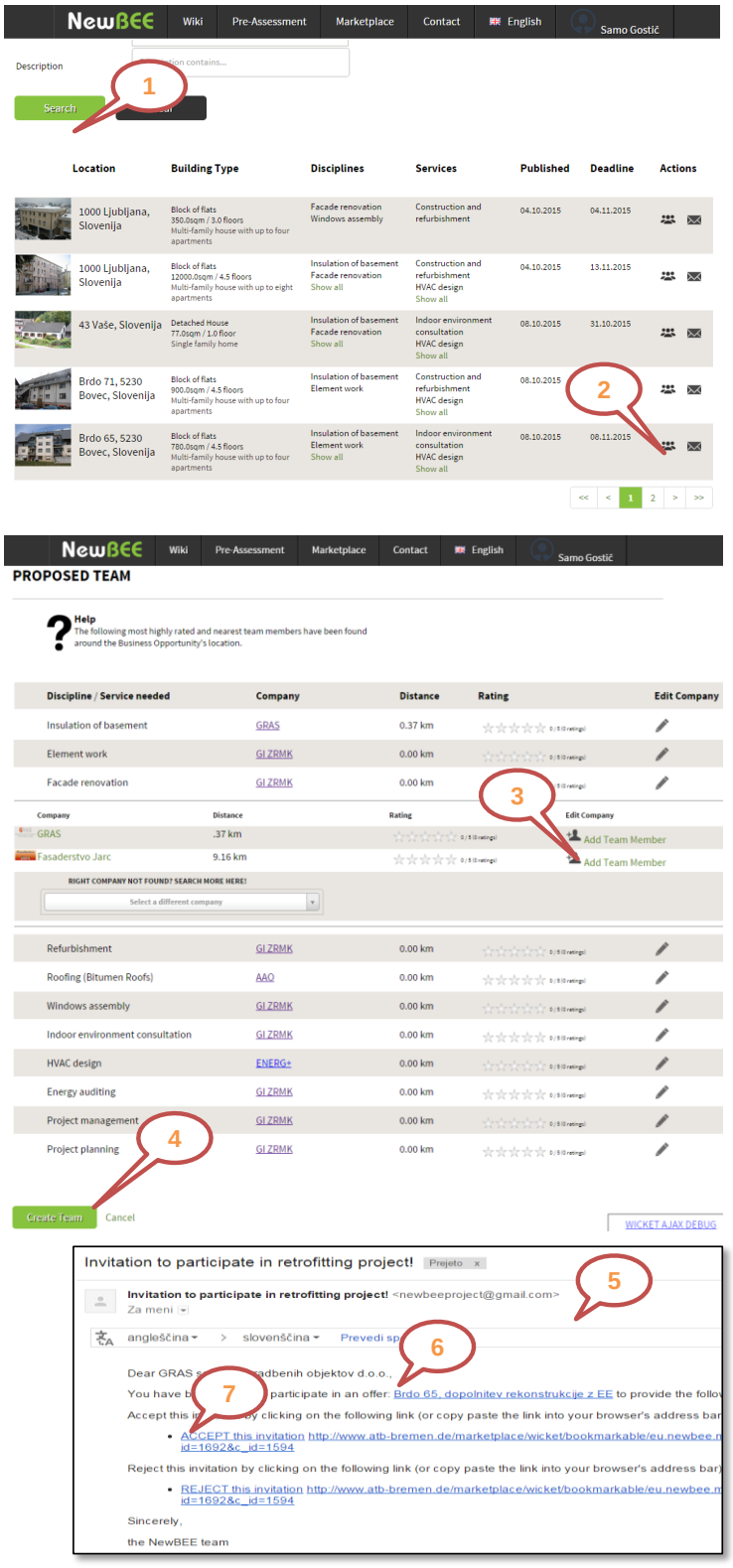


Figure 18 – Slovenian S3 Results

4.1.4 Potential Impact

The following table presents an overview of the main scenarios and benefits achieved by the four ***NewBEE Demonstrators***.

Table 2: Main scenarios and benefits of the four demonstrators

Partners	Scenarios	Benefits
ACC/TEU/ ESL /TEC	• S1: A community of neighbours request a service retrofitting • S2: A tender of a great work to show that a set of SMEs can tackle it • S3: A real work of retrofitting from which we can obtain both physical and economic data and compare them with NewBEE system. • S4: The MEEFS project to test accurately the E-PASS tool.	• The project allows an SME to work in new collaborative way getting involved in projects born in the market-place. • The project allows training internally our own technical staff, having also new tools to advice the market. • Also the NewBEE Platform is an opportunity to advice the Retrofitting market (Having a Local Parameterization) that permits a SME a different approach to a potential customer, having a new Commercial tool. • The possibility of finding partners easily helps to focus only in the main company core business and thus to improve its skills in the specific fields needed.
RAHM/IFA /FHG	• S1: Support of a working group on energy-efficient construction and refurbishment • S2: Application of NewBEE platform to support the retrofitting of a German single-family building • S3: Application of the Business Model Assessment to support the business development of a SME in the construction industry.	• The Assessment is easy to handle for managers of small companies • Gives a first indication concerning optimization potential • Based on the results of the assessment experts can be consulted • Is not tied to another (charged) service but freeware • Combined with the other information available in the wiki there are several tools (examples, best-practices, Handbook on Business Model Design) that support the evolution of a company
FINN/ ERIK/KVA /VTT	• S1: House manager of housing association creates a business opportunity (consultant); • S2: Energy consultant or architect searches for business opportunities. • S3: Energy consultant or architect uses E-PASS to support a house manager to find rational opportunities for energy refurbishment. • S4: E-PASS demonstration by arranging a session together with a (real) house manager. • S5: Refurbishment in "HakaPaavo".	• It was regarded as a good feature that the input fields are filled with default data once the construction year is selected, and the user just needs to check, if they are correct. Especially for the heating and cooling options the tool seems to give correct options right away. • The demonstration participants concluded that the tool could be very useful for the planner or consultant for first estimations of the renovation options.
ZRMK/ SGG/ ATB/ UNIPD	• S1: Motivate for retrofit; use of NewBEE platform/tools (quick tool) to show owners of residential multi-apartment old building the potential of energy efficiency retrofitting;	• Quick estimates for costs and benefits of building retrofit for energy efficiency (visual enhanced – better communication with investors) • Info pages – compendium on technology, finance and business models also good practice cases, references, info on SMEs

	• S2: Finance for retrofit; use of NewBEE financial tool for owners to play with different scenarios for financing the retrofitting of their building; • S3: Connect for retrofit; test the response of SME on published inquiry for retrofitting works on a NewBEE marketplace.	• Fast forward from initial estimates to getting an offer • A new channel generating more demand on their services • A new connection place (between SMEs) to act as a cluster and provide and manage integral, comprehensive approach to rehabilitation projects, integrated design, comprehensive solution at reasonable overall cost • A cluster organization enable specialization and optimal use of resources

The demonstrators, conceptualized and prepared by the NewBEE consortium as technological showcases, provided not only an optimal way to communicate the project results to a wider audience, but also a framework from which to evolve NewBEE prototype into a successful commercial product. Based on the technical and business metrics assessment provided by the industrial partners who participated in the creation of the demonstrators, it can be established that the features of the system realized in the integrated prototype have, by far, exceeded end-users' needs and expectations.

The impact associated to the results will affect to several actors and communities. Next sections explain which impacts result after full implementation of the project:

Impact on economic, organisational and social innovation: The transformation towards low carbon cities is supported by the NewBEE project through enabling SME driven retrofitting projects for building types that incorporate the highest potential for optimising cost, quality and energy efficiency throughout their lifecycle. The creation of a framework that (1st) motivates the building owner to start a project, (2nd) identify the most appropriate technological retrofitting solutions based on their lifecycle performance, (3rd) appropriate business models and necessary stakeholders within the value chain are proposed through the business model generator and (4th) the creation and collaboration of SME-networks is supported through appropriate project management and data interaction tools.

Impact on incentivise uptake of these energy-efficient solutions by increasing profitability and reducing risk. Financial and organisational aspects within the business model are able to link risk and profitability to performances throughout the building lifecycle. Through the integration of lifecycle performance already in early planning phases of retrofitting projects by developing an easy-to-use "simulation" platform that incorporates performance indicators on newest technological solutions, retrofitting projects are evaluated not only by their direct cost, but by their potential by means of energy reduction, increase in comfort and overall building valuation. The application of performance related financial and organisational models enables the incentivisation of stakeholders and thereby is a major driver for carrying out retrofitting projects.

4.2 Use and dissemination of foreground

The dissemination activities have been taking place from the very beginning of the project and have been intensified during its final part; the Demonstrators are used and will be further used as proofs of concept. "The results and experiences of development projects are meaningful only, if they are introduced into use and lead to functional changes. Dissemination is generally seen as a measure, through which the results are brought into the awareness of certain groups."[3]

It is helpful to think about dissemination in three different ways:

[3] Suurla, Rita; Markkula, Markku. Effective Dissemination, A guide on the Dissemination of the Results of International Educational projects, Finish leonardo Centre, Helsinki, 1999

- Dissemination for Awareness,
- Dissemination for Understanding,
- Dissemination for Action.

Dissemination for Awareness

At the beginning of the project this way of dissemination was important for all target groups, which had to be informed of NewBEE project at least. For creating an awareness of the project and project's work is helpful "word of mouth" type dissemination which helps to build an identity and profile within the interested community. Usual methods for this way of dissemination were e-mailing, face to face meetings, NewBEE website, project partners websites and newsletters, NewBEE promotional leaflet, mass media communication and similar. Basis for dissemination for awareness was good knowledge and understanding of key messages of NewBEE project. This type of dissemination actually never stops, because there is no possibility to reach all stakeholders at the same time.

Dissemination for Understanding

Some target groups can directly benefit from what NewBEE project has to offer. It is important, therefore, that these groups/audiences have a deeper understanding of the project's work. This have been done via publications (scientific literature and dedicated journals and reviews in the field of energy efficient retrofitting, architecture and construction trends, engineering and processes, etc.), via conferences, workshops, symposia, conferences, exhibition fairs, via clustering activities with other European related projects and related associations. Basis for dissemination for understanding was a good knowledge of impacts and key results of the project.

Dissemination for Action

« Action » refers to a change of practice resulting from the adoption of products, materials or approaches offered by the project. These groups/audiences will be those people that are in position to « influence » and « bring about change » within their organisations. These are the groups/audiences that will need to be re-equipped with the right skills, knowledge and understanding of your work in order to achieve real change[4].

Elements of the dissemination plan.

Dissemination plan was developed in accordance with the SAVE Dissemination Guide: "How to ensure impact at a wider scale", developed for the SAVE II Programme, the predecessor of Intelligent Energy – Europe, and available at:

http://ec.europa.eu/energy/intelligent/files/implementation/doc/save_dissemination_guide_en.pdf

Table 3 Elements of the dissemination plan

STEP 1: What should we disseminate? **Result:** A list of the main outcomes of the project.

[4] Harmsworth, Sally, Turpin, Sarah. Creating an Effective Dissemination Strategy. TQEF National Coordination team, July 2000

STEP 2: Who should be informed / involved? **Result 1:** A list of group of actors that should be approached by the project or partnership categorised fewer than three headings (user, decision maker, and supporter). **Result 2:** A list with links, indicated between the project and groups of actors.
STEP 3: How to disseminate (inform / involve)? **Result:** A list of means or media that are being used to contact potential users, decision makers and supporters.
STEP 4: When to disseminate? **Result:** A calendar for the activities selected in STEP 3.
STEP 5: Implementing and updating the strategy of dissemination.

STEP 2: Who should be informed / involved? A list of the identified stakeholders.

Main stakeholders, identified at the beginning of the project are presented in Table 4.

Novel and innovative approaches, business models, collaboration tools, revenues models, innovation and new technologies uptake are really difficult to implement in traditional and rigid sector as construction. This is especially important consideration when we speak about SMEs, their collaboration and collaboration with other, bigger business actors in construction process. The impact of the project to retrofitting SMEs in the construction sector and other related stakeholders can be increased if they actively participate (in workshops, interviews) or are intensively informed about the project aims, results and exploitation possibilities.

We believe, that the message of the project can be more influential when the first successful stories will be finished and experiences, gained from them are able to present to the target audience. This is the task and opportunity for all NewBEE partners, interested in exploitation of project results.

During the project period we worked hard on preparation of project results. Therefore, dissemination was more oriented to increase of awareness and understanding of the project and to spread the main message of the project. We also contacted the stakeholders and asked them for feedback.

The project was officially completed. The real work on the exploitation of the results is actually just beginning. This is an opportunity for us, project partners, and to all who will recognize the value of our work. In order to be successful in this, we need to seek external partners and to create a support network. We believe that at European level this could be a network of partners within Renovate Europe campaign. The first contacts are underway. As mentioned before, the visibility of the platform NewBEE will increase when they become available the first practical results of application and feedback from (we assume) satisfied users. Our interest is to work on dissemination in the post project period.

Table 4: list of the identified stakeholders

Category	Potential stakeholders
EU	EU Commission, directorates: • create EU and national policies and measures for improvement of sustainability, including energy efficiency of the building
AUTH	Local authorities & national/regional public bodies, urban space planning authorities: • key players as policy makers (EE and RES incentives), favourable legislative framework creation, spatial planning, public procurements, owners and promoters of their own buildings. The municipalities associations and networks

	will be considered as promoters of new business practices on broader (district, municipality) levels.
INVEST	Investors (in real estate projects, also representatives of investors in public buildings), financial institutions, estate agents, insurers, agencies managing subsidies: • key actors providing business objectives (for example total costs of ownership), building performance requirements, requirements for the project management and supervision.
ARCH	Architects and designers, consulting and contracting engineering companies: • plan and design the retrofitting works on particular building or district level.
CONSUL	ESCOs, Energy Management Agencies, energy consultants, electric /heat /gas utilities: • provide different services for the design and execution of the retrofitting works on particular building or district level.
SMES	Retrofitting SMEs (contractors in general, installers): • should be aware of the business models and related business opportunities.
PROVIDER	SMEs and other developers and providers of retrofitting technologies and systems (specialized in particular retrofitting technology, manufacturers, including products, materials, installations, HVAC systems, ICT tools): • have important impact to the retrofitting processes and business models development.
ASSOC	EU organizations, association and networks (ECTP, E2B…), business and professional associations: • define and stimulate new business practices, establishing rules for professional conduct.
B-MNG	Building managers, operators, buildings owners and occupants when they operate and use the building: • develop requirements and plans to sustain the performance of the building related to usability, maintainability, cost of operation, etc.
TENANT	End users, tenants: • formulate requirements in regard the in-door environment, functional and operational requirements for building and provide feedback on retrofitting measures implemented.
R&D	Researchers and academics: • develop and transfer new knowledge, new technologies and services and can supervise the first market implementations.
FINANCE	Financial institutions, funds, etc.

As is presented above, many types of stakeholders were identified, so the question was "How to attract them?" What to tell them to raise awareness of the project. Due to variety of the stakeholders different key messages about the project have been prepared for all of them:

- Key message to EU commission and related directorates
    - *Directorate-General for Enterprise and Industry*
    - *The Directorate-General for Climate Action*
- Key message to policy makers and public authorities
- Key message to investors and building owners
    - *Investors*
    - *Building owners*

    - *Professional building owners*
- Key message to architects
- Key message to consultants
    - *ESCOs*
    - *Energy Designers*
    - *Engineers active in the energy efficient retrofitting*
- Key message to SMEs
    - *Construction companies*
- Key message to investors
- Key message to providers
    - *Manufacturers of EE technologies*
- Key message to associations
    - *Professional associations/networks active in the energy efficient retrofitting*
- Key message to building and facility managers
    - *Facility managers*
    - *Key message to tenants and users*
- Key message to research and development organizations
    - *Related EU project leaders*
    - *Research universities*
- Key message to financial institutions

Table 5 Key messages for Stakeholders

stakeholders	Message
European Commission	NewBEE platform will help building stakeholders to generate new Energy-performance Business Models based on the identification of Business Opportunities (retrofitting projects). Building owners will identify retrofitting business opportunities with the NewBEE platform whereas SMEs will identify potential projects and create temporary project – specific networks to complement each other expertise.
Directorate-General for Enterprise and Industry	NewBEE platform will help building stakeholders to generate new Performance-based Business Models for Energy-efficient retrofitting projects
The Directorate-General for Climate Action	NewBEE platform will help building stakeholders to generate new Performance-based Business Models for Energy-efficient retrofitting projects, to improve the energy performance of the buildings and reach the 20-20-20 targets.
Policy makers, public authorities	Using NewBEE platform: • You will have access to the European Directives on CO2 emission reduction in public buildings • You will find support for development of legislation to incentivize the use of energy efficient retrofitting technologies which help to curb energy consumption • It will facilitate to establishing tender evaluation criteria • You will be able to analyse retrofitting tenders based on their energy efficiency • You will improve the initial ROI assessments of retrofitting intervention scenarios.
Investors	The pre-assessment tool will allow you to assess the possible

	technical and financial options to minimize the pay-back period and maximize return on investment.
Building owners	NewBEE - For a better living environment: Explore technical solutions and financing options for your building to maximize energy efficiency and return on investment. NewBEE will offer you a platform for identifying and contacting companies in your area that are specialized in energy efficient retrofitting The pre-assessment tool will allow you to assess the possible technical and financial options to minimize the pay-back period and maximize return on investment.
Professional building owners	New BEE will offer you a perfect environment for meeting the best solution providers for your building energy retrofitting projects. The pre-assessment tool will offer you to identify solutions with a minimum pay-back period.
Architects	Pre-assessment tool and technology database is used to guide the customer and support the client decision making in the pre-qualification stage. Both can be used to show quick references or success stories to the client. I.e. showing the benefit to the client. In NewBEE platform, energy efficiency retrofitting requirements and impacts will be shown in a easy to understand format, with real examples.
ESCO[5]s	With the help of NewBEE platform you will have possibility to find new business opportunities.
Energy Designers	The NewBEE platform will offer access to actual and planned retrofitting projects, as well as fast and easy comparisons of energy efficient retrofitting technologies. With the help of NewBEE platform you will have possibility to find new business opportunities.
Engineers active in the energy efficient retrofitting	The NewBEE platform will offer access to actual and planned retrofitting projects, as well as fast and easy comparisons of energy efficient retrofitting technologies. With the help of NewBEE platform you will have possibility to find new business opportunities.
Construction companies	With the NewBEE, your company will have the best consultancy tool on efficient retrofitting, being informed about the last technologies, a »live« marketing channel and a platform on which you can set up temporary project – specific networks to collaborate with other SMEs.
Investors	With the NewBEE, your company will have the best consultancy tool on efficient retrofitting, being informed about the last technologies, a »live« marketing channel and a platform on which you can set up temporary project – specific networks to collaborate with other SMEs.
Manufacturers of EE technologies	Through the NewBEE platform you will be able to increase your brand and product exposure to potential clients; building owners as

[5] ESCO: An **energy service company** or **energy savings company** (acronym: ESCO or ESCo) is a commercial or non-profit business providing a broad range of energy solutions including designs and implementation of energy savings projects, retrofitting, energy conservation, energy infrastructure outsourcing, power generation and energy supply, and risk management. *Source: Wikipedia*.

	well as contractors and consultants. It is an cost efficient and easy way to increase international market presence for your brand and products. You will also be able to learn details of future markets/other countries, place your products all over Europe and find new prospects.
Associations	NewBEE: For a better living environment. The NewBEE platform provides tools for the creation of new collaboration networks for retrofitting projects where the aim is to reduce the carbon footprint and increase financial efficiency to benefit owners, users and create business opportunities for service providers/construction companies.
Professional associations/networks active in the energy efficient retrofitting	In NewBEE you can find: • Support for identifying and creating business models for energy efficient retrofitting projects • Support for building the relevant expert and resources networks for energy efficient retrofitting projects • A comprehensive Data-Base containing documents related to the planning of the projects related to energy efficient retrofitting, best practice examples from all over Europe, information on new materials and processes, links to important web pages from related areas e.g. innovations, new technologies etc. • An Innovative ICT system, providing support in finding missing/complementary expertise and resources. • Portal for advertising your energy efficient projects.
Facility managers	You will find service providers whenever you need to consider energy efficiency improvement, i.e. planners, architects, energy specialists and pre-assessment tools to evaluate the best possible energy efficient measures for which you are responsible!
Tenants and users	You will find service providers whenever you need to consider energy efficiency improvement, i.e. planners, architects, energy specialists and pre-assessment tools to evaluate the best possible energy efficient measures for buildings in your ownership or rent!
EU Project Leaders, Networking with EU projects	NewBEE will develop the NewBEE system enabling SMEs to generate New performance based Business models for cost and Energy Efficient construction works with special incidence in retrofitting. NewBEE system will be composed of NewBEE methodology and ICT platform, including set of ICT tools. NewBEE identified project results are: • An ICT Platform (Pre-assessment tool, Business Model Assessment, Energy Performance Assessment), • A Technology Database, • A Consultancy System.
Research universities	NewBEE will develop the NewBEE system enabling SMEs to generate New performance based Business models for cost and Energy Efficient construction works with special incidence in retrofitting. NewBEE system will be composed of NewBEE methodology and ICT platform, including set of ICT tools.

	NewBEE identified project results are: • An ICT Platform (Pre-assessment tool, Business Model Assessment, Energy Performance Assessment), • A Technology Database, • A Consultancy System. It could be used as a case studies for new business models for energy retrofitting of buildings.
Financial Institutions	Put your Corporate Social Responsibility into practice by providing the necessary reasonable financial support for the creation of retrofitting projects which would benefit the environment and therefore Society at Large. Using NewBEE platform you will allow to have knowledge of return of investment and facilitate the decision making process.

STEP 3: <u>How</u> to disseminate (inform / involve)?

In the next step ("How") following dissemination methods and channels of the NewBEE project were defined:

- **NewBEE project website**
- **Printed and electronic** (email, Internet) **publications**.
- **NewBEE leaflet** in English, Spanish, German and Slovene language
- **NewBEE ppt presentation:** The reasons for new business models in construction
- **NewBEE video**
- **Articles in the scientific literature and dedicated journals** and reviews in the field of retrofitting, sustainable building, construction management, ICT, engineering and processes, etc. The list of key journals and e-publishing web portals will be defined in the first version of dissemination plan.
- NewBEE project was presented in a number of **international conferences** and workshops.
- **Educational and training materials**, such as **NewBEE Technology Wiki,** training courses for students, etc.
- **Person-to-person and person-to-business contacts**. The professional and business networks of NewBEE project partners (experts working in WPs) will be used for dissemination purposes, using their way of communication (LinkedIn, Facebook, email).
- **Clustering activities**: with other European related projects and the related European (ECTP & E2B, EUMAT, NESSI, RHC) and National Technology Platforms via project partners, targeted associations such as ECCREDI, ENCORD, FIEC, ACE, CIB, EUROCONSTRUCT, FIEC, etc.
- **Direct communications to the European Commission and its directorates**, associations, offices in the field of retrofitting, sustainable building and innovation

NewBEE project website gives access to all the aspects of the development activities, from research to exploitation. The aim is to stimulate and support active collaboration of interested stakeholders via different virtual social (LinkedIn) and working facilities (e-questionnaires). The completed website contains:

a) Project overview: basic facts, challenges, project objectives, methodology, results and envisioned impacts. The project overview will be place to targeted business, development and science context, but an easy-to-understand part will be devoted to general public;

b) Presentation of the NewBEE consortium and management structure: contact information and roles of partners, a map with geographical distribution of partners, organisational chart and rules for collaboration, including the external stakeholders;

c) Work programme and WPs presentation, including the planned public deliverables;

d) Business Cases (Case studies) presentation, their relevance to the project, and partners involved;

e) Media centre: public deliverables, scientific and other publications (downloadable, or links to publisher, journal), e-newsletter, brochures, videos, other multimedia materials will be available for downloading;

f) Events: information about future and past events related to NewBEE project activities and events on the NewBEE technological and business domains;

g) Collaborative working space: a window to collaborative tools (questionnaires, forums, LinkedIn), including a Wiki and a glossary of terms and abbreviations;

h) A private collaborative working space for project consortia (documents and task management), which will allow an effective collaboration.

http://www.newbee.eu/

Figure 19: NewBEE website

Figure 20: NewBEE website – navigation bar

Figure 21: NewBEE website – Platform

Figure 22: NewBEE website – wiki

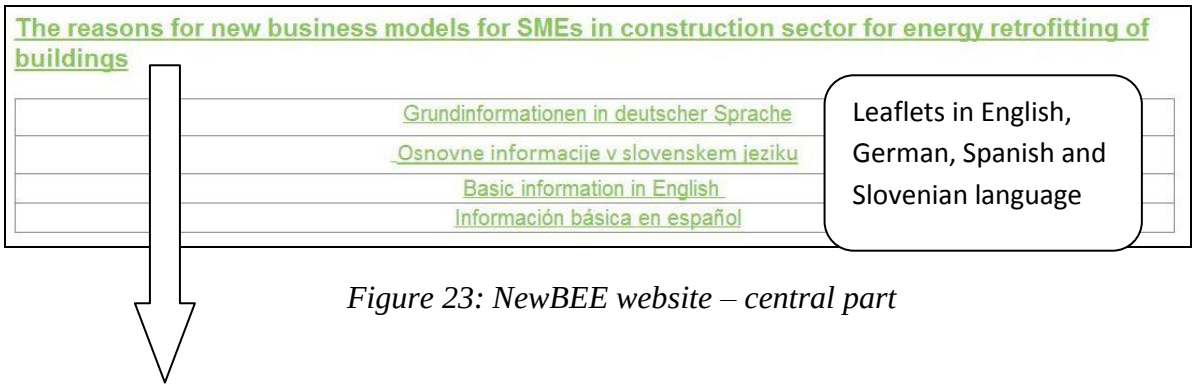


Figure 23: NewBEE website – central part

Figure 24: NewBEE website – link to the ppt presentation

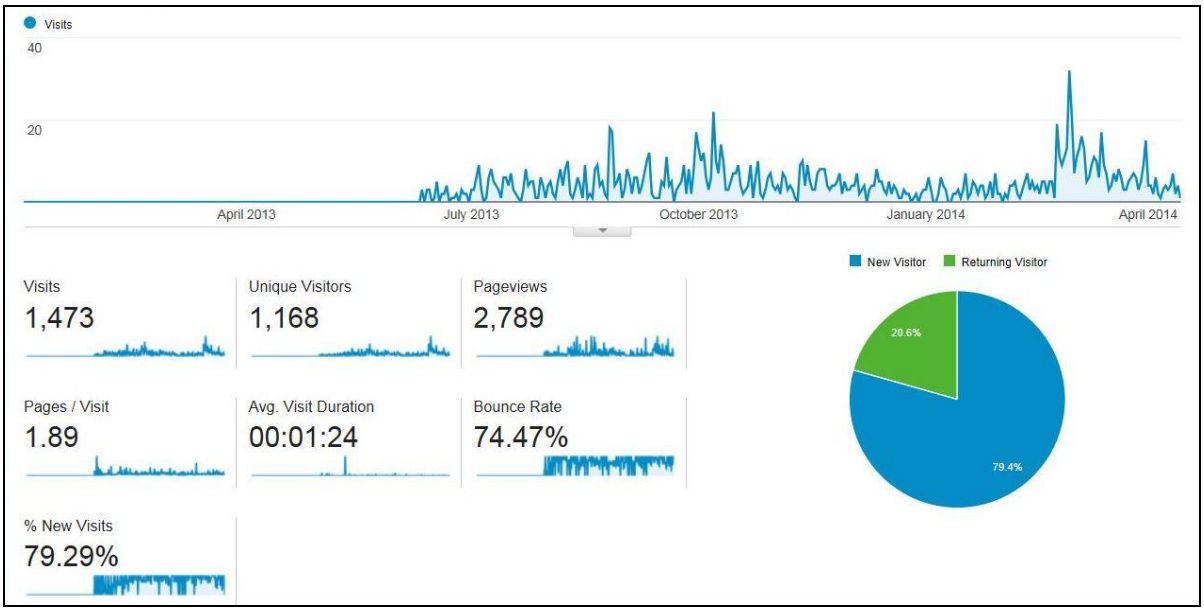


Figure 25: Google Analytics for NewBEE website

Until 14th April 2014 **1168** visitors have visited the NewBEE website:

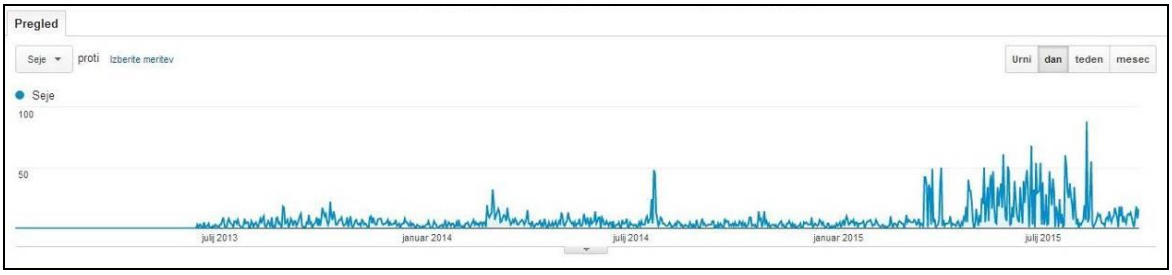


Figure 26: Google Analytics for NewBEE website

Until 24th September 2015 **5275** visitors have visited the NewBEE website.

The description of main other dissemination activities is presented in template A 1 and template A2.

TEMPLATE A1: LIST OF SCIENTIFIC (PEER REVIEWED) PUBLICATIONS, STARTING WITH THE MOST IMPORTANT ONES										
NO.	Title	Main author	Title of the periodical or the series	Number, date or frequency	Publisher	Place of publication	Year of publication	Relevant pages	Permanent identifiers[6] (if available)	Is/Will open access[7] provided to this publication?
1	Foundations of Sustainability	Javier del Pozo, Laura Garcia, Francisco Rodriguez Perez-Curiel	International innovation magazine	*Issue 148*	International innovation	International innovation magazine	*2014*	*3 (69 to 71)*		yes
2	Development of an assessment tool to evaluate and improve SME business models -	Stephan Schüle, Michael Schubert, Christian Hoyer and Klaus-Michael Dressel	Proceedings of the conference R&D Management Conference, Pisa, Italy		R&D Management Conference	Proceedings of the conference R&D Management Conference, Pisa, Italy	2015			no
3	ICT tools to foster	Fabio	Proceedings			Proceedings	2015			

[6] A permanent identifier should be a persistent link to the published version full text if open access or abstract if article is pay per view) or to the final manuscript accepted for publication (link to article in repository).

[7] Open Access is defined as free of charge access for anyone via Internet. Please answer "yes" if the open access to the publication is already established and also if the embargo period for open access is not yet over but you intend to establish open access afterwards.

	Small and Medium Enterprises collaboration in energy retrofitting sector	Disconzi	of International Conference on "Smart and Sustainable Planning for Cities and Regions 2015"			of International Conference on "Smart and Sustainable Planning for Cities and Regions 2015"				

TEMPLATE A2: LIST OF DISSEMINATION ACTIVITIES

NO.	Type of activities[8]	Main leader	Title	Date/Period	Place	Type of audience[9]	Size of audience	Countries addressed
1	Workshop	Across Limits	Retrofitting Old Buildings - a sensible business model for Malta?	*25 September 2015*	Mediterranean Conference Centre, Valletta, Malta	Architects, academics, designers, contractors, engineers, planning authorities, investors,	15	Malta
2	Workshop	SGG	Workshop "Clusters as a tool for construction sector development"	*23 September 2015*	Lodz, Poland	Construction sector, private entities (SMEs), public organizations (investors)	40	Poland
3	Workshop	GI-ZRMK	Presentation of the project and ICT platform	*9 September 2015*	MOS, International trade and business fair, Celje, Slovenia	Construction professionals	27	Slovenia

[8] A drop down list allows choosing the dissemination activity: publications, conferences, workshops, web, press releases, flyers, articles published in the popular press, videos, media briefings, presentations, exhibitions, thesis, interviews, films, TV clips, posters, Other.

[9] A drop down list allows choosing the type of public: Scientific Community (higher education, Research), Industry, Civil Society, Policy makers, Medias, Other ('multiple choices' is possible).

4	Conference	FHG	Development of an assessment tool to evaluate and improve SME business models	*23 – 26 June 2015*	RnD Management Conference, Pisa, Italy	entrepreneurs and managers of SMEs in the construction sector		
5	Conference (discussion about the role of energy efficiency and citizens awareness rising for energy efficiency)	UNIPD	L'energia dei cittadini. Rinnovabile, sostenibile, etica, condivisa	*20 June 2015*	L'energia dei cittadini. Rinnovabile, sostenibile, etica, condivisa , Padova, Italy	10 policy makers; 30 practitioners	40	Italy
6	Workshop	Tecnalia	Impact of the Energy efficient Buildings PPP: EeB.NMP.4	*27– 28 April 2015*	Brussels, Belgium	Project leaders	7	EU
7	Workshop	UNIPD	Presentation of energy efficiency potential	*15 April 2015*	Liceo Righi, Bologna, Italy	Students	60	Italy
8	Info Day	UNIPD	Enersys 2020 Info day; face to face discussion with stakeholders	*13 March2015*	Verona, Italy	Potential Stakeholders/ Clients	150	Italy
9	Conference	UNIPD	Cantiere Efficienza, an initiative of ANCE, National Association of Building Companies; face to face discussion with stakeholders	*17 November 2014*	Padova, Italy	30 policy makers 150 practitioners	180	Italy
10	Conference	FHG	R&D Management Conference 2014	*3– 6 June 2014*	ConferenceR&D Management Conference 2014, Stuttgart, Germany	220 delegates from more than 30 different countries (construction companies, educational organizations, academia)	220	EU
11	Workshop	Tecnalia	Workshop 2014: Impact of the Energy efficient Buildings	*1– 2 April 2014*	Brussels, Belgium	Project leaders and participants	70	EU

			PPP: EeB.NMP. 2012-3					
12	Conference	TEUSA	CONFERENCE CONTADORES	*26 February 2014*	Contadores Builging-San Sebastián, Spain	4 architects, 26 citizens, retrofittable building owners	30	Spain
13	Conference and exposition-fair	TEUSA	BERDEAGO; Relevance for NewBEE: to be known in the local and regional retrofitting strategy reinforcing the awareness in energetic efficiency technologies and strategies.	*24 - 26 Jannuary2014*	Contadores Builging-San Sebastián, Spain	policy makers, architects, public and private promoters, construction companies, technology suppliers, services companies, societal organizations, public and private owners, energy advisers, energy auditors, technology providers, citizens	more than 10.000 visitants and 41 expositors with very different profiles: technical offices, private and public owners, building administration (private and public), retrofitting enterprises and providers	Spain
14	Congress	ifA, Klaus-Michael Dressel	Presentation and Discussion of Concept and first results of NewBEE-Project under the "Summer-Congress" of the EBZ (European Building Center of the Housing Industry)	*18 July 2013*	Bochum, Germany	architects, public and private promoters, construction companies, technology suppliers, services companies, energy advisers, economic interest, technology	150	Germany

						providers, real estate companies, funds		
15	Conference	TEUSA	Technical Conference about energetic retrofitting in buildings: keys and opportunities	*19 June 2013*	Municipality Center for Enterprises, San Sebastian, Spain	technical staff, public administration, constructors, architects, citizens	50	Spain
16	Congress	ifA, Klaus-Michael Dressel	VdW-Forum : Presentation and Discussion of Concept and first results of NewBEE-Project under the "12th Forum Housing Industry" of VdW Rheinland Wesfalen	*19 June 2013*	Düsseldorf, Germany	architects, public and private promoters, construction companies, technology suppliers, services companies, energy advisers, economic interest, technology providers, real estate companies, funds	200	Germany
17	Conference	UNIPD	The "EnergiaE" conference was oriented to technical secondary school students and experts in the field of renewable energy. Speakers spoke about the role of renewable energies and energy efficiency in boosting the local economy.	*4 May 2013*	Vittorio Veneto, Italy	About 120 students of a technical secondary school, 20 citizens, 40 professionals and experts;	180	Italy
18	A 92-page booklet in 4	Tengbom	Tengbom Eriksson	2015		The target	The booklet	

	languages: English, Finnish, Swedish, and Chinese.		Architects' services and reference projects. NewBEE is featured in the Research and Development section.			groups are construction companies, public and private owners and real estate companies.	has been sent forward to tens of clients and potential clients, and will be broadly distributed in 2015 and 2016.	
19	E2B PPP Project Review 2014	Tecnalia	NewBEE project	2014		construction companies, research institutions, public sector		EU
20	E2B PPP Project Review 2013	Tecnalia	NewBEE project	2013		construction companies, research institutions, public sector		EU
21	Societal networks	SGG	LinkedIn group BUILD UP Skills	2015		construction companies, research institutions, public sector		EU
22	Website http://www.buildup.eu/	SGG	The BUILD UP web portal is intended to reap the benefits of Europe's collective intelligence on energy reduction in buildings for all relevant audiences. It will bring together new practitioners and professional associations while motivating them to	2015		The BUILD UP web portal targets professionals working in the building sector (public or private) with an interest on the latest developments at technical or practice level,		EU

			exchange best working practices and knowledge and to transfer tools and resources.			policy legislation, financial issues, etc.		
23	Website	SGG	Procurement FORUM / resource centre The Procurement Forum is managed by the European Secretariat of ICLEI-Local Governments for Sustainability, as part of the Procurement of Innovation Platform project financed by DG Enterprise and Industry – European Commission	2014		ICLEI – Local Governments for Sustainability is an international association of local governments and national and regional local government organisations that have made a commitment to sustainable development. Active for over 17 years in the field of Sustainable Procurement, it also hosts the Procura+ Sustainable Procurement Campaign, the Sustainable Procurement Resource Centre and the EcoProcura series of conferences.		

24	Website	SGG	NewBEE website http://www.newbee.eu/	2013 - 2018		construction companies, research institutions, public sector, building owners		EU
25	Video	tecnalia	NewBEE video (uploaded on the NewBEE website)	2015		construction companies, research institutions, public sector, building owners		EU
26	Lectures	FHG	Lecture at HFT Stuttgart. Transfer of Knowledge and identification of synergies between the European Projects Meefs and NewBee	2013, 2014	Stuttgart, Germany	students		Germany
27	Clustering activities	FHG	Morgenstadt – City of the Future« Innovation Network – Raising awareness and interexchange.	ongoing		Transfer of Knowledge and identification of sysnergies between the European Projects Meefs and NewBee		EU
28	Clustering activities	FHG	Meeting SEE (Stadt mit Energieeffizienz).	*29 April 2013*		Presentation of approach and concept of NewBEE.		Germany
29	Clustering activities	ifA	Energy-Forum Brixen	*5 – 6 November 2013*		Discussion with different experts w.r.t. “NewBEE in the context of “interdisciplinary planning”, integrative		Germany

						assessment of facades" and "increasing efficiency and sustainability through cooperation – Lean partnering".		
30	Clustering activities	Tengbom	KLIKK-research project.	*23– 24 May 2013*		(about infill construction & renovation, led by Oulu University) : May 23-24th, SB13 conference in Oulu, & September 17th, workshop in Espoo. Flyers and personal contacts.		Finland
31	Clustering activities	NewBEE partners	Around 30 more clustering activities, described in D 8.5	2013 - 2015		construction companies, research institutions, public sector, building owners		EU
32	Person to person contacts	NewBEE partners	Around 16 person to person (reported) dissemination activities, described in D 8.5	2013 - 2015		construction companies, research institutions, public sector, building owners		EU
33	International Conference on "Smart and Sustainable	UNIPD, Fabio Disconzi	ICT tools to foster Small and Medium Enterprises	19 November 2015	Bolzano, Italy		planned	EU

	Planning for Cities and Regions 2015”		collaboration in energy retrofitting sector					
34	CIB World Building Congress 2016	VTT, Tarja Hakkinen	The use of E-PASS Tool in the selection of the refurbishment methods	30 May – 3 June 2016	Tampere, Finland		planned	EU

Section B (Confidential[10])

Part B1

NewBEE project has not submitted applications for patents, trademarks or registered designs.

Part B2

Table below shows the list of exploitable results.

Type of Exploitable Foreground[11]	Description of exploitable foreground	Confidential Click on YES/NO	Foreseen embargo date dd/mm/yyyy	Exploitable product(s) or measure(s)	Sector(s) of application[12]	Timetable, commercial or any other use	Patents or other IPR exploitation (licences)	Owner & Other Beneficiary(s) involved
Commercial exploitation of R&D results	Integrated NewBEE Retrofitting Platform	YES		Internet based online platform	Construction industry, retrofitting, energy efficiency (NACE codes F41, F43, M71.1)	From October 2015 onwards	N/A	CONCLUDE, ATB, FhG, TEC, UNIPD, VTT, SMEs partners
General ad-vancement of knowledge	Consultancy based on NewBEE Methodology	YES		Implementation Methodology	Construction industry, retrofitting, energy efficiency (NACE codes F41, F43, M71.1)	From October 2015 onwards	N/A	TECNALIA, ATB, CON, FhG, UNIPD, VTT, SMEs partners
Exploitation of results through (social) innovation	NewBEE Knowledge Repository	NO		Knowledge Wiki	Construction industry, retrofitting, energy efficiency	From Y3 of project onwards	n/a	FHG, ATB, TEC, UNIPD, VTT, SMEs partners

[10] Note to be confused with the "EU CONFIDENTIAL" classification for some security research projects.

[11] A drop down list allows choosing the type of foreground: General advancement of knowledge, Commercial exploitation of R&D results, Exploitation of R&D results via standards, exploitation of results through EU policies, exploitation of results through (social) innovation.

[12] A drop down list allows choosing the type sector (NACE nomenclature) : http://ec.europa.eu/competition/mergers/cases/index/nace_all.html

Type of Exploitable Foreground[11]	Description of exploitable foreground	Confidential Click on YES/NO	Foreseen embargo date dd/mm/yyyy	Exploitable product(s) or measure(s)	Sector(s) of application[12]	Timetable, commercial or any other use	Patents or other IPR exploitation (licences)	Owner & Other Beneficiary(s) involved
					(NACE codes F41, F43, M71.1)			
Commercial exploitation of R&D results	Pre-assessment tool	YES		Online Tool	Construction industry, retrofitting, energy efficiency (NACE codes F41, F43, M71.1)	From October 2015 onwards		CONCLUDE, ATB, FhG, TEC, UNIPD, VTT, SMEs partners
Commercial exploitation of R&D results	Market place tool	YES		Online Tool	Construction industry, retrofitting, energy efficiency (NACE codes F41, F43, M71.1)	From October 2015 onwards		ATB, CON, SMEs partners
Commercial exploitation of R&D results	Energy Performance Assessment Tool.	YES		Online Tool	Construction industry, retrofitting, energy efficiency (NACE codes F41, F43, M71.1)	From October 2015 onwards		VTT, FINNERGIA

Exploitable foreground and its exploitation are described in detail in deliverables D8.4 and D8.6.

Exploitable Results Ownership

Table 6: Exploitable Results Ownership

Exploitable Result - Ownership	Main Partner	Other partners involved
Integrated NewBEE Retrofitting Platform	CONCLUDE	ATB, FHG, TEC, UNIPD, VTT, SME Partners
Consultancy based on NewBEE methodology	TECNALIA	ATB, CONC, FHG, UNIPD, VTT, SME Partners
NewBEE Knowledge Repository	FHG	ATB, TEC, UNIPD,VTT, SME Partners
Pre-assessment Tool	CONCLUDE	ATB, FHG, TEC, UNIPD, VTT, SME Partners
Market Place Tool	ATB	CON, SME Partners
Energy Performance	VTT	FINNERGIA

Exploitable result Characterization

A summary of the characterization of the exploitable foreground is provided in the tables below:

Table 7: Characterization of NewBEE Retrofitting Platform

Result Number	**Name of the result**
1	**Integrated NewBEE Retrofitting Platform**
Purpose	Online ICT Platform that provides several services to building owners and SMEs (companies in the construction and retrofitting value chain).
Who will be the customer?	Building owners and European retrofitting SMEs: contractors, ESCOs, public authorities, architects, SME in the retrofitting sector, investors, financial institutions, business networks, associations.
What benefit will it bring to the customers?	It will integrate under a unique platform (one-stop-shop) all the required tools for SMEs to boost their retrofitting business: collaborative environment to share knowledge and experience; technologies repository; pre-assessment tool; financial calculation tool; market place tool to find partners for a retrofitting project; energy performance tool; business model

	assessment tool; new organizational models; available financial schemas. It will provide easily accessible and scalable tools for building owners (users) to pre-assess the costs/benefits ratio (for the energy-efficient building retrofitting projects) and the payback period and for the SMEs to identify retrofitting Business Opportunities.
When is the time to market (Short, Medium or Long term)?	Medium (6 to 9 months after the project ends)
How this result will rank against competing products in terms of price / performance?	Competing products are single stand-alone tools, not integrated in a system. For example, tools for energy (pre)assessment: EnergyPlus, WinEtana, MX6 (by Building Information foundation, for E-value calculation) and the E-value calculator by Lamit company in Finland. However the most important competitor would be the free tool available on www.korjaustieto.fi
Who are the partners involved in this result?	CONCLUDE, ATB, FhG, TEC, UNIPD, VTT, SMEs partners
Who are the industrial partners interested in the result (partners, sponsors, etc.)?	CONCLUDE mostly with the others as secondary

Table 8: Characterization of Consultancy based on NewBEE Methodology

Result Number	**Name of the result**
2	**Consultancy based on NewBEE Methodology**
Purpose	SMEs will use the knowledge acquired to help their clients (building owners) in the creation of retrofitting projects. RTDs and associations of SMEs (IFA and SGG) will use the knowledge acquired to offer consultancy services based on the NewBEE Methodology to their customers (SMEs).
Who will be the customer?	Building Owners: SME may offer consultancy services to the building owners that for example are looking for turn-key retrofitting solutions. SMEs in the construction industry willing to improve their business strategy or willing to transform their business.
What benefit will it bring to the customers?	It will improve business practices due to the methodology and the platform supporting it

	It will increase retrofitting knowledge base It will boost strategic networks and partnerships It will bring new methodologies which did not exist for the market
When is the time to market (Short, Medium or Long term)?	Medium (6 to 9 months after the project ends)
How this result will rank against competing products in terms of price / performance?	There are different consulting companies that offer strategic business consultancy for SMEs in the construction industry, however none use a similar knowledge gained from such an integrated platform
Who are the partners involved in this result?	TECNALIA, ATB, CON, FhG, UNIPD, VTT, SMEs partners
Who are the industrial partners interested in the result (partners, sponsors, etc.)?	ALL industrial partners

Table 9: Characterization of NewBEE Knowledge Repository

Result Number	**Name of the result**
3	**NewBEE Knowledge Repository**
Purpose	Online accessible country/region specific repository with information on refurbishment technologies, evaluated energy saving schemes, financial models and business models.
Who will be the customer?	Building owners and SMEs: construction companies, planners, architects, public bodies and financial institutions who get clients who ask for such help before building or refurbishing a building and would need such information
What benefit will it bring to the customers?	Having such a structured data (wiki-like) concerning retrofitting technologies used in different trades being made accessible to building owners, makes it familiar enough to be understood and assessed by them. In addition, the technology repository can be used as a starting point for discussions between building owner and principal designer/architect.
When is the time to market (Short, Medium or Long term)?	Short (1 to 2 months after the project ends)
How this result will rank against competing products in terms of price / performance?	The NewBEE Wiki will be available free of charge after project end. There are other free databases for refurbishment technologies like: - http://ws680.nist.gov/Bees - http://www.masea-ensan.de/

	There is also a competitor on national level (Germany): - https://www.effizienzhaus-online.de/
Who are the partners involved in this result?	FHG, ATB, TEC, UNIPD, VTT, SMEs partners
Who are the industrial partners interested in the result (partners, sponsors, etc.)?	ALL industrial partners

Table 10: Characterization of Pre-assessment tool y

Result Number	**Name of the result**
4	**Pre-assessment tool**
Purpose	Online tool that will be used by the building owner for the purpose of investigating different technology scenarios that might be appropriate to address the building problem at hand (taking into account e.g. building characteristics, local climatic conditions etc.) and for getting an estimation of the costs, the payback period, the return on investment, together with the list of possible (co)financing.
Who will be the customer?	Building owners and European retrofitting SMEs: contractors, ESCOs, public authorities, architects, SME in the retrofitting sector, investors, financial institutions, business networks, associations.
What benefit will it bring to the customers?	It will provide easily accessible and upgradable tool for building owners (users) to pre-assess the costs/benefits ratio (for the energy-efficient building retrofitting projects) and the payback period. It will provide an engagement tool for building owners to publish their "Business Opportunity" in the marketplace. Also it could be used by the retrofitting SME as a commercial tool to show the owner the different retrofitting possibilities (technical and economic).
When is the time to market (Short, Medium or Long term)?	Medium (6 to 9 months after the project ends)
How this result will rank against competing products in terms of price / performance?	Professional tools aimed to be used by the retrofitting SME as they are complex and require a very specific knowledge in order to be used.
Who are the partners involved in this result?	CONCLUDE, ATB, FhG, TEC, UNIPD, VTT, SMEs partners

Who are the industrial partners interested in the result (partners, sponsors, etc.)?	CONCLUDE mostly with the others as secondary

Table 11: Characterization of Market Place tool

Result Number	**Name of the result**
5	**Market Place tool**
Purpose	Online tool that will be used by the building owner to publish a call for proposals for a building retrofitting project, which (call) becomes a Business Opportunity for the SME Market Place´s members. It will be also used by SME´s members to find other partner SMEs which are suitable and willing to join a Business Opportunity initiated by the building owner (i.e. launching of an energy retrofitting project) with a precisely defined collaboration goals and conditions. The search is done based on several criteria, such as the potential members' expertise, resources, location, etc…
Who will be the customer?	Building owners and European retrofitting SMEs: contractors, ESCOs, public authorities, architects, SME in the retrofitting sector, investors, financial institutions, business networks, associations.
What benefit will it bring to the customers?	It will be a holistic solution for the retrofitting value chain stakeholders, enabling building owners to access the tool for publishing a call for proposals for a building retrofitting project, and SMEs to identify business opportunities, to create collaborative networks. It will provide an easily accessible tool for retrofitting SMEs where they can find proposed projects to send project offers and partners to work with.
When is the time to market (Short, Medium or Long term)?	Short (2 to 6 months after the project ends)
How this result will rank against competing products in terms of price / performance?	General tools for searching for project partners such as: http://www.my-hammer.de where however business opportunities are not listed
Who are the partners involved in this result?	ATB, CON, SMEs partners
Who are the industrial partners interested in the result (partners, sponsors, etc.)?	ATB and CONCLUDE mostly with the others as secondary

Table 12: Characterization of Energy Performance Assessment tool

Result Number	**Name of the result**
6	**Energy Performance Assessment tool**
Purpose	Online tool that will be used by SMEs to compute the energy consumption of the building applying simulation tools such as e.g. calculation method, based on the simple single zone steady-state thermal analysis, taking into account previously identified building types' characteristics and different region/country specifics. It is intended to be used by SMEs to offer professional support for building owners in decision making.
Who will be the customer?	Building owners and European retrofitting SMEs: contractors, ESCOs, public authorities, architects, SME in the retrofitting sector, investors, financial institutions, business networks, associations.
What benefit will it bring to the customers?	The advantage of this product is its accuracy in the energy saving potential estimation.
When is the time to market (Short, Medium or Long term)?	Short (2 to 6 months after the project ends)
How this result will rank against competing products in terms of price / performance?	There are several easy-to-use and simple tools available but most of them fit best for new buildings and only few are available as web-based services. The challenge in the use of assessment tools for existing buildings is based on the need to model the existing buildings. Tools are available for E-value calculation such as MX6 (by Building Information foundation) and the E-value calculator by Lamit company in Finland. However, from the competition point of view, the usability and the overall service process of the tool is important. In Finland, the most important competitor would be the free tool available on www.korjaustieto.fi. However, the tool is not a real simulation tool and the user is not able to modify the initial data in order to improve the accuracy of the assessment result.
Who are the partners involved in this result?	VTT, FINNERGIA
Who are the industrial partners interested in the result (partners, sponsors, etc.)?	VTT, FINNERGIA, SME partners

Potential and expected impact

Concerning the potential and expected impact, the following table summarizes the innovation aspects and the added value associated to each of the exploitable foreground.

Table 13: Potential and expected impact

Result - Component	Innovation	Added value
Integrated NewBEE Retrofitting Platform	NewBEE provides a tailored Collaborative Working Environment (CWE) for the retrofitting value chain (mainly SME, RTD and building owners) to cooperate to create a shared Energy Performance based Business Models.	In a unique environment users can access knowledge repository, pre-assessment tool, financial tool, and a professional energy assessment tool needed to evaluate the potentiality of the business. Online ICT tools assisting users to make informed decisions and saving money.
Consultancy based on NewBEE Methodology	The knowledge gained in the project is able to be given as consultancy services by the partners using the NewBEE Methodology, to their customers supported by the NewBEE Retrofitting platform services. The innovation is: • Use knowledge about best retrofitting technologies • For Construction Companies finding new business opportunities over the NewBEE platform • Making Self-assessment tool for business models in the construction industry	Raise awareness of the whole process for the clients (educating clients); support decision making (architects --> clients) Knowledge how to finance retrofitting projects. Boost strategic networks and partnerships
NewBEE Knowledge Repository	The repository (retrofitting technologies, energy saving schemes, and business model schemes) is offered as an open tool, and therefore is accessible by all the potential users (building owner and all the value chain stakeholders).	Repository contains structured knowledge as for example energy saving schemes, country specific legislation and financial incentives, and information on financial and business

		models which will be provided to both, building owners and professionals.
Pre-assessment tool	This tool provides an easy-to-use tool aimed not only to professionals but also and mainly to the general public (building owners). This is a comprehensive tool that allows the building owners to approach the retrofitting business, in terms of technical possibilities, costs of the different solutions and the expected payback period and return on investment. It is designed to be a kind of retrofitting project "hunter", i.e. a kind of tool that attracts building owners, engages them and leads them to publish their "Business Opportunity" in the market place.	When an SME needs a rough feasibility study of a project i.e. estimation of the necessary resources and profitability of the project, this can be achieved by applying this tool. In addition, the tool can be used as a starting point for discussions between building owner and principal designer/architect in order to generate interest in energy efficiency retrofitting.
Market place tool	This tool provides an infrastructure tailored for the retrofitting value chain stakeholders, focussed on the needs of building owners, SMEs and related RTD performers.	The Market place tool supports identification of the appropriate business opportunities and creation of Virtual Collaborative Networks (virtual project teams) of SMEs which is one of the current market trends. It allows for rather realistic optimism in expectations of high acceptance in the related community.
Energy Performance Assessment Tool.	This tool provides a precise and professional energy assessment of a building. This is intended to be used by expert users who can use it in order to provide a precise energy calculation of the expected energy saving after the different retrofitting possibilities. It is intended to be used as a support for consultancy services.	It provides accuracy in the energy saving potential estimation. In big refurbishment projects it is common to provide consultancy services beforehand to measure the energy saving potential and the expected

		payback period and ROI of the different solutions. This tool will be a key to provide these kinds of consultancy services.

Exploitation Strategy

The exploitation strategy was drafted early on in the project so that the different exploitable assets were well defined and evaluated as well as agreed upon by all the partners in the project. This ensured that all the partners knew what their ultimate objective was and what they are ultimately benefitting from once the project is over and commercialisation takes place.

The NewBEE exploitation action plan updated the information contained in the exploitation strategy and detailed the post-project actions to be developed for the successful exploitation of the project assets, including the individual partner´s exploitation plans, the ownership and revenue sharing agreements and any future effort which may be required in terms of Research and Development.

All the details related to ownership of knowledge, pre-existing know-how for the project, access rights & future licenses for exploitation and protection of the knowledge were initially defined in the Consortium Agreement (CA). At the beginning of the project, the CA has indicated initially a royalty strategy for the post-project NewBEE results commercialization.

The consortium defined the guideline to follow as the common exploitation strategy to identify the project exploitable results and their exploitation including any IPR strategy in a clear way throughout and after the project. A number of steps (referred to as the strategy) were defined so that the process was well structured and clear not only for the benefit of all the partners but also to make sure that a good final exploitation action plan is presented at the end of the project. The steps that were defined and that have been refined along the project lifetime are:

Step 1: Identify Project exploitable results

Before defining ownership and third parties, the project results were clearly identified.

Step 2: Project exploitable results description

Characterize each of those assets: unique selling point, market size, competitors, time to market, partners that contribute to the asset, and so on. Once all the exploitable results were identified, each project result was identified through:

- A Short description of the asset;
- The Innovativeness introduced compared to already existing Products/Services;
- The Legal, normative and ethical requirements (need for authorisations, compliance to standards, norms, etc.);

All these issues are included in the characterization table for each asset.

Step 3: Define the lead partner and the contributors of each project exploitable result

A main partner has been identified to coordinate the actions for each exploitable result. The exploitation task presents different ways of managing the project results and the consortium defined the ownership in each result.

Partners must be aware of the responsibilities that an exploitation of an ICT asset involves:

- Development of future versions;
- Maintenance of software, databases and servers;
- Support of vendors in general;
- Other additional responsibilities in relation to the specific result (help in the future marketing, definition of the prices, etc.).

The main partner also coordinates the identification of the preferred Exploitation Forms e.g. direct industrial use, patenting, technology transfer, license agreement, publications, standards, etc. and if the partner commercializes the result directly or through external vendors to the project's consortium. Each partner indicates which the potential vendors of the results could be, this can be: organizations, spin-offs, and so on.

Besides the main partner identification, the consortium identified the following issues which are included in the characterization table for each asset:

- The contribution by partners;
- Adequateness of Consortium Staff;
- External Experts/Partners to be involved;

The partnership worked on the Contribution – Benefit matrix that served to identify the contribution of each partner to each asset. At the end of the project this has been then reflected in the Ownership and Revenue Sharing Agreements (ORSA).

This issue is included in the characterization table for each asset.

Step 4: Partners Expectations

For every asset, partners willing to go to the market were identified, together with the nature of any activity foreseen for the same asset..

The Consortium partners can be divided in three classes of partners:

- Partners interested in bringing into the market the project results: CONCLUDE, ATB, FhG TECNALIA, UNIPD, VTT, SGG and IFA.
- Partners interested in an internal use of the project results: the rest of NewBEE partners. These partners have special conditions in this internal use, and these conditions are written in the Ownership and Revenue Sharing Agreements..
- Partners who are interested in exploiting results within their circles and act as possible 'brokers' in commercialising the assets.

The "Partner/s involved expectations" issue is included in the characterization table for each asset.

Step 5: IPR Strategy and Ownership Rights

In this Exploitation Strategy step the consortium defined an active policy of protecting IP where applicable and the Ownership rights for the different exploitable results.

Considering the nature of activity foreseen for each result and the status with regards to the exploitation right from partners which have been identified in previous step, the consortium discussed more on the different IPR strategies and on the Ownership rights, focusing on:

- Who can use each result and under which rights (possibilities to licensing to third parties, use of the results only internally in the company, etc.).
- An individual consortium member can claim the ownership of a particular projects result and give other project partners licence free exploitation rights for particular time frame or geographical location;
- An individual consortium member can consider selling or transferring its ownership of a particular project's exploitable asset to another member within the consortium or else to an external party after considering the right of first refusal by the partners within the consortium.
- An individual consortium member can sell the asset to an external party after informing the asset owner. In this case a fee structure has also been established when commercialising any of the exploitable assets.
- A new spin-off company might be established by a group of NewBEE project partners. The ownership and IPR (if any) are transferred to this new legal structure which protects the knowledge, commercialise the results and manage the licensing and distribution of revenues resulting from exploiting results by this company or third parties.

This was particularly important for the ICT related results (results number 1, 4, 5 and 6) where the IPR/Ownership strategy were decided by the consortium.

For those results which are knowledge-based (results number 2 and 3), the consortium agreed on transferring the exploitation rights to the partner who wants to exploit it.

The following issues are included in the characterization table for each asset:

- Status of IPR/Ownership: Background;
- Status of IPR/Ownership: Foreground;
- Status of IPR/Ownership: Exploitation Forms

Besides that, a detailed analysis of the partners' expectations, nature of activity foreseen for each result, and the status of the exploitation rights is included in a dedicated section of this document.

The IPR strategy for each of the identified assets has been refined and included in this *D8.6 Exploitation Action Plan*.

Step 6: Target Market identification

The target market identification aimed to address specific organizations which can benefit of the NewBEE exploitable results, in an economic sustainable way for the partners. These are "potential customers" with needs that can be fulfilled by services based on NewBEE outcomes, provided by partners of this consortium.

The target market can be defined as a set of buyers sharing common needs or characteristics that we decide to service. In order to determine who our target market is, there are three key factors:

- Segment size and growth
- Segment structural attractiveness
- Businesses objectives and resources

The six steps process showed in the figure below is used as a rational to select the target markets:

Source: Phillip Kotler and Gary Armstrong, *Principles of Marketing*, 9th ed. (Upper Saddle River, NJ: Prentice Hall, 2001), p.245.

Figure 27: Process to identify the target market

The next steps to this market segmentation were the *market targeting* and *market positioning* that was made by characterizing each asset with the following issues included in the characterization table:

- Unique Selling Point (USP) / competitive advantages;
- Product/Service Market Size;
- Market Trends/Public Acceptance;
- Product/Service Positioning;
- Competitors;
- Prospects/Customers;

Step 7: Business Plan for each result

Finally a Business Plan for each of the identified results was elaborated, where the business model, pricing policy, the expected market share and the operational costs were identified. The following issues that characterize the business plan of each asset are included in the characterization table for each asset

- Cost of Implementation (before Exploitation);
- Time to market;
- Foreseen Product/Service Price;
- Sources of financing foreseen after the end of the project;

These issues were elaborated and included in this Exploitation Action Plan.

Step 8: Analyse the Risk Factors

Identify potential risk factors and obstacles which could lead to the fact that the identified results of the project would remain unexploited and propose potential interventions in order to provide remedial actions which may neutralize the risk factor.

Recommendations to mitigate risk factors are provided.

Step 9: Exploitation Plan per partner

Individual Exploitation Plans for the identified results were elaborated where each and every partner explored the possibilities of any exploitation activities. Other possibilities for the exploitation of the assets in a non-commercial way as the use for internal purposes were also discussed.

SWOT Analysis

A general SWOT analysis for the whole project has been generated as part of the initial assessment where the Strengths, Weaknesses, Opportunities and Threats were mapped out accordingly as shown in the following table.

The aim of the SWOT analysis is to identify potential problems before they occur, so that risk-handling activities may be planned as needed along the life of the project to mitigate adverse impacts on achieving the objectives.

	HELPFUL	HARMFUL
INTERNAL ORIGIN	**STRENGTHS** • Innovative solutions • Assets are diverse and can be customised for different client types • Scalable solutions with respect to size of market • Integration of the tools in a Whole Platform • Scenarios in line with the key trends in construction sector	**WEAKNESS** • Complex solution – both to build and to explain to construction professionals and architects • System has only been tested on a limited number of test cases • Challenges in deployment due to the business cultural barriers related to accessing potentially useful information • Time needed to involve other potential industrial users
EXTERNAL ORIGIN	**OPPORTUNITIES** • Higher awareness of Energy saving in the building and housing community • Pricing of retrofitting will go down in time • New business opportunities for construction sector • Knowledge/experience exchange among partners	**THREATS** • Potential competitors from other projects or companies having already a similar part of the solution • Current financial crisis means construction industry is sometimes in stasis • At this project is strongly construction sector driven, with heavy participation of industrial expert

Return of Investment

In order to calculate the ROI of the NewBEE platform, we have made the following suppositions:

- Number of estimated licenses per year
- Average sale price (depending on the number of modules the price is different)
- Cost of software developments (improvements + maintenance)
- Cost of marketing
- No cost for customization (localization of the different tools) have been taken into account

The figures show that the Progressive ROI will be positive after the year 1 or in other words, the Consortium will need 2 years more or less before obtaining net incomes.

ROI ANALYSIS	NewBEE			
	Year 1	Year 2	Year 3	Year 4
Number of platform licenses	1	2	3	3

	Year 1	Year 2	Year 3	Year 4
Sales of platform	150.000	300.000	450.000	450.000
Maintenance (10% p.a. cumulated)	15.000	30.000	45.000	45.000
Incomes	165.000	330.000	495.000	495.000
Expenses	235.000	150.000	158.750	182.188
R&D (SW development)	60.000	75.000	93.750	117.188
Materials (not relevant)				
Travels (paid by customer)				
Commercial Expenses	25.000	25.000	25.000	25.000
Cost of Implementation (per year)	150.000	50.000	40.000	40.000
Balance ROI	-70.000	180.000	336.250	312.813
Progressive ROI	-70.000	110.000	446.250	759.063

	Platform
Average Price	150.000
Maintenance Percentage	10
New People in R&D (Year 1)	1
Person Cost (R&D or implementer)	60.000
Marketing Cost per year	25.000
Cost of Implementation (year 1 - before exploitation)	150.000

Annual Increase	25%	
(per year)		

Figure 28: Progressive ROI

STRATEGIES IN CANVAS BUSINESS MODEL

The definition of this business model is centred in next aspects:

- Key Partners
- Key Activities
- Key Resources
- Value propositions
- Customer Relationships
- Customer Segments
- Channels

- Cost Structure
- Revenue Streams

The objective of using the CANVAS Business Model is to find the main value proposition and the main viable result to be launched in the market. The CANVAS Model will guide the release to the market of the NewBEE system. After some information interchanges between partners and the final approval from the NewBEE Consortium, the obtained CANVAS Model is the following one:

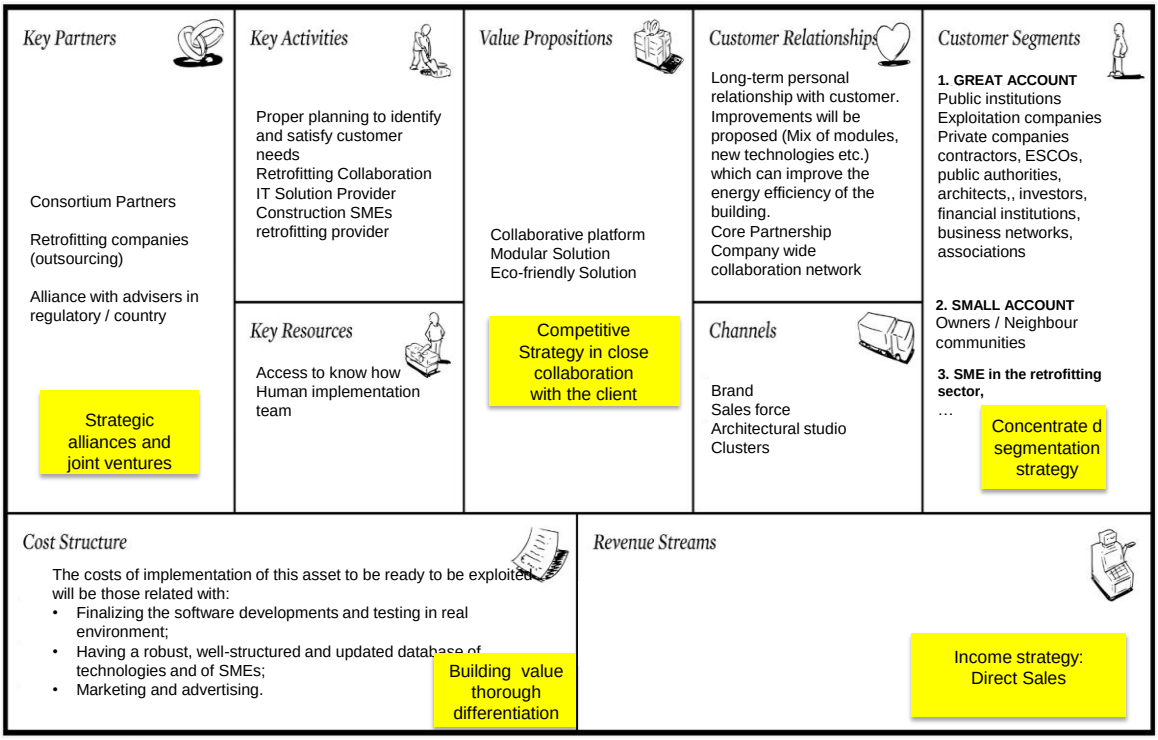


Figure 29: CANVAS Business Model

As for the final step of the exploitation strategy, an Individual Exploitation Plan for each partner were elaborated taking into account the exploitation discussions held in the consortium meetings where each and every partner explored the possibilities of any exploitation activities. Other possibilities for the exploitation of the assets in a non-commercial way as the use for internal purposes were also discussed.

Each partner elaborated an individual exploitation plan according to its expectations and exigencies. The objectives of this plan are to attract more customers, boost sales, to highlight new products, better coverage and display of products, etc. With this in mind, all partners have come up with their refined plans during the last two project meetings where they reviewed them and final decisions were communicated and put forward.

Some partners feel that they are not the right candidates to enter into commercialisation agreements with any interested third party. Other partners could be more interested to use the exploitable assets for their internal own use, in particular research while other partners are interested in the pure commercialisation aspect of the assets in different ways.

4.3 Report on societal implications

Replies to the following questions will assist the Commission to obtain statistics and indicators on societal and socio-economic issues addressed by projects. The questions are arranged in a number of key themes. As well as producing certain statistics, the replies will also help identify those projects that have shown a real engagement with wider societal issues, and thereby identify interesting approaches to these issues and best practices. The replies for individual projects will not be made public.

A General Information *(completed automatically when **Grant Agreement number** is entered.*	
Grant Agreement Number:	314326
Title of Project:	Novel Business model generator for Energy Efficiency in
Name and Title of Coordinator:	Javier del Pozo, Project manager

B Ethics	
1. Did your project undergo an Ethics Review (and/or Screening)? • If Yes: have you described the progress of compliance with the relevant Ethics Review/Screening Requirements in the frame of the periodic/final project reports? Special Reminder: the progress of compliance with the Ethics Review/Screening Requirements should be described in the Period/Final Project Reports under the Section 3.2.2 *'Work Progress and Achievements'*	***No***
2. Please indicate whether your project involved any of the following issues (tick box) :	
RESEARCH ON HUMANS	
• Did the project involve children?	No
• Did the project involve patients?	No
• Did the project involve persons not able to give consent?	No
• Did the project involve adult healthy volunteers?	No
• Did the project involve Human genetic material?	No
• Did the project involve Human biological samples?	No
• Did the project involve Human data collection?	No
RESEARCH ON HUMAN EMBRYO/FOETUS	
• Did the project involve Human Embryos?	No
• Did the project involve Human Foetal Tissue / Cells?	No
• Did the project involve Human Embryonic Stem Cells (hESCs)?	No
• Did the project on human Embryonic Stem Cells involve cells in culture?	No
• Did the project on human Embryonic Stem Cells involve the derivation of cells from Embryos?	No
PRIVACY	
• Did the project involve processing of genetic information or personal data (eg. health, sexual lifestyle, ethnicity, political opinion, religious or philosophical conviction)?	No
• Did the project involve tracking the location or observation of people?	No
RESEARCH ON ANIMALS	
• Did the project involve research on animals?	No
• Were those animals transgenic small laboratory animals?	No
• Were those animals transgenic farm animals?	No
• Were those animals cloned farm animals?	No
• Were those animals non-human primates?	No

RESEARCH INVOLVING DEVELOPING COUNTRIES	
• Did the project involve the use of local resources (genetic, animal, plant etc)?	No
• Was the project of benefit to local community (capacity building, access to healthcare, education etc)?	No
DUAL USE	
• Research having direct military use	No
• Research having the potential for terrorist abuse	No

C Workforce Statistics

3. Workforce statistics for the project: Please indicate in the table below the number of people who worked on the project (on a headcount basis).

Type of Position	Number of Women	Number of Men
Scientific Coordinator	1	1
Work package leaders	4	5
Experienced researchers (i.e. PhD holders)	12	17
PhD Students	2	5
Other	4	9

4. How many additional researchers (in companies and universities) were recruited specifically for this project?	**10**
Of which, indicate the number of men:	7

D Gender Aspects

5. Did you carry out specific Gender Equality Actions under the project?

○	Yes
x	No

6. Which of the following actions did you carry out and how effective were they?

	Not at all effective				Very effective
❑ Design and implement an equal opportunity policy	○	○	○	○	○
❑ Set targets to achieve a gender balance in the workforce	○	○	○	○	○
❑ Organise conferences and workshops on gender	○	○	○	○	○
❑ Actions to improve work-life balance	○	○	○	○	○

○ Other:

7. Was there a gender dimension associated with the research content – i.e. wherever people were the focus of the research as, for example, consumers, users, patients or in trials, was the issue of gender considered and addressed?

○ Yes- please specify

x No

E Synergies with Science Education

8. Did your project involve working with students and/or school pupils (e.g. open days, participation in science festivals and events, prizes/competitions or joint projects)?

X Yes- please specify : The "EnergiaE" conference was oriented to technical secondary school students and experts in the field of renewable energy. Speakers spoke about the role of renewable energies and energy efficiency in boosting the local economy.

○ No

9. Did the project generate any science education material (e.g. kits, websites, explanatory booklets, DVDs)?

○ Yes- please specify

x No

F Interdisciplinarity

10. Which disciplines (see list below) are involved in your project?

x Main discipline[13]:

○ Associated discipline[13]: ○ Associated discipline[13]:

G Engaging with Civil society and policy makers

11a Did your project engage with societal actors beyond the research community? *(if 'No', go to Question 14)*

○	Yes
x	No

11b If yes, did you engage with citizens (citizens' panels / juries) or organised civil society (NGOs, patients' groups etc.)?

x No

○ Yes- in determining what research should be performed

○ Yes - in implementing the research

○ Yes, in communicating /disseminating / using the results of the project

[13] Insert number from list below (Frascati Manual).

11c In doing so, did your project involve actors whose role is mainly to organise the dialogue with citizens and organised civil society (e.g. professional mediator; communication company, science museums)?	○ x	Yes No

12. Did you engage with government / public bodies or policy makers (including international organisations)

- x No
- ○ Yes- in framing the research agenda
- ○ Yes - in implementing the research agenda
- ○ Yes, in communicating /disseminating / using the results of the project

13a Will the project generate outputs (expertise or scientific advice) which could be used by policy makers?

- ○ Yes – as a **primary** objective (please indicate areas below- multiple answers possible)
- ○ Yes – as a **secondary** objective (please indicate areas below - multiple answer possible)
- x No

13b If Yes, in which fields?

Agriculture		Energy		Human rights	
Audiovisual and Media		Enlargement		Information Society	
Budget		Enterprise		Institutional affairs	
Competition		Environment		Internal Market	
Consumers		External Relations		Justice, freedom and security	
Culture		External Trade		Public Health	
Customs		Fisheries and Maritime Affairs		Regional Policy	
Development Economic and Monetary Affairs		Food Safety		Research and Innovation	
		Foreign and Security Policy		Space	
Education, Training, Youth		Fraud		Taxation	
Employment and Social Affairs		Humanitarian aid		Transport	

13c If Yes, at which level?

- ○ Local / regional levels
- ○ National level
- ○ European level
- ○ International level

H Use and dissemination

14. How many Articles were published /accepted for publication in peer-reviewed journals?	**3**
To how many of these is open access[14] provided?	**1**
How many of these are published in open access journals?	
How many of these are published in open repositories?	**1**
To how many of these is open access not provided?	**2**
Please check all applicable reasons for not providing open access:	
x publisher's licensing agreement would not permit publishing in a repository ❑ no suitable repository available ❑ no suitable open access journal available ❑ no funds available to publish in an open access journal ❑ lack of time and resources ❑ lack of information on open access ❑ other[15]: ……	

15. How many new patent applications ('priority filings') have been made? *("Technologically unique": multiple applications for the same invention in different jurisdictions should be counted as just one application of grant).*		**0**
16. Indicate how many of the following Intellectual Property Rights were applied for (give number in each box).	Trademark	**0**
	Registered design	**0**
	Other	**0**
17. How many spin-off companies were created / are planned as a direct result of the project?		**0**
Indicate the approximate number of additional jobs in these companies:		

18. Please indicate whether your project has a potential impact on employment, in comparison with the situation before your project:

x	Increase in employment, or	x	In small & medium-sized enterprises
x	Safeguard employment, or	❑	In large companies
❑	Decrease in employment,	❑	None of the above / not relevant to the project
❑	Difficult to estimate / not possible to quantify		

19. For your project partnership please estimate the employment effect resulting directly from your participation in Full Time Equivalent (*FTE = one person working fulltime for a year*) jobs:	*Indicate figure:*

[14] Open Access is defined as free of charge access for anyone via Internet.
[15] For instance: classification for security project.

Difficult to estimate / not possible to quantify	X

I Media and Communication to the general public

20. As part of the project, were any of the beneficiaries professionals in communication or media relations?

○ Yes x No

21. As part of the project, have any beneficiaries received professional media / communication training / advice to improve communication with the general public?

○ Yes x No

22 Which of the following have been used to communicate information about your project to the general public, or have resulted from your project?

X	Press Release	X	Coverage in specialist press
❑	Media briefing	X	Coverage in general (non-specialist) press
❑	TV coverage / report	X	Coverage in national press
❑	Radio coverage / report	❑	Coverage in international press
X	Brochures /posters / flyers	X	Website for the general public / internet
X	DVD /Film /Multimedia	X	Event targeting general public (festival, conference, exhibition, science café)

23 In which languages are the information products for the general public produced?

❑	Language of the coordinator	X	English
❑	Other language(s)		

***Question F-10*:** Classification of Scientific Disciplines according to the Frascati Manual 2002 (Proposed Standard Practice for Surveys on Research and Experimental Development, OECD 2002):

FIELDS OF SCIENCE AND TECHNOLOGY

1. NATURAL SCIENCES

1.1 Mathematics and computer sciences [mathematics and other allied fields: computer sciences and other allied subjects (software development only; hardware development should be classified in the engineering fields)]

1.2 Physical sciences (astronomy and space sciences, physics and other allied subjects)

1.3 Chemical sciences (chemistry, other allied subjects)

1.4 Earth and related environmental sciences (geology, geophysics, mineralogy, physical geography and other geosciences, meteorology and other atmospheric sciences including climatic research, oceanography, vulcanology, palaeoecology, other allied sciences)

1.5 Biological sciences (biology, botany, bacteriology, microbiology, zoology, entomology, genetics, biochemistry, biophysics, other allied sciences, excluding clinical and veterinary sciences)

2 ENGINEERING AND TECHNOLOGY

2.1 Civil engineering (architecture engineering, building science and engineering, construction engineering, municipal and structural engineering and other allied subjects)

2.2 Electrical engineering, electronics [electrical engineering, electronics, communication engineering and systems, computer engineering (hardware only) and other allied subjects]

2.3. Other engineering sciences (such as chemical, aeronautical and space, mechanical, metallurgical and materials engineering, and their specialised subdivisions; forest products; applied sciences such as

geodesy, industrial chemistry, etc.; the science and technology of food production; specialised technologies of interdisciplinary fields, e.g. systems analysis, metallurgy, mining, textile technology and other applied subjects)

3. MEDICAL SCIENCES

3.1 Basic medicine (anatomy, cytology, physiology, genetics, pharmacy, pharmacology, toxicology, immunology and immunohaematology, clinical chemistry, clinical microbiology, pathology)

3.2 Clinical medicine (anaesthesiology, paediatrics, obstetrics and gynaecology, internal medicine, surgery, dentistry, neurology, psychiatry, radiology, therapeutics, otorhinolaryngology, ophthalmology)

3.3 Health sciences (public health services, social medicine, hygiene, nursing, epidemiology)

4. AGRICULTURAL SCIENCES

4.1 Agriculture, forestry, fisheries and allied sciences (agronomy, animal husbandry, fisheries, forestry, horticulture, other allied subjects)

4.2 Veterinary medicine

5. SOCIAL SCIENCES

5.1 Psychology

5.2 Economics

5.3 Educational sciences (education and training and other allied subjects)

5.4 Other social sciences [anthropology (social and cultural) and ethnology, demography, geography (human, economic and social), town and country planning, management, law, linguistics, political sciences, sociology, organisation and methods, miscellaneous social sciences and interdisciplinary , methodological and historical S1T activities relating to subjects in this group. Physical anthropology, physical geography and psychophysiology should normally be classified with the natural sciences].

6. HUMANITIES

6.1 History (history, prehistory and history, together with auxiliary historical disciplines such as archaeology, numismatics, palaeography, genealogy, etc.)

6.2 Languages and literature (ancient and modern)

6.3 Other humanities [philosophy (including the history of science and technology) arts, history of art, art criticism, painting, sculpture, musicology, dramatic art excluding artistic "research" of any kind, religion, theology, other fields and subjects pertaining to the humanities, methodological, historical and other S1T activities relating to the subjects in this group]