

Contenuto archiviato il 2024-06-18



# Novel Business model generator for Energy Efficiency in construction and retrofitting

# Rendicontazione

Informazioni relative al progetto

NEWBEE

ID dell'accordo di sovvenzione: 314326

Sito web del progetto 🗹

Progetto chiuso

Data di avvio 1 Ottobre 2012 Data di completamento 30 Settembre 2015 **Finanziato da** Specific Programme "Cooperation": Nanosciences, Nanotechnologies, Materials and new Production Technologies

**Costo totale** € 4 564 610,69

**Contributo UE** € 3 350 000,00

Coordinato da FUNDACION TECNALIA RESEARCH & INNOVATION

# Questo progetto è apparso in...



# Final Report Summary - NEWBEE (Novel Business model generator for Energy Efficiency in construction and retrofitting)

#### 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).

Project 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.

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 Funct6

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

#### Project Results:

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:

#### 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:

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

o 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.

o 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:

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

#### 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).
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.

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 ).

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);

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

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).

• 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. Pre-assessment tool was demonstrated in one scenario:

• S5: Refurbishment in "HakaPaavo".

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 multiapartment old building the potential of energy efficiency retrofitting;

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

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

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, bestpractices, 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;

• 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. • 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

· 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."

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

- 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.

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 . 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

STEP 1: What should we disseminate?

Result: A list of the main outcomes of the project.

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

o Directorate-General for Enterprise and Industry

- o The Directorate-General for Climate Action
- · Key message to policy makers and public authorities
- Key message to investors and building owners
- o Investors
- o Building owners
- o Professional building owners
- Key message to architects
- Key message to consultants
- o ESCOs
- o Energy Designers
- o Engineers active in the energy efficient retrofitting
- Key message to SMEs
- o Construction companies
- Key message to investors
- Key message to providers
- o Manufacturers of EE technologies
- Key message to associations
- o Professional associations/networks active in the energy efficient retrofitting
- · Key message to building and facility managers
- o Facility managers
- o Key message to tenants and users
- · Key message to research and development organizations
- o Related EU project leaders
- o 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 Energyperformance 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 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 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: How 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.

List of Websites: http://www.newbee.eu/

# Documenti correlati

➡ final1-final\_report\_en\_v3.pdf

# Ultimo aggiornamento: 4 Aprile 2016

Permalink: https://cordis.europa.eu/project/id/314326/reporting/it

European Union, 2025