



EnEf - Energy Efficiency in the Building Sector: A Sustainable Future

Progress Report

Public Part



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Project information

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Executive Summary

The EnEf project aims at designing training modules and contents enriched by an e-learning platform, visual elements simulations and interesting practices in building industry to be delivered to entrepreneurs and managers of the building industry.

These trainings will focus on energy efficiency in buildings. The main aim of the project is to alleviate the lack of knowledge of entrepreneurs and managers of the building industry by using new methodologies and by building up modules of training in European standards trying to grasp the common points between different applications in different countries.

In the first phase the project analysed the gaps of the current training systems concerning energy efficiency in building as well as the lessons to be learned from the more developed systems in partner countries. This analysis has been reported and published and the training contents will be prepared on the basis of this report. The training contents will be formed of different modules in order to provide entrepreneurs and managers of the building sector with different backgrounds to have access to the modules they need most.

The construction sector is one of the largest in Europe and a major engine for development. This project will contribute to cost effective energy efficiency, reduction of greenhouse gas emissions and cost savings to Member States.

The network of partners has been formed in order to accomplish the project tasks in the most appropriate way, including experts on environmental issues and entities with experience in European training projects: the consortium, in particular, is made of consulting companies, training organisations, regional development agencies, a national chamber of constructors, a University and a research center specialised in virtual representations. Internal partnership's material has been spread in English then each partner translated the training material into its own language. The geographical composition has also been taken into appropriate account: the project in fact gathers together different partners from different European regions, not only to analyse various entrepreneurial situations, but especially to promote, from the beginning the widest diffusion of results possible. The countries involved are: Italy, Ireland, Slovakia, Germany, Greece, Spain and Bulgaria.

The major result achieved to date is the analysis of the training needs of the construction sector in the seven regions involved. A transnational survey revealed the specific contents and methods to be delivered, customised on the target needs.

The main outcome will be a flexible and innovative training plan, exploitable overall in Europe.

The project website address is www.enef-project.eu



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1. Project Objectives

The EnEf project aims at improving energy efficiency in buildings alleviating the lack of knowledge of entrepreneurs and managers of the building industry. Specific objective is to set up new methodologies and build up training modules concerning energy efficiency in buildings, in accordance with European standards. This will be achieved by creating in partner countries, generally in Europe, an accessible training approach enriched by an e-Learning platform, visual elements simulations and interesting practices in building industry.

The project final aim is to change the habits in the use of energy efficient tools and methods also through a new vision of the topic. There is, currently, in the building industry a too much fragmented vision of the various components of the system (edifices' features, machinery, photovoltaic panels, systems control, lighting, etc) while EnEf wants to integrate them into a single framework that considers the entire process of building up and renovate an edifice. Fragmentation of standards, languages and specializations, leaves on the ground most of the potential for energy efficiency and renewable sources that could be exploited. The overall approach must be redefined and must pass the idea of an efficiency linked to the replacement of the component towards the idea of developing a total energy efficient architecture.

The target is the construction industry and in particular managers and entrepreneurs interested in improving their knowledge on the topic. They are directly involved in project activities: on one hand they took part in the initial analysis of training needs; on the other, they will test the developed modules and give their feedbacks for the training plan final improvement.

The target group will have the possibility to use the innovative training plan to adapt their activities to new standards of construction and refurbishment with an eye to energy efficiency. Besides technical information and training on the different tools and methods applicable for energy efficiency, the target group will be trained also about the relevant legislation and the strategies to market such products. Among the most important needs emerged during the needs analysis, there is the capacity to sell energy efficient products and to convince the customers that they are the best choice for their houses, dwellings, offices and so on.

The project also addresses the specific objectives and priorities of the Lifelong Learning Programme:

- To help promote creativity, competitiveness, employability and the growth of an entrepreneurial spirit;
- To support the development of innovative ICT-based content, services, pedagogies and practice for lifelong learning;
- To support participants in training and further training activities in the acquisition and use of knowledge, skills and qualifications to facilitate personal development, employability and participation in the European labour market;



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- To improve the quality and to increase the volume of co-operation between institutions or organisations providing learning opportunities, enterprises, social partners and other relevant bodies throughout Europe;
- To developing Vocational Skills considering the labour market needs, in line with the European Commission Communication “New Skills for New Jobs”.

2. Project Approach

One of the first steps carried out by project consortium has been the development of the **methodology of analysis**, a framework of theoretical and practical hints on how to conduct the local analysis of the target group training needs concerning energy efficiency.

The goal of the methodological framework has been to create an infrastructure where the project team could:

- Understand the use of energy efficiency technologies in European small to medium enterprises (SMEs) in the construction industry.
- Identify barriers and challenges
- Analyse gaps in current training systems targeted at SMEs
- Understand and absorb lessons from state of the art systems

The methodological framework also included the analysis tools (questionnaires) and the template for regional reports.

On the basis of the developed methodology, **each partner launched a survey** in its region, then analysed the results and produced a regional report, which also made an economic picture of the regions concerned, of the building sector characteristics and challenges and presented the preliminary findings emerged from the answers provided by interviewed.

Different methods were used to reach the companies, trying to involve a great number of representatives of the building sector in the seven European countries of the partners. In particular, managers and employees were contacted by email, telephone and in some cases they were visited in person.

The total number of questionnaires surveyed by the seven partner's regions is 185.

Last stage of the needs analysis has been the production of a Report on analysis of results, aiming to gather the results of the transnational survey, summarise the contents of Regional reports produced by each project partner and provide recommendations for the training modules development.

Findings of questionnaire survey helped to indentify the approaches of research aims fulfilment. Generally, the research aims were defined, as:

- To ascertain whether responding companies are familiar with new energy efficient technologies;
- To determine whether the responding companies make use of emergent energy efficient technologies in their construction projects;
- To identify reasons why the responding companies do/do not make use of energy efficient products;
- To ascertain whether the responding companies are proactively preparing for the use of energy efficient products in their business;
- To compare SMEs from different EU nations on their use of energy efficiency products;
- To determine whether the individual respondent is interested in energy efficient products or services;
- To identify companies with an interest in training or participation in the project;



- To determine how any potential training should be delivered.

The final Data collection methods were quantitative and qualitative in nature and they included activities such as regional reports of each partner's region, interviews and questionnaires. A combination of these data collection methods were used to elicit information for the final analysis. By adopting this approach, the strengths of one data collection method compensate for the weaknesses of the other. In addition, the subjects were examined from different angles and a more complete picture of the situation was provided.

The **dissemination strategy** is devised in order to:

- Raise awareness of the project and the issues relevant to EnEf activities in appropriate industrial and research circles.
- Foster acquaintance among European building SMEs of the emerging EnEf solutions so to favour access of the target public to project results and prepare the way for further exploitation
- Cluster with other similar projects in order to learn from them and to make EnEf know to them in turn.

The activities scheduled and described in the Dissemination Plan include:

- Internet presence: project website, partners' and other relevant websites
- Elaboration of paper-based and web-based information and promotion materials: press articles, leaflets, newsletters, technical manuals
- Organisation of public events in each country involved (at least two per partner) and a closing conference in Bulgaria
- Presence in fairs, contribution to seminars and conferences relevant to the use of web project
- Networking and cooperation with organisations, associations and training networks of the building sector

Two dissemination levels are envisaged:

1. The overall strategy of the consortium, which includes actions and tools described in the present documents. At this level the consortium acts as a whole.
2. The national/regional/local level affected by the individual strategies developed by each partner, according to its specific type of organisation, businesses, activities, resources, etc.

The **exploitation of results** will take place in order to transfer what has been learnt into new practices. This task will involve above all an identification of target groups which are likely to find the products/outcomes of the project interesting and relevant to their needs, starting from the stakeholders who have been involved during the development of the project.

Exploitation activities will ultimately aim at the Commercialisation of the project outcome, that is the VET system for building SMEs' entrepreneurs.

Aim of the project is to create a product that will be requested by the above mentioned target group, to increase their level of competence on environmental issues in building industry.

In addition, the partners will use the developed product to update their activities so as to deliver the brand new training system through their formative activities and/or



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consultancy. The agreed ways to exploit the results has the aim to make living the projects and outputs beyond the contractualized life of the activities.

In the final stages of the project, the consortium will agree on which actions to begin among public events (presentations, conferences, workshops...); creating audio-visual products (CD-Rom, DVD); setting up long-term collaboration with building association; developing information material (newsletters, brochures, booklets, best practice manuals...); creating an Internet portal, and more.

3. Project Outcomes & Results

The results of the first year project lifetime are mainly related to the investigation of the state of the art in the seven countries involved and the definition of the training modules and specific contents to be delivered to the target group in a comprehensive training plan on energy efficiency in buildings.

In particular, the transnational survey conducted in Italy, Ireland, Slovakia, Germany, Greece, Spain and Bulgaria had the following results, sorted on the basis of the single survey objectives:

1. To ascertain whether responding companies are familiar with new energy efficient technologies – conclusions.

- Most of the companies are familiar with new energy efficient technologies;
- The companies showed a less preparation within the implementation of strategies in place to use more energy efficient products.

2. To determine whether the responding companies make use of emergent energy efficient technologies in their construction projects – conclusions.

- All companies use some type of energy efficient technologies in their construction projects;
- Companies are using mostly insulation (cavity or solid wall; floor; tanks; pipes; attic) and energy efficient glazing;
- Also the most commonly used technologies are building materials and energy saving light bulbs.

3. To identify reasons why the responding companies do/do not make use of energy efficient products – conclusions.

- The geothermal / biomass systems are much lower used by the responding companies as other energy efficient technologies;
- The reason of above mentioned might be a subject of less possible opportunities to use them, because of their environmental potential and capacity, and also various policies of use within the partner's regions.

4. To ascertain whether the responding companies are proactively preparing for the use of energy efficient products in their business – conclusions.

- Most of the responding companies are proactively preparing to extend their use of energy efficient products in their business; this is confirmed by the company's interests to be prepare for stronger energy efficiency standards.

5. To compare SMEs from different EU nations on their use of energy efficiency products – conclusions.

- The variety on use of energy efficiency products by different EU regions is partly caused by the geographical location, climate conditions and also financial issues of population in these regions.

6. To determine whether the individual respondent is interested in energy efficient products or services – conclusions.

- The responding companies are interested in energy efficient products or services.

7. To identify companies with an interest in training or participation in the project – conclusions.

- Almost all responding companies are interested in training or participation in



the project.

8. To determine how any potential training should be delivered – conclusions.

- Concerning the delivery method of a training course, the companies stated as most important the easy accessibility to learning material and access and exposure to industrial cases.
- Besides those preferences are also equally preferred contact details of experts, problem based learning and exercises, and best practice tools and checklists, by the majority of SMEs surveyed.

The survey results led to the following recommendation for the development of the training plan:

- Pre-selection of the contacted companies should be done on the basis of location and also number of employees; also the type of company developments is significant and should be carefully considered;
- The companies should be contacted again and asked to confirm their serious interest actively participate on the training course – this will prevent to integrate such companies which wouldn't have a sufficient time to deal with all training issues and tasks;
- According to the results of survey, the self managed online training course (module) would be the best method of education;
- This could be supported by the interconnection with the experts in the field, which will help companies to negotiate and discuss their needs on-time;
- All participants of the training module should have own access to intranet environment in order to secure precise monitoring of their educational activities;
- The ideal tool for e-learning is the intranet environment;
- The intranet environment should be programmed in very simple manner, easy understandable and also easy to operate;
- Functionally, the intranet should have some evaluation tools, which could analyze the effectiveness of participant's training;
- The participants should be examined from time to time or after completing of certain block of given training in order to compel them to stay focused on training course;
- As far as the topics covered by the training course, and also supported by the results of questionnaire survey, the training should cover:
 1. Relevant legislation that impact the construction business (carefully selected EU level standards and regulations);
 2. New trends in energy saving products and services;
 3. Marketing energy saving products to customers.
- In order to strengthen the effectiveness of future results, the experts (architectures, engineers, project managers and other professionals) should be the part of training module preparation.
- The impacts of training module should be monitored by the responsible authority of EnEf project on yearly basis and companies should declare to provide responsible authorities with the relevant data for future analyses.

Following the recommendations provided in the report of analysis and on the basis of the results obtained with the survey, the **definition of the training plan** has been



carried out in a report prepared by the Bulgarian Construction Chamber, in collaboration with the Spanish partners Direccion de Arquitectura - Junta de Extremadura. The Training Plan, in particular, will contain the following modules:

- 1. Concept for energy efficiency:** process definition, characteristics, key actors:
- 2. Marketing**
 - 2.1. Monitoring of Public Procurement;
 - 2.2. Offering services to owners – Advertising; Persuading owners of realization of work. Good practice to promote energy efficiency and the company. Products: Lesson and Good practices
- 3. Offer and Bill of quantities**
 - Work with or without drawings, complete incomplete input data - is available in public procurement;
 - Collect data - size, power consumption, other means.
 - Calculations
- 4. Contracting:** Contracts and work with the investor - legal side of things.
- 5. Execution of refurbishment**

Divided in several Modules concerning the different refurbishment works:

 - 5.1. Facade Systems**
 - 5.2. Glazing** - replacement; Technical Module
 - 5.3. Installations:**
 - Water and sewage
 - Electrical installation
 - Lighting
 - Heating
 - Ventilation and air conditioning
 - 5.4. Roof** - Flat roof waterproofing and heat insulation;
 - 5.5. Foundations** - waterproofing;
 - 5.6. Renewable energy sources** - classification of all RES. Application in civil engineering: heat pumps, photovoltaic and solar thermal systems.
- 6. Acceptance** of the completed works - how it works.
- 7. Legal Aspects** - Lesson and tasks. Links towards the corresponding acts and standards in English and all partner languages.
- 8. Energy efficient materials** – visualization/jpg pictures with good resolution

The training plan is currently being developed by the consortium following the structure proposed in the report: the leader of this task is the Bulgarian Construction Chamber, supported by the Direccion de Arquitectura - Junta Extremadura.

It will be enriched by **visual elements and 3D simulation tools**, to be created by Vicomtech. The simulation tools will allow users to observe different practices applicable in the building industry with different energy consumption models. A draft structure of the simulation building is visible in the following pictures:



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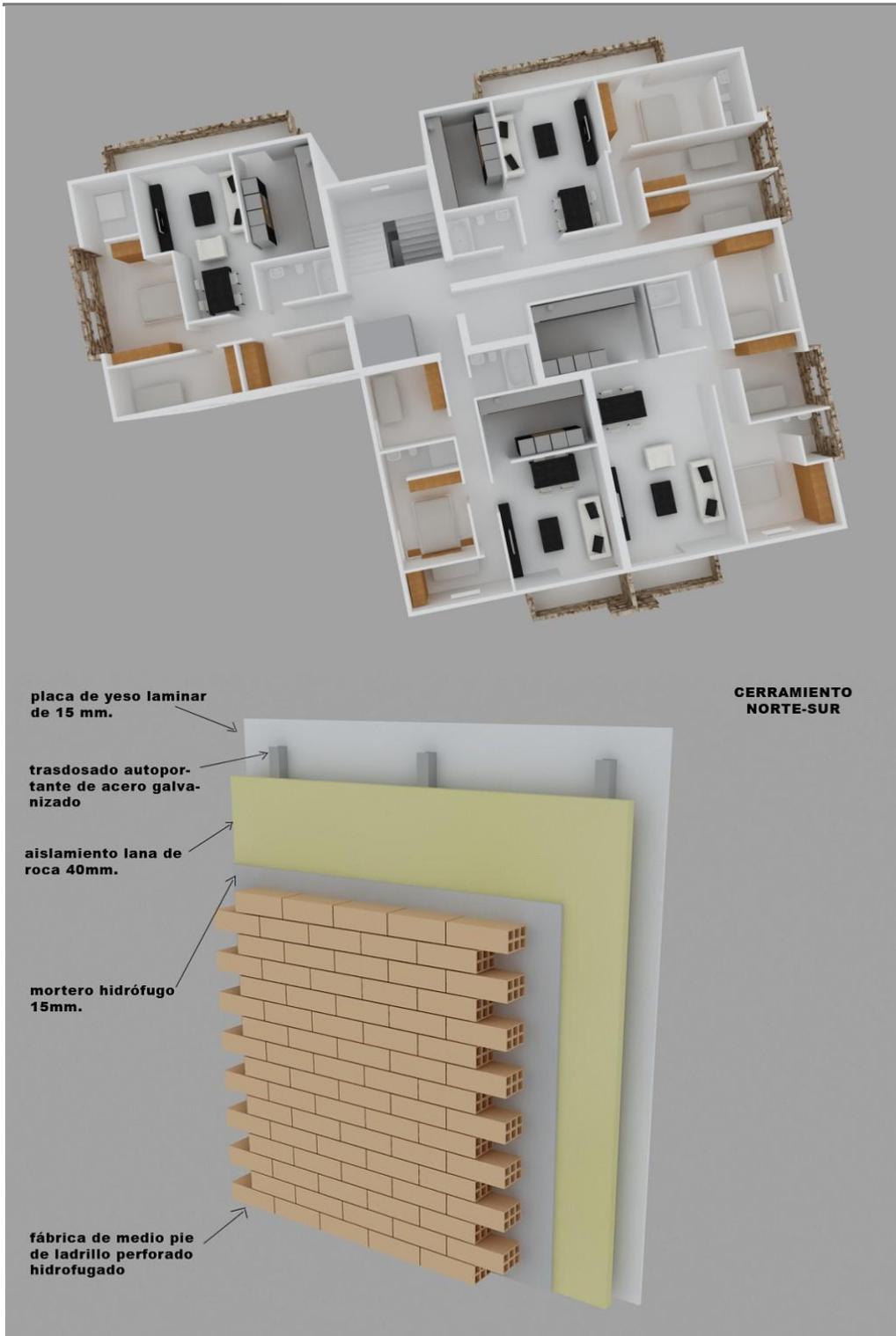
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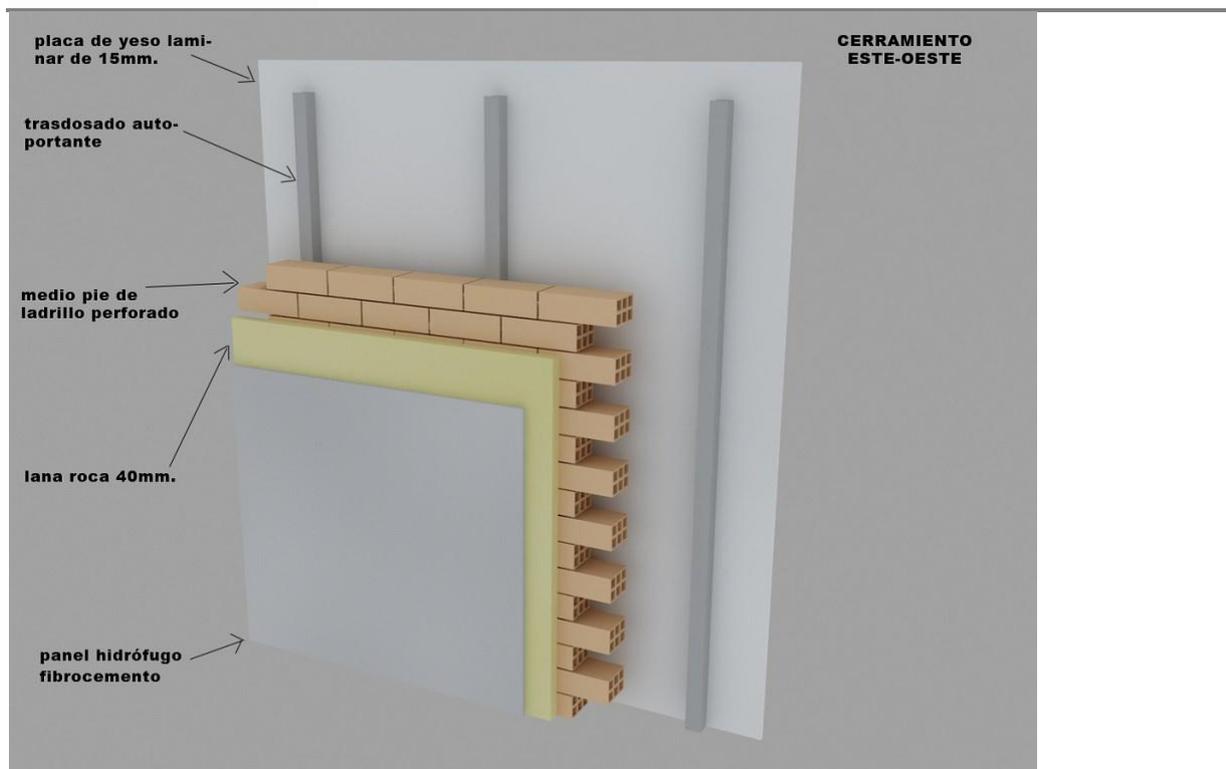
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Besides technical results, the partners also worked on the quality assurance, with the supervision of the Greek partner IDEC, which provided an interim evaluation report. The products produced up to date are mainly available on the project website www.enef-project.eu, except for confidential documents. The general assessment on the quality of the project management is positive, there are not negative remarks about the project plan and its coordination. In particular:

- The transnational cooperation is assessed positively by all partners
- All the partners are satisfied with the quality of deliverables
- General impressions of the partners can be summarised in few sentences: the partners experienced some difficulties in the phase of contacts with SMEs, and some intermediate deadlines were difficult to respect, but in general the consortium managed to fulfil all tasks according to the most important deadlines. The progresses of the project until now give an optimistic view of the future steps.
- Conclusions:
 - The project has started with a notably intensive work programme. However the consortium escaped the risk of inter-partnership frictions.
 - All partners gave a positive rating as regards the efficiency of collaboration among the partnership, the respect of the work packages and work plan, the quality of deliverables.
 - Being the production of new materials and pilot testing scheduled for next months, the partners had to deal more with abstract notions.
- Recommendations:
 - Communication should retain the same level of good understanding
 - monitoring has to be tighter in the remaining period



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- All partners have to speed up the process with the development and translation of the training materials

At this stage of the project there are not yet final results, but rather intermediate results necessary for the development of the final project products and to reach the final goal: the delivery of an innovative training plan on energy efficiency for the European building industry.

- the Report on analysis of Results
- the Report on Training Plan
- the Interim Evaluation Report on Quality Assurance
- The Press kit, containing the brochures, two slideshow to present the project (a short and a long version), EnEf logo and an offline version of the project webpage
- the newsletters to communicate the ongoing progresses

4. Partnerships

The project is implemented by various European entities with a long experience in European projects offering a multidisciplinary and multicultural character that provides significant added value to the project.

Those partners have different profiles, including experts on environmental issues and others with experience in European training projects.

The geographical composition has also been taken into appropriate account: the project in fact gathers together different partners from different European regions, not only to analyse various entrepreneurial situations, but especially to promote, from the beginning the widest diffusion of results possible.

The partners involved are:

- Eurocrea Merchant srl, Applicant Coordinator. It is a consulting company operating for over 20 years in Italy, with a loyal base of customer and a rooted presence both in Milan and Naples. Eurocrea has a long experience in the sectors of project management and coordination, consulting, advising and European Projects.
- Innovate an Irish Business and Information Technology department of Niugalway University with a long experience in developing training programmes and contents;
- Direccìon de Arquitectura, part of the Regional Ministry of Infrastructures within the Regional Government of Extremadura (Spain). This Regional Ministry has the competences in the area of transport, infrastructure, housing, urban planning and management in the Territory;
- SRDA, a Slovak regional development agency, focused on boosting the economic development in the region by networking public and private sectors together with NGO, through coordinative support to the development and investment activities;
- ILI - Institut für Lern-Innovation a German Nurnberg University department involved in applied research, development, consultancy, and evaluation in the field of new technologies in education, training and e-learning;
- IDEC, a Greek consultancy company specialist in management training. Clients of IDEC are both SMEs and the larger Greek companies, Entrepreneurs' Associations, Universities and Chambers of Commerce/Industry, non for profit Organisations;
- VICOMTECH, an applied research centre for Interactive Computer Graphics and Multimedia;
- BULGARIAN CONSTRUCTION CHAMBER, the biggest employers' organization of 1800 companies, mainly SMEs, covering all areas of the Bulgarian Construction sector. The member companies employ personnel



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close to 100.000, and represent about 65 % of the total national construction output;

The project relies on the combination of different expertises and synergies, and the quality of the results is directly proportional to the level of interaction among those different competences.

All these entities already worked and still do it, on various projects and programmes also national and/or regional coming from different countries.

The added value of working in a multiactor and transnational consortium is the possibility to exchange visions and experiences in all the phases of the project.

In particular, the survey launched in the 7 countries revealed that there are important differences in the awareness and practice of energy efficiency in buildings, depending on the country. But also, the results revealed that there is a common need to improve knowledge and tools available. The possibility to take into account the relative and specific lacks of knowledge emerged in the different countries, surely will bring an added value to the final training plan.

Furthermore, for the concrete people involved in the projec, i.e. the partners' staff, the opportunity to confront and exchange their points of view in project meetings or also in the frequent communication, assured an high level of collaboration.

5. Plans for the Future

The consortium is currently engaged in the "core" of project activities, i.e. development of the training plan and the e-learning platform, which will be both available by the end of February 2012.

The partners directly responsible for the development of the modules are Bulgarian Construction Chamber and Direccion de Arquitectura, which have a training department inside their companies and a long experience in drafting training contents for the building sector.

Anyways, all the partner are involved in this phase of the project, and in particular:

- Vicomtech is working on the elaboration of the 3D simulation tools
- Eurocrea Merchant, INNOVATE, IDEC and ILI are responsible for the selection of supporting materials to be included in the training plan.
- ILI, moreover, is responsible for the technical tasks related to the website management/updatings and the creation of the EnEf platform for distance learning.

For what concerns the timing, the next steps are as follows:

- Delivery of Training modules and e-learning platform - by the end of January 2012
- First evaluation internal of the training tools and materials: the partners will meet at the beginning of February 2012 and will discuss about the deveoped training modules and the distant learning platform. They will then perform a one week of internal test and give their feedabcks. On the basis of this first evaluation the materials ad platformwill be improved. -by the end of February 2012.
- Launch of the pilot test: each partner will invite representatives of the building sector to test the training and give their feedbacks. - By the end of June 2012
- Final evaluation of the training and final adaptation to the pilot test results - by the end of September 2012
- Dissemination of project results: the activities related to dissemination will be implemented during the overall duration of the porject, but the most important events will be launched once the main outcomes will be available, i.e. after January 2012. Each partner will organise at least two public events (some of them already had one), publish at least 3 articles on the press.
- Exploitation: exploitation activities will take place in order to transfer what has been learnt into new practices . This task will involve above all an identification of target groups which are likely to find the products/outcomes of the project interesting and relevant to their needs, starting from the stakeholders who have been involved during the development of the project.

Exploitation activities will ultimately aim at the Commercialisation of the project outcome, that is the VET system for building SMEs' entrepreneurs. The Plan for exploitation will be developed once the main outcomes will be available: the consortium will discuss and agree on the exploitation practical activities during the second coordination meeting planned for February 2012.



6. Contribution to EU policies

Sustainable environment is the major problem globally, nowadays. Energy savings and energy efficient buildings are considered a key way for reduction of green house gas emissions, taking into consideration that in fact buildings are responsible for over 40% of Europe's greenhouse gas emissions. The EU Directive 2010/31/EC defines concrete goals for energy savings and for the use of renewable energies in buildings. On the other hand, the construction sector in Europe is a very big sector, with a huge impact on development. It consists of about 34 sub-sectors and, according to EUROSTAT, it employs 14.8 million persons (11.5% of the non-financial business economy workforce), while generating an estimated EUR 562 billion of value added (9.3% of the non financial business economy's total value added). Most construction enterprises serve a local market and consequently the sector is characterised by a high number of small companies (employing less than 50 persons), which according to EUROSTAT employ 72.1% of the sector workforce, many of them migrants, and provide 64.7% of the sectoral value added (compared with an average 50.2% and 39.2% respectively for the whole non-financial business economy).

The project is also in line with the Europe's 2020 strategy for growth, which, among others, has set a specific priority to be reached by 2020: 20% gas emission reduction, 20% of energy from renewable, 20% increase in energy efficiency. Finally, the project contributes to the Lisbon Strategy, which aims to make Europe "the most competitive and dynamic knowledge-based economy in the world, capable of sustainable economic growth with more and better jobs and greater social cohesion". The project aims to address this priority by improving the sustainability of the European economy and contribute to the growth of a sector, that of renewable energies, which is expected to expand in the future.



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7. Extra Heading/Section

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