ree_trofit

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REE_TROFIT

TRAINING ON RENEWABLE ENERGY SOLUTIONS AND ENERGY EFFICIENCY IN RETROFITTING

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1. EXECUTIVE SUMMARY

REE_TROFIT aims to contribute to solving the shortage of local qualified and accredited retrofitting experts, as foreseen in the European Energy Performance of Buildings Directive (EPBD) and its recast - and as indicated by various European countries in an assessment by the EC - for increasing the energy performance of the existing building stock.

SPECIFIC OBJECTIVES	RESULTS ACHIEVED
Definition of a model for a European vocational training and a comprehensive educational tool (training methodology and material).	The REE_TROFIT training methodology and the training material are developed and definitely improved.
Promotion to regional, national and European policy makers, Training institutes, Chambers of Commerce.	Best practices for the implementation and for the institutionalization of vocational training courses were developed as well as suggestions to regional, national and European policy makers on how to incentivize, de-bottleneck and impact the local retrofitting markets for full implementation of the EPBD.
Delivery of localised vocational courses in each of the 6 participating countries through 3 rolling cycles (i.e. at least 1 course/year/country).	18 vocational training courses delivered within the 6 partnering countries. 3 training courses were delivered in each of the 6 participating countries through 3 rolling cycles (1 course/year/country). 1483 professionals trained among which 453 electrical installers, 512 thermo-hydraulic installers, 518 construction professionals.
Positive training course evaluation: more than 80% of the trainees feel they have improved their skills in retrofitting solutions.	1293 trainees out of 1483 participants (87%) obtained a Certificate of attendance. The overall evaluation of the trainees about the training courses resulted on average 4,4 on 5. The evaluation of the trainees regarding the capability to apply the knowledge and skills acquired during the courses resulted on average 4,1 on 5.
Start up of the institutionalization process of vocational training courses with Training Institutes, Chambers of Commerce in partnering countries adopting the REE_TROFIT model. Evaluation of project results by Regional Policy Makers in order to promote measures to facilitate the implementation of training and institutionalisation of courses.	Partners identified several pathways and conditions to facilitate institutionalization of the training model in each of the partnering countries. The networks of the Chambers of Commerce were considered to be the most reliable way to address institutionalization of the model.
Widely disseminate project activities and results.	Project results have been widely disseminated through website, leaflets, newsletters, workshops and presentations at conferences and meetings, and public events. Vocational Training Institutes, national and regional policy makers and Chambers of Commerce as well as Housing and consumer associations have been targeted. Moreover promotion of training towards SME's building professionals was addressed in each participating country. Stakeholders of non-partnering countries (Austria, Poland, Belgium) were also contacted for dissemination purposes.

REE_TROFIT has used in-house know-how and the experience of participants in carrying out vocational courses on innovative eco-building technologies to define the best practices for the institutionalization and implementation of vocational courses on renewable energy solutions and energy efficiency in retrofitting. Such knowledge has been instrumental in the set up and implementation of a large-scale educational scheme in 6 member states for training more than 1400 building professionals during the course of the project (3 years) and by fostering the exchange of knowledge and the best practices among stakeholders. REE_TROFIT has provided suggestions to regional, national and European policy makers on how to incentivize, de-bottleneck the local retrofitting markets for full implementation of the EPBD and define an exploitation strategy for assuring the sustainability of training beyond the project's duration.

The REE_TROFIT project has contributed to the overcome of some of the barriers to training in the building sector to curb current trends of energy efficiency; developing a training model whose features are basically the following:

FLEXIBLE

Applicable in contexts with different regulatory frameworks, climate, landscape restrictions, qualification levels of learners, etc.

TRANSFERABLE

Capable of responding to local training needs through methodologies and tools transferable at the European level.

INNOVATIVE

Accessible, affordable and capable of overcoming the problems encountered by previous training programs experimented in the partnering countries.

MODULAR

The different training programs are composed of **independent**, closed, d**omain-specific** modules that may be activated according to the different training needs.

SHORT

Short duration of the training courses, which are composed of brief training tracks in order to ease the attendance of the targeted professionals, capable of breaking down barriers such as lack of time, reluctance to invest in training, poor listening habit, etc.

PLURAL

Different training methods, tools and media might be used in the training process in order to take into consideration the trainee's needs and to guarantee effectiveness.

INTERACTIVE

In order to ensure the active involvement of the trainees.

OPEN

Possible different training environment also supported or co-designed with the market's leading companies.

PRAGMATIC

Committed to providing high quality and accessible training opportunities to each trainee and effective skills and competence readily applicable in their workplace.

EFFECTIVE

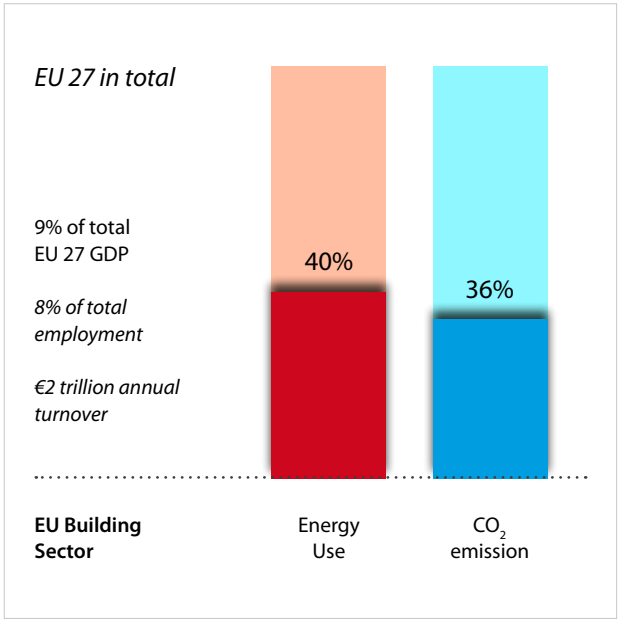
Allowing professionals to grow in their jobs and improve their performance.

2. RETROFITTING: A CHALLENGE FOR TODAY AND AN OPPORTUNITY FOR THE FUTURE

2.1 THE RENOVATION OF THE BUILDING SECTOR IN EUROPE

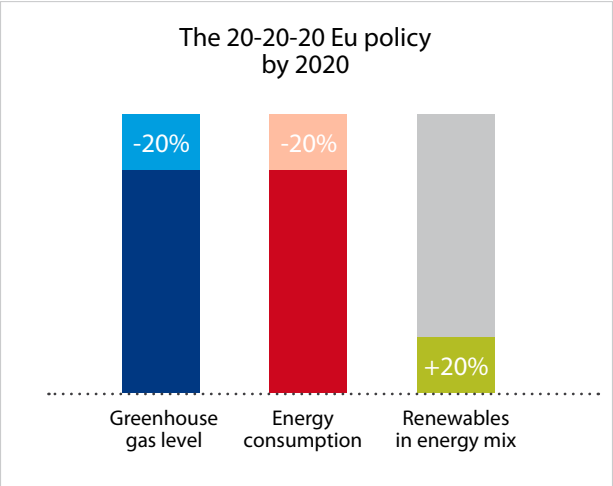
It is estimated that in the 27 European member states, as well as Switzerland and Norway there are 25 billion m^2 of useful floor space. Residential buildings account for about 75% of the total stock. A substantial share of the stock is more than 50 years old, with many buildings in use today that are hundreds of years old. More than 40% of residential buildings have been constructed before the 1960's, when energy building regulations were very limited (*source: BPIE Survey*).

Buildings are considered to be responsible for more that 40% of total energy consumption. Moreover, they are responsible for around 36% of CO_2 emissions in Europe.



For these reasons, attention to sustainability and energy efficiency in the building sector has been continually growing in the last decade.

In this context, actions aimed at retrofitting and energy, re-qualifying the current building stock could bring to relevant reduction energy consumption as well as improving indoor comfort. Hence such actions would contribute to reaching the EU 2020 target regarding climate change and energy performance by 2020: 20% reduction of greenhouse gas emissions, 20% savings of EU energy, 20% renewable energy on the total energy consumption.



Results could be achieved with a sweeping change in the building sector, including cultural changes and development of a more sustainable approach to resources and building materials, in the design, the construction and maintenance of buildings.

It is therefore, necessary to invert the past tendency by increasing the quality of new buildings and retrofitting interventions of the existing stock in order to achieve higher indoor comfort and resource savings in terms of energy consumption and materials.

On 19 May 2010, the EU adopted the Energy Performance of Buildings Directive 2010/31/EU (EPBD) which is the main legislative instrument to reduce the energy consumption of buildings.

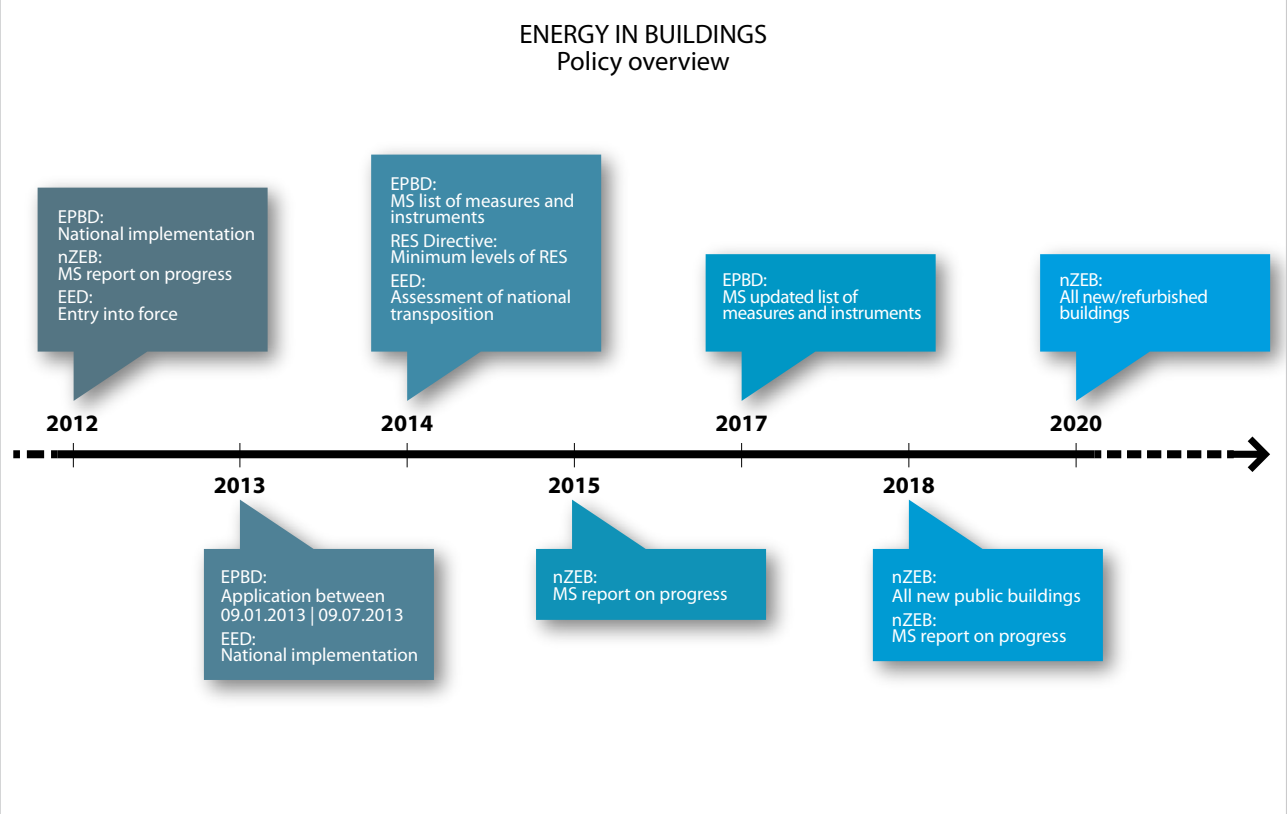
Under this Directive, Member States must establish and apply minimum energy performance requirements for new and existing buildings, according to the local market and climatic context, ensure the certification of build-

ing energy performance and cost effectiveness. Moreover, the Directive requires Member States to ensure that by 2021 all new buildings are so-called "nearly Zero-Energy Buildings"(nZEB), buildings that have a very high energy performance. The nearly zero or very low amount of energy required should be covered to a significant extent by energy from renewable sources, including energy from renewable sources produced on-site or nearby. Moreover, the current building stock is also required to be more efficient in terms of energy consumption, strongly promoting the sustainability and energy efficiency in building renovation.

According to a study of the Buildings Performance Institute Europe (Brussels) energy demand from the building sector will more than double by 2050. It was estimated that the energy savings in buildings would slash the EU's CO_2 emissions by 780 million tons and save €100 billion in fuel costs.

The demand for Low-Energy building is actually growing and a further rising is foreseen in the next years, becoming an opportunity for the building sector to overcome the actual market crisis underway in most of the EU countries.

Unlike the other 2020 targets on greenhouse gas emissions and renewable energy, the EE target is not legally binding. The EU Commission's latest estimations, taking into account the national EE targets for 2020 (set by the member states in the context of the Europe 2020 strategy), suggest that the EU will achieve only half of the 20 % target in 2020.



2.2 MAJOR BARRIERS TO RENOVATION

In order to boost the building sector toward a more sustainable approach, several aspects should be considered and an acknowledged bottleneck lies in the shortage of local qualified and/or accredited retrofitting experts. The main reasons being:

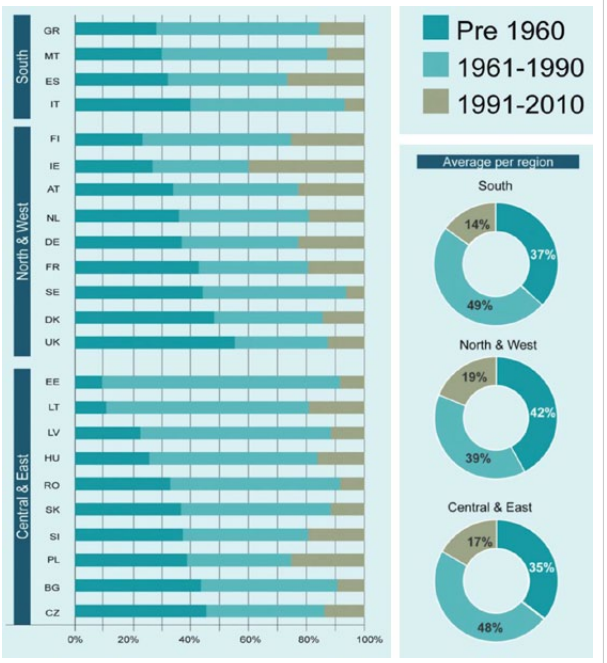
- In many European countries building professionals are still not well aware of the urgency for implementing low-energy retrofitting techniques for energy saving based on EPBD requirements.
- Building professionals are insufficiently trained on the available low-energy techniques and technologies for retrofitting.
- Building professionals are not well enough prepared to convincingly propose and properly apply most up-to-date available techniques and technologies for retrofitting (e.g. choosing and dimensioning the most energy efficient plant/configuration for a specific situation).
- Building professionals show limited motivation for (re)qualification programmes unless proper incentives are put in place (e.g. institutionalization of training).
- The lack of vocational training programmes on low energy retrofitting techniques and technologies.

Moreover, **consumers are not properly informed** about cutting edge technologies and innovative building solutions to improve energy saving, due to the lack of proper communication campaigns about features, effectiveness and reliability of the innovative low energy retrofitting and building solutions. It is therefore a crucial aspect to sustain activities aimed at sensitizing, informing and training people about the potential benefit of low energy building. In particular, a more effective dissemination toward house owners could positively affect the demand for a sustainable building solution.

In addition, dedicated training for building professionals would help to take advantage of specialized professionals and workers (including construction workers properly trained in building shell-efficient building envelopes, thermo-hydraulics and electric installers capable of putting in place systems using renewable energy sources) able to efficiently integrate different innovative systems and to suggest to the market better solutions to improve the energy performance of the existing building stock. A proper implementation is as important as a proper design, since a rough implementation could result in the "boomerang effect" affecting the energy efficiency of sustainable building solutions.

Eventually, policy makers will also have a crucial role in the renovation of the building sector and in de-bottlenecking the national retrofitting markets for full implementation of the EPBD, with local regulations to incentivize both the implementation of energy efficiency in retrofitting and facilitate the qualification of building professionals.

Age profile of residential floor space
IT: Data excludes heritage buildings before 1950.



Source: BPIE Survey

3. THE REE_TROFIT PROJECT

The REE_TROFIT project (Training on Renewable Energy solutions and Energy Efficiency in reTROFITting), co-funded under the EC Intelligent Energy Europe program, provided a practical solution to training needs of building professionals. This was achieved through an innovative training model addressing, with practical integrated approach, the cutting edge technologies and sustainable solutions aimed at retrofitting the existing building stock with energy efficiency techniques and using renewable energy sources.

3.1 THE MAIN OBJECTIVES

The specific objectives of the REE_TROFIT project are listed below:

- To develop a European vocational training model geared to building professionals with the aim of providing them with the knowledge and skills required to tackle the retrofitting and building market using an energy efficiency approach.
- To institutionalize the training model, ensuring a sustainability of the training with its integration in the broader training system achieving the endorsement of different relevant institutions (government organisms, professional organizations, etc.) for assuring the expected massive replication of training and a drastic acceleration of energy savings in existing buildings (through qualification of professionals in the retrofitting market).
- To develop a validation strategy for assessing and further fostering the impact of the project.
- To actively involve relevant stakeholders playing a strategic role in renovation in the building sector (local, regional, EU Policy Makers, Chambers of Commerce, Training Institutes, House owners), in particular through dedicated training of building professionals, including the development and dissemination of the best practices for the implementation and the institutionalization of training with recommendations to Policy Makers, Chambers of Commerce and Training Institutes.
- To deliver 3 rolling cycles of vocational training courses in the 6 participating countries aimed on one hand to test and improve the training model, following the "plan-do-check-act" approach and, on the other hand, to train a relevant number of building professionals.
- To allow high visibility of qualified professionals, through appropriate on-line tools and the eco-building repository available to help training courses to become more effective and productive for trainees.
- To ease knowledge and experience exchange among different countries about the best training practices and on innovative low energy retrofitting solutions for the existing building stock and new buildings.
- On the whole, to boost the building sector toward a more sustainable approach to building retrofitting, supporting the spread of a low energy solution and contributing to the reduction of energy consumption and CO_2 emissions.

3.2 THE REE_TROFIT NETWORK

The REE_TROFIT partners - Chambers of Commerce, Training Institutes, Universities, Research Institutes - used in-house know-how on innovative eco-building technologies and long-time experience in carrying out vocational courses in order to set up and implement a large-scale educational model on low energy retrofitting.

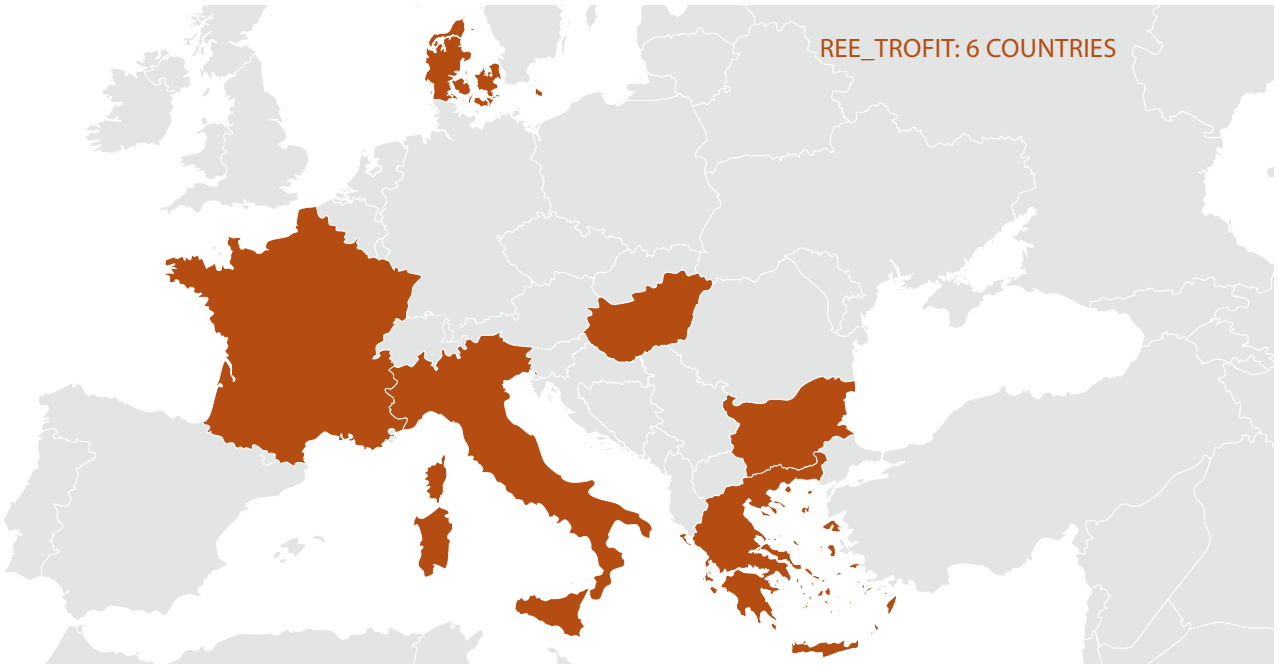
- LUCENSE (IT)
- Chamber of Commerce and Industry of Lucca (IT)
- Technological Educational Institute of Crete (GR)
- Chamber of Commerce and Industry Bács-Kiskun County (HU)
- Chamber of Commerce and Industry of the Drome (FR)
- ABITA Interuniversity Research Centre (IT)
- Engineering College of Aarhus (IHA)
- Bulgarian Chamber of Commerce and Industry (BG)
- European Labour Institute (BG)

After a systematic exchange of experience among the partners and on the basis of the results acquired with preliminary surveys they were equipped to evaluate the knowledge, skills and competence that the targeted trainee should acquire to successfully implement low energy retrofitting.

The REE_TROFIT programs address 3 different vocational training courses for Construction Professionals, Electrical Installers and Thermo-Hydraulic Installers, which have been chosen for their direct correspondence with the market of retrofitting and the skills required (namely the blue collars of the building sector).

All together, the 3 courses represent a common 'platform' to be used for the development of localized training in the different countries, adapting it with reference to the peculiarities of the country - local climate, regulations, language, market conditions (e.g. costs of equipment and products), available fiscal incentives, modules to be taught to trainees, type of qualification gained by trainees in their regional context after attending the course. In order to produce effective, clear and easy to use materials for the purpose, a set of common training materials, interactive videos and presentations were developed.

The training model has been adopted in 6 European countries, partners of the REE_TROFIT project: **Denmark, France, Greece, Italy, Bulgaria and Hungary**. Promotion and dissemination within the other European countries was addressed within specific project activities.



3.3 TARGET GROUPS AND KEY ACTORS

Though the main target of the REE_TROFIT training course is aimed at the professional builder, policy makers (Regional or local Public Authorities), Chambers of Commerce and Industry, Professional Building Associations, Training institutes and Housing and Consumers Associations have also been involved in the activities of the REE_TROFIT Project.

Target Groups and key actors involved in the REE_TROFIT project have been the following:

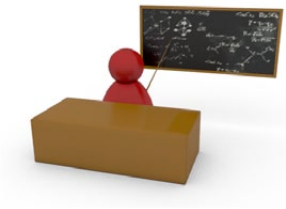
A. Building professionals/technicians from SMEs

Bricklayers, thermo hydraulic installers, electrical installers, plumbers, energy consultants, constructors from SMEs, professionals and their associations, building managers, engineers and architects, and their associations.

Trainees are the main final users of the project: they gained know-how and practical skills on 3 vocational programs regarding technologies and techniques for low energy retrofitting. In addition the training courses provided them with knowledge for advising customers (i.e. home owners) on the most viable and reliable structural and technological options for increasing the energy efficiency of buildings and on the available financial incentives (local/regional) for carrying them out. REE_TROFIT activities resulted in **high participation in the vocational training courses**, and due to the value of the training offered the REE_TROFIT project directly involved **1483 building professionals** in more than **18 localized training events** implemented during 3 years in 6 different European countries. Building professionals were actively involved in the project's realization providing feedback for improving the training and for assessing both their perceived and experienced added value of the training.

They evaluated the correspondence with the market, of the skills provided, through feedback forms at the end of each course and questionnaires, sent to all trained professionals at the end of the project, for keeping a track record of the skills and knowledge that have been used in real life situations.

B. Trainers



Trainers of academic and vocational courses and energy consultants from accredited vocational Training Institutes, Chambers of Commerce, Energy Service COmpanies (ESCO) or universities with competence in low-energy, passive energy, ecological solutions and technological innovation for the rational use of energy in buildings.

Trainers were both targets and key actors of the project. On one side, the REE_TROFIT project directly involved trainers from 9 accredited Training Institutes from 6 European project partners countries, organized in national multidisciplinary teams that were able to develop the training tools and material on retrofitting, building upon and improving their available know-how and resources, and creating also new educational tools.

With a joint and coordinated effort, they shared experience and periodically reviewed the localized training programs; they developed new modules or improved the previous ones. They are actually the spark igniting the process of massive replication of the training programs throughout Europe. On the other side trainers were targeted by dissemination actions of the project and invited to take advantage of the training tools and outcomes of the project. Suggestions and the best practices provided to trainers have contributed to stimulate the replication of training in other regions and Member States. Partners promoted the REE_TROFIT vocational training program on retrofitting to relevant Training Institutes in 12 European countries.

C. Public authorities and policy makers

At the regional, national and EU level. The REE_TROFIT action involved Local/Regional/National Policy Makers in order to evaluate the administrative requirements for the institutionalization of training. The best specific practice and recommendations to Policy makers were developed to suggest how to create and impact markets for qualified retrofitters and more than 170 relevant stakeholders were contacted during project activities.

Policy makers were asked to take actions on incentivizing the qualifications of building professionals, facilitating replication and institutionalization of training, de-bottlenecking the national retrofitting markets for full implementation of the EPBD.

On the whole, the project actions aimed to raise awareness on the necessity to increase energy efficiency in public building, to apply green procurement and to carry out major renovations of public buildings with qualified retrofitters, thus creating a market for certified professionals. It aimed also to stimulate financial incentives (at local/regional level) for private home owners to improve the energy efficiency of their homes, such as: soft loans, grants, direct subsidy schemes and tax reductions.

The adoption of local regulations and norms aimed at stimulating the implementation of an innovative high energy efficiency solution.

D. Citizens, house owners, housing and consumer associations

Citizens and private home owners were directly targeted by the project or through Housing and Consumers Associations as they are the actors making the decision of a monetary investment involving a major renovation of their assets.

Trained professionals able to explain to them the advantages of improving the energy efficiency of their homes by proposing a wide range of interventions represent the best instrument to convince home owners to refurbish their buildings taking into account energy efficiency.

Housing and Consumer Associations were directly addressed by seminars, events, direct encounters, newsletters and mailings as recipients for different issues related to energy efficient buildings.

Housing and Consumer Associations are thought to be crucial stakeholders for the achievement of the EU 2020 target and it is very important that they are properly informed, stimulated and engaged in further assessing the economical viability of retrofitting their homes.

In particular Housing and Consumer Associations are able to:

- simplify access to certified trained/qualified professionals thus creating a market for certified professionals;
- network eco-efficiency retrofitting experiences of HCA associates and private home owners and multiply dissemination of information;
- raise awareness on the necessity to increase energy efficiency in private building and other associations in order to increase demand among their associates (home owners and consumers) who will therefore be stimulated to engage in further assessing the economical viability of retrofitting their homes;
- simplify access to financial incentives (at local/regional level) to private house owners for improving the energy efficiency of their homes, such as: soft loans, grants, direct subsidy schemes and tax reductions.

4. THE REE_TROFIT TRAINING MODEL

4.1 WHY THE REE_TROFIT TRAINING MODEL?

The REE_TROFIT project, through the delivery of a vocational course dedicated to professionals and technicians of the building sector in 6 European countries contributed to the renovation of the sector, supporting the training of a pool of professionals for innovative sustainable technical solutions for energy efficient retrofitting and building.

In the last years, the long recession is increasing the attractiveness of energy saving investments in buildings. In addition, the Energy Performance of Buildings Directive (EPBD) states that "deep retrofits will be crucial to achieving lasting value" requiring integration of renewable technology into existing building structures in a flexible way that takes account of local climatic conditions. The modular REE_TROFIT training model thus provides support to overcome the recession of the building sector in all EU countries toward the renovation of the existing building stock using a more sustainable approach to resources and building materials during both design, building and the maintenance of buildings in order to achieve higher indoor comfort and a saving in resources in terms of energy consumption and materials.

4.2 THE REE_TROFIT TRAINING MODEL: THE CORE STRUCTURE, THE TRAINING METHODOLOGY, THE PROGRAMS

The core structure of the REE_TROFIT training model has been developed on the basis of a user need analysis of building professionals. The REE_TROFIT training programs address 3 different vocational training courses for **Construction Professionals, Electrical Installers, Thermo-Hydraulic Installers** which have been chosen for their direct correspondence with the market of retrofitting and the skills required regarding cutting edge technologies and integrated solutions aimed at retrofitting the existing building stock with energy efficiency solutions and using renewable energy sources.

The REE_TROFIT training model has a modular structure and includes specific shared modules for all the 3 programs in order to ease discussion and knowledge exchange among professionals with different experiences and expertise in order to enhance team working according to the holistic view of building that was thought to be crucial to achieve high quality and performance results.

The main features of the core structure of the vocational training are the following:

- **Modularity**: the courses are composed of independent, closed, domain-specific modules which can be activated according to different training needs with reference to local climate, regulations, market conditions and target group features making easy the adaptation of some specific contents. The course structure is open and may include but is not limited to the following modules, as foreseen in the standard training platform.
- **Short-lasting** (maximum 18 hours) in order to ease the participation of professionals already working in small- and medium-sized companies.
- **Practical and interactive training approach**, in order to make easier the application of acquired skills in a real work situation. The training method aims to illustrate solutions, materials, construction techniques.
- Trainers and speakers for classroom sessions are chosen among designers, architects, engineers and higher building professionals, with long in-field experience about low energy building solutions, or by meeting with representatives of companies producing innovative materials or products for sustainable building solutions.

4.3 THE REE_TROFIT TRAINING METHODOLOGY

The choice of the most useful training methods in relation to the training market context and the target group features involves the following aspects:

- **Case studies** related to real building renovation cases, according to the logic of the guided project works: trainers should analyze, together with the learners, a building renovation case, starting from analysis of the building features and context, and going on with the illustration of the existing solutions (technologies, systems, existing materials) in the different building sections, the identification of feasible solutions and finally the definition of the optimal option in the analyzed case.

- **Brainstorming, discussion, problem solving**: training should seek continuous involvement of participants through analysis and group discussions about explained topics. Of course, the number of attendees affect the active participation during the class work (in order to achieve the most valuable results from the courses, training groups should range from 8 to max 15 people).

- **Illustration of the existing solutions**, through pictures, movies, viewing samples of products (workshop). For each module an exhibition of samples and mock-ups of the representative building products and materials analyzed in the course may be organized.

- **Product exposition or training laboratory** (optional): temporary or permanent showrooms of sustainable building products and systems (also organized with the products' manufacturers), as well as a training laboratory, allow for a "learning by doing" approach helping trainees to better understand and to have a pragmatic and realistic knowledge of the different topics. The activation of this option would ensure that the training contents are transferred to the trainees in a more accelerated manner by assimilating the contents in more familiar subject matters/ themes.

- **Study visits** to building sites where eco-sustainable solutions are implemented: learning through sites and building visits is fundamental for vocational training considering that the trainees would have the possibility to directly experience real examples and realizations of the technologies and solutions discussed during the lessons.

- **Solution of a practical problem**. Practical problems and solutions are provided by the trainers and the trainees are guided through the process of finding the most viable solutions considering both the technical and economical viability. In this case more general information may be supplied according to the holistic approach of the building process. Specific implementation of this approach may lead, in the program's localization phase, to the design of specific integrated modules where trainees of different target groups may be involved, as well as different trainers.

The REE_TROFIT training courses provide tools and knowledge to evaluate pros & cons of different materials, components, technologies and building solutions, in order to choose the better approach to address high indoor comfort and high energy performance in building retrofitting.

Moreover, the vocational courses allow the trainees to take contact and compare products and the materials of companies operating in different fields of the building sector allowing for the establishment of a potential working collaboration, besides the training activities. At the end of the vocational training course, participants are provided with a certificate of attendance and are registered on the on-line repository of the REE_TROFIT web portal in order to increase their visibility toward citizens, housing and consumer associations and customers in need of information regarding building companies and professionals able to implement a high energy efficient retrofitting solution.

TRAINING PROGRAM FOR ELECTRICAL INSTALLERS (16 h)	
Training modules	h
1. ENERGY EFFICIENCY IN BUILDINGS: POSSIBLE SOLUTIONS	2
Technical elements that impact on energy consumption on buildings	
Evaluation and choice of high efficiency energy plants	
Economic evaluation (cost benefit analysis, energy pay back time (EPBT)	
PV panel design and installation	
2. PV. THE PHOTOVOLTAIC GENERATOR AND THE DIFFERENT SYSTEM TYPOLOGIES	2
Solar radiation and working principle of solar photovoltaic systems: the photovoltaic effect	
Technology of photovoltaic modules: monocrystalline, poly-crystalline, amorphous, etc.	
Components of a system: cells, module, panel, array; the balance of systems. Description of the generator	
System typologies (stand-alone, grid-connected)	
Structure typologies: partially and totally integrated, solar tracker systems, etc.	
3. PV. SYSTEM DESIGN AND SIZING	4
Input data for the design: customer site evaluation, customer needs, exploitable surface, radiation depending on the location, etc.	
Orientation and inclination of the panels; choice of modules, inverter, cables	
System sizing	
Specific technical regulations and incentives	
Economic analysis	
4. COGENERATION AND TRIGENERATION PLANTS	2
Co and trigeneration. Distributed generation and micro-cogeneration	
Turbines and Microturbines. Working principles	
The absorption refrigerator and its working principles	
Economic analysis	
Specific technical regulations and incentives	
5. WIND TURBINE	1
Eolic energy: working principles and wind analysis	
Wind turbines classification: micro, mini turbine etc.; where and when to install a wind turbine	
Integration of different systems	
Economic analysis	
Specific technical regulations and incentives	
6. ENERGY SAVING LIGHTING SYSTEMS	3
Light shelf	
Fluorescent lamps	
Led, lec, optical fibers lighting	
Solar light pipes installation – sun pipes	
Specific technical regulations and incentives	
7. HOME AUTOMATION FOR ENERGY USE OPTIMIZATION	2
Programmable thermostats (heating/cooling control), lighting control, ventilation control, solar shading devices control, etc.	

TRAINING PROGRAM FOR THERMO-HYDRAULIC INSTALLERS (18 h)	
Training modules	h
1. BASIC ELEMENTS RELATED TO THE CRITERIA FOR THE CALCULATION AND VERIFICATION OF ENERGY CONSUMPTION IN BUILDINGS	2
Technical elements that impact on energy consumption on buildings	
Evaluation and choice of high efficiency energy plants	
Economic evaluation (cost benefit analysis, energy pay back time (EPBT)	
2. CENTRAL HEATING: HEAT PUMPS AND GENERATORS	4
Heat generators: standard, low temperature, condensation	
Condensation boiler: principles, combustion gases expulsion, condensate treatment, system optimization	
Absorption heat pumps: principles of operation, coefficient of performance, sources of heat (air, water and land), installation and use, criteria for dimensioning and configuring, assessment and cost effectiveness	
Co and tri-generation systems	
Specific technical regulations and incentives	
3. SOLAR THERMAL	3
Solar radiation, solar panel working principles	
Collectors typologies	
System typologies (integration level, natural/mechanical circulation, etc.)	
System sizing	
Practical installation information	
Required authorizations to install solar thermal systems	
Specific technical regulations and incentives	
4. BIOMASS HEATING SYSTEM	2
Biomass as renewable energy source: forest residues, yard clippings, wood chips	
Biomass conversion process: the combustion	
Criteria for the selection of the best system	
System sizing, installation and setting up	
Cost benefit analysis	
Integration with other systems	
Specific technical regulations and incentives	
5. GEOTHERMAL PLANTS	2
Working principles	
Components	
System sizing	
Cost benefit analysis	
Specific technical regulations and incentives	
6. ENERGY SAVING SYSTEMS	2
Thermostatic radiator valves, etc. (heating/cooling control)	
Heat recovery ventilation, under-floor, wall and ceiling heating and cooling systems	
Specific technical regulations and incentives	

7. WATER RECYCLING SYSTEMS	1
Reuse of grey water and rain water	
Aerators and low flow showerheads, toilet drains, etc.	

8. VENTILATION SYSTEMS	2
Specific technical regulations and incentives	
Air quality control systems	
Mechanical/Natural ventilation	

TRAINING PROGRAM FOR CONSTRUCTION PROFESSIONALS (17 h)	
Training modules	h

1. BUILDING RETROFITTING AND ENERGY SAVINGS	4
site analysis	
energy consumption analysis before/after intervention	
general principles of an efficient building envelope	
local climatic conditions	
energy efficient buildings local, national and EU regulations	
local incentives for sustainable practices	
sustainable retrofitting costs/benefits analysis	
holistic approach. Importance of perfect realization	
specific technical regulations and incentives	

2. VERTICAL OPAQUE ELEMENTS	3
ventilated walls	
insulation: thermal insulating plasters; insulation (caulking) overcoat; high caulking structures	
thermal bridges: problems and solutions	

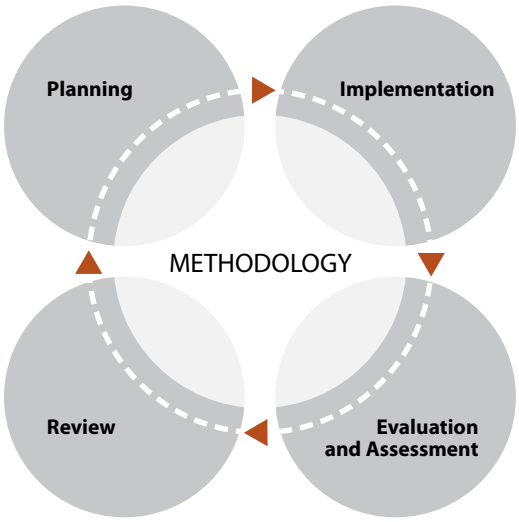
3.TRANSPARENT ELEMENTS	3
Glass typologies (triple float glasses, low emission, sun protective glazing, etc.)	
Double-glazed walls	
Insulation and shading devices	

4. HORIZONTAL ELEMENTS	3
Ventilated roof; green roof	
Insulation: thermal insulating plasters; insulation (caulking) overcoat; high caulking structures	
Thermal bridges: problems and solutions	
Acoustic solutions for floors and roofs	

6. INTEGRATION AMONG DIFFERENT CONSTRUCTION SYSTEMS AND COMPONENTS	4
PV integration (PV tiles, totally integrated PV panels)	
Passive/active solar thermal heating/cooling	
Lighting	
Water cycle (rain and grey water recycling)	
Ventilation	
Radiant heating	

5. THE REE_TROFIT TRAINING COURSES

During the project duration, the localized vocational courses have been implemented through 3 test trials (rolling cycles) in each of the 6 participating countries. The rolling cycle approach allowed the training programs to be tested, improved upon and optimized for the following training batch, using the "plan-do-check-act" strategy.



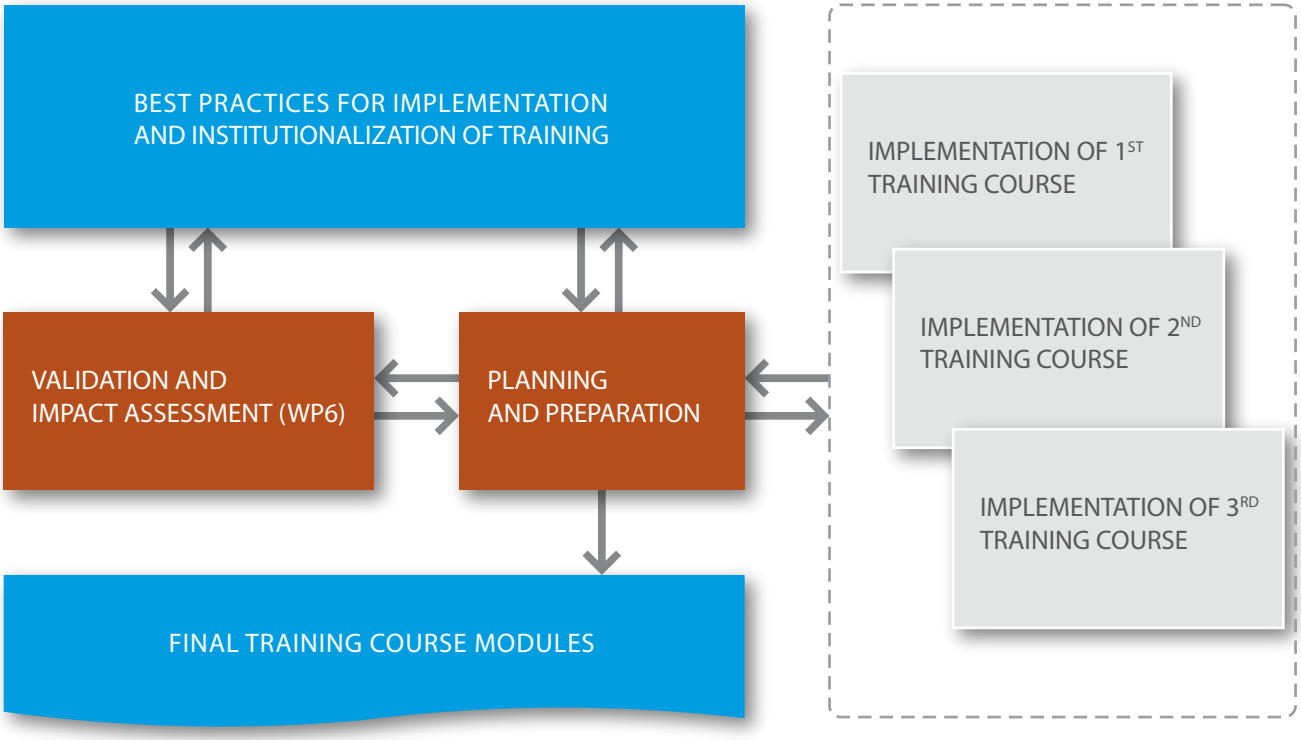
5.1 THE REE_TROFIT PROJECT ACTIVITIES

A preliminary study helped to understand which were the procedures and the requirements, strategies and approaches for institutionalization of training in each country and to define a methodology for an efficient organization and implementation of the training.

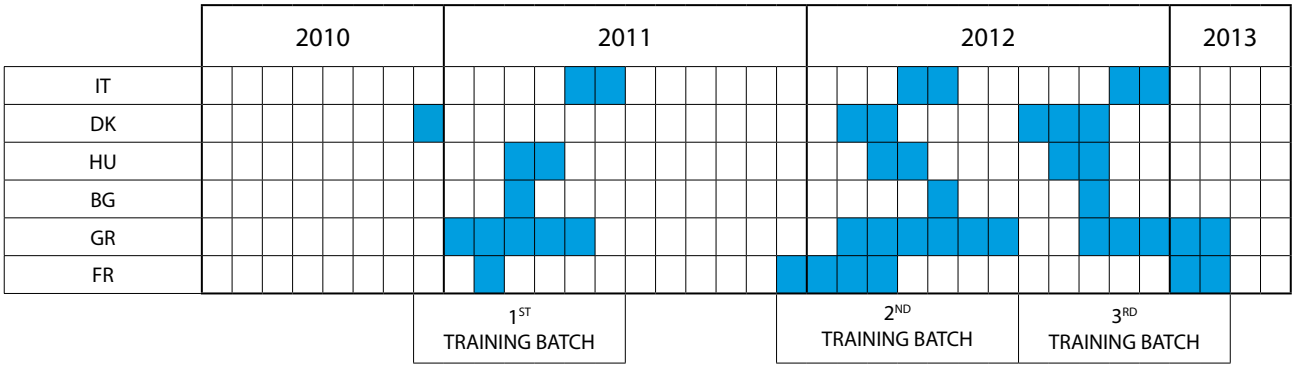
With reference to local climate, regulation, language, already existing vocational training, the REE_TROFIT training programs were localized in each of the 6 partnering countries. In particular, while in France and in Denmark, the REE_TROFIT training programs were adapted to the local market needs selecting specific topics, in Italy, Bulgaria, Hungary and Greece the vocational programs were localized with minor adaptation of the common platform.

Courses were implemented in rolling cycles and partners organized, promoted and delivered vocational training courses over 3 iterative test batches in the 6 partner countries. Following the plan-do-check-act strategy, after each cycle, feedbacks from participants were collected and analyzed with a specific validation methodology, the training contents were enriched (e.g. new modules and multimedia) and the methodology improved through annual internal trainers' review workshops. Preparatory activities, organisation and delivery of three batches of training courses in each partnering country were successfully performed. This activity aimed at setting up the logistics for implementation of courses (identification of training classes, administrative requirements, printing of training material, etc.) and the promotional activities for attracting trainees (printing and dissemination of leaflets, brochures and leaflets, posters, press releases, communications to various stakeholders and invitations to building professionals, etc). Each test batch lasted for approximately 7 months. Before implementation, modules and materials from the European Training Programme were prepared and localised. The content of the training were different for each test batch and were gradually enriched with even more advanced and attractive material covering all thematic areas of the REE_TROFIT Training Programme.

The number of participants was higher than expected: 1483 professionals were trained (instead of the 450 foreseen participants), among which 453 electrical installers, 512 thermo-hydraulic installers, 518 construction professionals. 1293 trainees out of 1483 participants (87%) obtained a Certificate of Attendance. Moreover, the REE_TROFIT training courses resulted in positive evaluation by trainees, in particular the overall evaluation about the training courses resulted on average 4,4 on 5. The evaluation of trainees was addressed as described in the "Manual of validation strategy" and it is expressed using a scale of 1 (low) through 5 (high).



TRAINING COURSES TIMELINE



TRAINING CYCLES

	BG			DK	FR			GR			HU			IT			
	Electr	Th-hydr	Constr	Electr Th-hydr Constr	Electr	Th-hydr	Constr	Electr	Th-hydr	Constr	Electr	Th-hydr	Constr	Electr	Th-hydr	Constr	**TOTAL**
N. of delivered hours	48	48	48	80	49	49	91	112	90	85	36	36	41	48	54	54	**969**
N. of participants	52	54	55	150	11	8	58	187	216	188	111	120	121	42	64	46	**1483**
N. of qualified professionals	48	50	52	150	0	0	0	164	203	182	101	112	118	34	47	32	**1293**

Besides training activities, during the project duration the promotion of the REE_TROFIT training model was aimed at gaining the endorsement of institutions and stakeholders in each partner country; also involving the national Chambers of Commerce (Italy, Bulgaria, and Hungary), professional associations (Hungary and France) and specific training institutes (Greece and Denmark) with the aim of ensuring the highest and broadest level of institutionalization of the localized training courses (*see section 5.3*).

Promotion toward relevant training institutes and regional/national policy aimed to the sustainability of courses was also addressed: 228 stakeholders were contacted, of which 55 are training institutes.

EVALUATION OF TRAINEES	
General opinion about the training courses	4,4/5
Acquisition of new knowledge and skills	4,2/5
Job usefulness	4,2/5
Adequacy of time dedicated to each topic	4,0/5
Capability to effectively apply the knowledge or skills on the job	4,1/5
Level of interest for the topics	4,2/5
Trainers evaluation	4,6/5

5.2 THE REE_TROFIT DISSEMINATION

Several dissemination activities were carried out during the course of the action. First of all, the project website is available in seven languages (**www.reetrofit.eu**) and contains project description, outlines, news and outcomes. The website was launched in June 2010 (within six months after the start of the project) and more than 1500 accesses to the website was counted during the project duration. Moreover, comprehensive dissemination material was made available: flyers, posters and brochures were produced with the purpose of further spreading the results at various kinds of events. The project leaflet explains the project and its activities in short. The leaflet has been printed and was distributed at workshops and conferences, and is also accessible on-line.

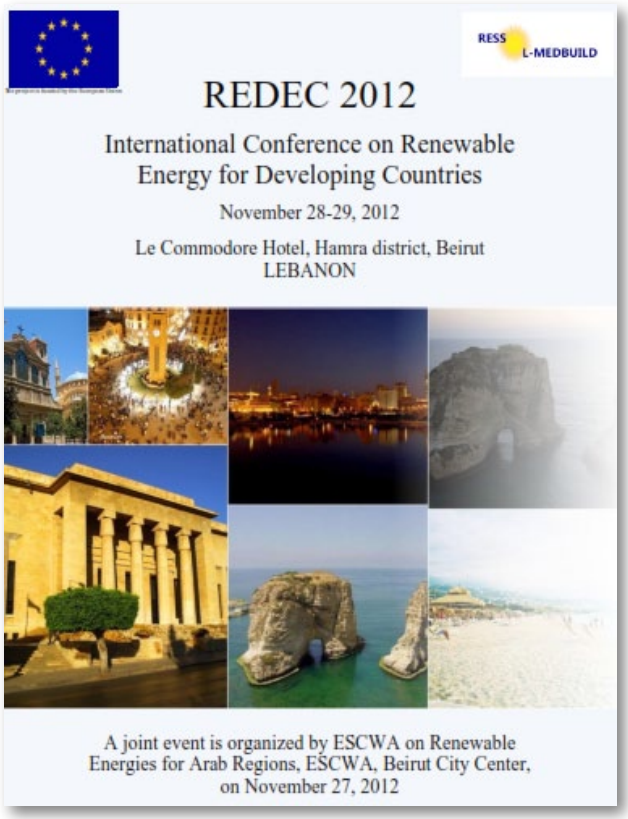
All in all, several different kinds of publications were disseminated locally, regionally, nationwide or EU wide. The publications comprised 10 electronic newsletters distributed to all the relevant local stakeholders, articles in business magazines or press releases.

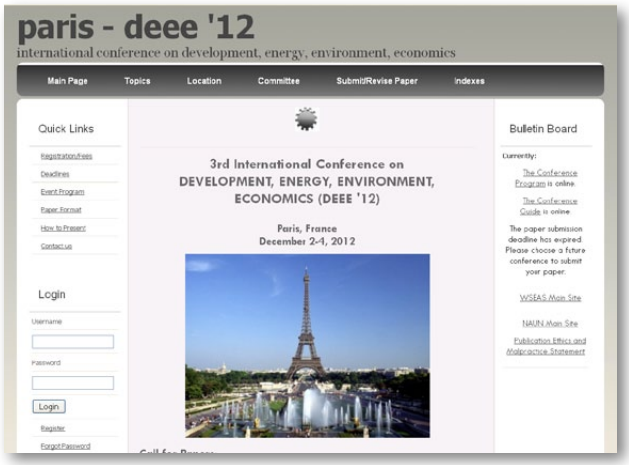

ENERGIA L'IDEA COINVOLGE SEI PAESI DELL'UNIONE. FINANZIAMENTO DA 1 MILIONE E 500MILA EURO

Edilizia, presentato il progetto europeo «Ree Trofit»

Additionally, during the project lifetime the REE_TROFIT team took part in different exhibitions and conferences adding value to these events by holding a presentation or presenting a poster about REE_TROFIT activities. The topics covered ranged from more general energy efficiency progression to more specified topics.

Communication and dissemination activities aimed for a broad dissemination of the project results amongst the stakeholders to the REE_TROFIT project: policy makers, building companies (especially SMEs), housing and consumer associations, home owners. Dissemination of results was achieved via web, leaflets, newsletters, workshops, articles, papers, and targeted presentations at conferences, meetings and exhibitions.





5.3 THE REE_TROFIT TRAINING MODEL TOWARD THE INSTITUTIONALIZATION PROCESS

In the last years, the need of a common European Qualifications Framework (EQF) has grown in order to make national qualifications more readable across Europe, through the European Credit system for Vocational Education and Training, and to promote workers' and learners' mobility between countries and facilitate their lifelong learning.

In this dynamic regulative context and considering the rising of new roles in the building sector due to the uptake of innovative technologies and solutions, the institutionalization of the REE_TROFIT training approach has been a complex issue to face, due to the different levels of implementation of both European and National input raising regulations in the field of professional training and certification.

However, the REE_TROFIT project was able to identify the relevant conditions in order to facilitate institutionalization of the REE_TROFIT training model in each of the partnering countries and different strategies were used in different countries to address this final goal and guarantee the highest sustainability of the training model. On the whole, due to the high participation of the Chambers of Commerce in the consortium, the Chambers network was recognised to be the most reliable way to address the endorsement of institutions for the REE_TROFIT training model in the partnering countries. In fact, the need to operate at country level, with adequate efforts and with all relevant stakeholders on board to de-bottleneck the local market condition for building professionals, is openly recognised by the European Build Up Skills initiative. Build Up Skills is to date the main European landmark to improve the qualification and skills of Europe's building workers and it aims to elaborate specific roadmaps at the level of member states with direct involvement of all relevant national stakeholders.

Thanks to the REE_TROFIT partnership, during the project duration, contacts have been made and strengthened with several European Chambers of Commerce, Training institutes and other selected organizations and institutions in order to gain their interest in the REE_TROFIT vocational training courses. Considering the different local contexts, the institutionalization of the training model has been achieved with different specific approaches and local strategies focusing on the endorsement of relevant stakeholders. As a result, due to the endorsement of several institutions, high level of participation to the REE_TROFIT training courses was secured. Results of this activity are reported in the table below.

Country	Institution involved	Outcome toward REE_TROFIT institutionalization
IT	National Italian Union of Chambers of Commerce.	"Committee on Sustainable Building Industry" inside the National Union of Italian Chambers of Commerce adopted and promoted the REE_TROFIT model toward the Italian Chambers of Commerce.
DK	Regional Vocational Training Centre - EUC-North.	The REE_TROFIT model was adopted by EUC-North which collaborated in the delivery and promotion of training activities, also beyond project duration.
HU	Hungarian Chambers of Commerce.	FAT (National Adult Training Accreditation Committee) accreditation requested for the REE_TROFIT training model in Hungary.
GR	TEIC (Technological Educational Institute of Crete), Region of Crete, Technical Chamber in Greece.	TEIC as Higher Educational Institutes, requested the certification for the REE_TROFIT training to the Greek authorities.
BG	Bulgarian Chambers of Commerce, high school of civil engineers and architects in Sofia and University *Chernorisetz Hrabar* in Varna.	Bulgarian Chambers of Commerce, high school of civil engineers and architects in Sofia and University *Chernorisetz Hrabar* in Varna have adopted the REE_TROFIT training model.
FR	Recognized Grenelle Environment (RGE): quality mark issued to French companies about energy performance improvement work on buildings.	A procedure was define to obtain the quality mark RGE for the REE_TROFIT training.

6. IMPACTS OF THE REE_TROFIT PROJECT AND SUSTAINABILITY AFTER ITS END

The impacts of the REE_TROFIT project have been evaluated using a bespoken methodology whose assumptions are referring to the average values of the features of the European buildings (e.g. average floor area, external surfaces, average number of rooms, etc).

The developed methodology permitted the evaluation of the impacts of the REE_TROFIT training taking into consideration also the following input data:

- the number of trainees per year;
- the number of retrofitted houses, per year, per each trainee;
- the average mix composition of the intervention analyzed (e.g. installation of flow water aerators, installation of electrical heat pump, installation of high efficiency conditioning systems, installation of high-efficiency fluorescent lamps, installation of photovoltaic plants, replacing plain glass windows with double glazed windows, etc…).

Data about energy savings related to each type of intervention have been collected from the reference schemes prepared by relevant generalized National Authorities. These reference schemes show an evaluation of energy savings, expressed in tons of oil equivalent (TOE), gained from various types of interventions (buildings, electrical and hydro-thermal installations). The impact of the project activities by 2020 are reported in the table below:

IEE Common Performance indicator	Planned target	Actual achievement
Renewable Energy (toe/year)	260	471
Primary energy savings (toe/year)	4568	5739
Reduction GHG emissions (t CO2e/year)	12836	16126

The higher number of trained professionals within the whole REE_TROFIT project (1483 as compared to 450 foreseen) resulted in a higher overall impact of the project activities.

The activities after the end of the REE_TROFIT project continue. The training course has been transferred also to other organizations in the partnering countries and further vocational training following the REE_TROFIT model is going to be implemented and will be integrated into several further projects, on a regional and national level.

ITALY

The REE_TROFIT model was introduced to the network of the Italian Chambers of Commerce. A specific "Committee on Sustainable Building Industry" inside the National Union of Italian Chambers of Commerce was created. Thanks to the action of the Italian REE_TROFIT partner, the committee recognized the REE_TROFIT model as the most advanced training model experimented by the Italian Chambers of Commerce and took therefore action for its promotion and adoption by the Italian Chambers of Commerce. Moreover, the replication of the training model is supported by the Chamber of Commerce of Lucca, which, together with LUCENSE, will organize in the next years, an annual edition of the course.

GREECE

Some of the training material from the REE_TROFIT project has already been added to the training program of young engineers. Moreover, since all the training events were well attended and many others asked for a replication of the training with the inclusion of more specialized seminars, dedicated training events are going to be organized by TEI of Crete. TEIC is actually in touch with all the technicians' associations in Crete to design future actions in this direction.

HUNGARY

Training sessions were prepared in close collaboration with the EVOSZ trade association and with the Hungarian Chamber of Engineers allowing the REE_TROFIT training model long-term operating. In fact, the involvement

of the above mentioned trade association and the Chamber of Engineers permitted participants to the trainings (engineers, designers, implementers) to get credit scores, contributing to the extension of the program's sustainability, laying the foundation for the organization of trainings and projects together in the future.

FRANCE

The REE_TROFIT training modules have been integrated in the training catalogue and highly promoted among SMEs. Due to the implementation of the French thermal regulation, an interest for the REE_TROFIT modules is increasing, since the new regulation requires professionals to improve their skills in low energy building. In addition, the collaboration with the qualification organism Qualibat, supported the institutionalization process of the training courses in order to ensure that the SMEs attending the REE_TROFIT modules could have the RGE recognition. RGE, "Reconnu Grenelle de l'Environnement", is a quality sign created by the French government promoted among building owners to allow them to identify qualified professionals for low energy retrofitting.

DENMARK

During the course of the project, several sector stakeholder and institutions were involved in the effort to raise participation in the courses and cooperation with EUC-North (Regional Vocational Training Centre) and EUC-North-West-Seeland was established and programs were incorporated in their vocational training offer. In addition, the third Danish training batch was delivered in cooperation with the local municipal authority, the Municipality of Aarhus, and with the district heating company AFA. The training will be a continuing process since an agreement with AFA will allow the local vocational trained companies to follow the results, and eventually to identify further needs and develop additional training if it is necessary.

BULGARIA

In order to assure the REE_TROFIT project's sustainability, appropriate material was worked out for building professionals based on the REE_TROFIT training model and containing national and EU regulations regarding the project's topics, the best practices in Bulgaria as well as in Europe. Modules of the REE_TROFIT training programs are actually implemented in Varna Technical University for Civil Engineers and Architects and in the secondary school "John Atanassov" in Sofia demonstrating the sustainability of the REE_TROFIT experience. REE_TROFIT results are shared with the National Agency for Vocational Education and Training in order to support the REE_TROFIT training model as the most suitable format for acquiring skills and knowledge in the field of construction industry as short-term VET.

7. SUCCESS STORIES

7.1 ITALIAN SUCCESS STORY

Interview with Marco Ricci, trainee of the Italian REE_TROFIT courses for construction professionals.

Hi Marco, thank you for your willingness! First of all, was the REE_TROFIT training course a positive experience?
"Definitely it was! REE_TROFIT was a great opportunity to improve my knowledge and skills about innovative technologies and solutions to be applied in retrofitting building. I appreciated a lot the method, which involves several practical applications, trainers were experts with a lot of on-site practical experience."

What are the most important aspects of the REE_TROFIT experience?
"I found the topics discussed during the training very interesting and, after the training I could apply several times the concepts learned, in particular during the evaluation of the building site for an analysis of the intervention to implement, for the choice of the methodology for retrofitting as well as of the best solution to obtain the highest energy efficiency. A wide knowledge of the possible solutions allowed me to discuss with other professionals and get advice about the best solution. I appreciated the first shared module in which different professionals could interact and discuss with each other."

Would you suggest the course to other professionals in the building sector?
"Yes, of course! In my opinion the REE_TROFIT course had a good balance between duration and objectives. The solutions described allowed one to have a 360° view about issues and their potential solutions for high energy efficiency retrofitting of buildings. I am waiting for the next training event because I realized that a proper long-life professional training about innovative technologies and solutions would allow me to be more effective and competitive in the building market".

Interview to Eng. Marco Ginanni, teacher in the second and third batch of the Italian REE_TROFIT training courses for thermo-hydraulics.

"Personally, I am very pleased and gratified by the REE_TROFIT experience, in particular by the positive feedback shown by installers and constructors. In fact, I noticed high interest about the topics discussed and participants showed convinced participation in the debate and in the exchange of experiences. In particular, I found a growing awareness about the need to improve knowledge and skills related to renewable energy and energy savings in the building renovation as these issues represent the future in the field of building and construction: participants were definitely aware that a basic knowledge about low energy retrofitting is essential for everyone, including technicians and installers."

What are the most important aspects of the REE_TROFIT experience?

"During the training course I could experience how innovative concepts of energy saving and correct approach to low energy refurbishment were increasingly assimilated by participants. I am proud take part of the REE_TROFIT experience and I would like to point out that a permanent work relationship was established after the course with some trained electrical installers and thermo-hydraulics who started to apply the knowledge acquired during the REE_TROFIT courses in their professional activity. REE_TROFIT represents, in my opinion, a positive and integrated approach to vocational training in the building sector."

7.2 FRENCH SUCCESS STORY

Interview with Sabine Belle, Néopolis training centres of the Chamber of Commerce and Industry of French department Drôme.

"Néopolis's activity is dedicated to the trades in the field of sustainable development, applied in the construction sector and the participation in the REE_TROFIT project allows the capitalization of ten pilot trainings that are now featured in a comprehensive range of vocational training to face the energy challenge in building retrofitting. Within REE_TROFIT training modules, optimal balance between theoretical inputs and practical implementation was reached while aiming to develop practical know-how for undertaking the work of thermal insulation (internal and externally), joineries integration, renewable and ventilation systems installation to obtain a low-energy retrofitted building."

What are the most important aspects of the REE_TROFIT experience?

"All modules deal with air tightness, vapour transfer, air quality, building details (singular points) highlighting the importance of cooperation between different building jobs. As a matter of fact, Néopolis encourages SMEs from different building sectors (e.g. masons, plumbers, electricians, plasters, carpenters) to participate together in practical sessions with the purpose to learning how to work together in order to reach the final performance results thanks to a collaborative and holistic approach. With this approach the REE_TROFIT project sustained the idea that the achievement of energy performance in building involves not only new knowledge but also a new organization of building professionals within a cross-sector approach."

7.3 BULGARIAN SUCCESS STORY

Interview to Irina Terzyiska, project manager at the European Labour Institute, Sofia (BG).

What is your opinion about the REE_TROFIT experience?

"The objective of the REE_TROFIT project was to produce an innovative, transferable, efficient model for VET in the retrofitting sectors with concrete platforms for the training of 3 types of professionals and to test it using a holistic approach. ELI together with BCCI organized one pilot and 2 further series of trainings and the final result is that a new short-term VET model was created, which was gradually tested and improved. In my opinion, the REE_TROFIT experience has been very successful and interesting."

Which are the most innovative features of the REE_TROFIT approach in Bulgaria?

"The REE_TROFIT project was able to attract a very broad audience embracing not only SMEs active in the retrofitting market, but also public authorities and energy agencies, decision makers in the training process, local Chambers of Commerce, which organize VET trainings for their members, training institutions, secondary schools and higher technical institutes enabling them afterwards to integrate modules of the REE-TROFIT trainings in their curriculum. Thus, the main innovative aspect of the Bulgarian courses has been the attendance of almost all present and future stakeholders of low energy building retrofitting. Moreover, the REE_TROFIT approach exploited different methodological schemes in order to find the optimal model for the BG retrofitting market. A good balance was found between the theoretical and practical training. Presentations of producers and on-site visits to working RES projects, sites with PV plants, were organized followed by professional analysis and exercises for integral retrofitting solutions."

7.4 HUNGARIAN SUCCESS STORY

Interview with Anita Toth, Chamber of Commerce Bács-Kiskun County, Hungary.

Anita, what is your opinion about the REE_TROFIT experience?

The REE_TROFIT project was a real success story from the point of view of the Chamber of Commerce Bács-Kiskun County. We were very pleased about the main aims of the project, because they are fully in line with the aims of the Chamber. We have daily direct contact with the entrepreneurs in the field of construction industry, which represented the main target group of REE_TROFIT, therefore we had information about their demands. As prescribed by law, the obligatory registration of the construction companies gave us a full database on these companies; it was very simple to target them.

What are the most important achievements of the REE_TROFIT experience in Hungary?

The REE_TROFIT training batches were very popular both in Kecskemét and in Kiskunhalas and some entrepreneurs attended all 3 training batches. Moreover, several people attended the side event held in Kalocsa highlighting the success and usefulness of the project activities, demonstrated by the high presence of professionals. In my opinion, the cooperation agreement with the National Federation of Hungarian Contractors (ÉVOSZ) fostered the development of professional ties and the exchange of information between member organizations as well as among Hungarian and international organizations. The BKMKIK is going to continue the activities in the same direction following the footprint of the REE_TROFIT activities, ensuring the sustainability of the project results."

8. LESSON LEARNED & CONCLUSIONS

Networking among partners and relevant training stakeholders gave important input and were crucial for the success and acceptance of the project in the targeted audience. Partners gave a fundamental support to the identification of barriers and needs in the building sector and to the selection of strategic actions for implementing successful training in a local context.

The vocational training had to be tailored according to the local market and had to fit with already existing and established structures and activities.

The localized guidelines were welcome by targeted stakeholders.

End-user evaluation (trainers and trainees) as well as the rolling cycles approach had a very effective result within the frame of an integrated training approach for the sustainable solution to building renovation.

The endorsement of relevant stakeholders is a powerful and strategic way to sustain and successfully promote vocational training and to encourage the establishment of a collaboration among building professionals with different expertise in order to boost the high energy efficiency retrofitting of existing stock while giving support to effective renovation within the building sector.

Trained professionals are a valuable tool to advise house owners about the importance of energy efficiency in building and directly promote low energy technology and solutions for building retrofitting.

Experience exchange among professionals working in different building sectors and practical approaches to the training is crucial to obtain a successful cooperation within the frame of the integrated training approach.

9. ACKNOWLEDGMENTS

The REE_TROFIT team would like to thank the EU/EACI for their financial support in making this project possible. The REE_TROFIT team would also like to thank local and regional players taking part in the training and dissemination activities.

The REE_TROFIT team will continue working on training the building workforce on energy efficient solutions and will promote the implementation of a low energy approach to the retrofitting of buildings.

We invite the readers to stay informed about our future activities and to contact us for any further information. Visit our website www.reetrofit.eu including contact details of the REE_TROFIT team.

ree_trofit

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