



SouthZEB WP6-Task1.1:

**Deliverable 6.1:
Development of the
assessment plan**

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Executive Summary

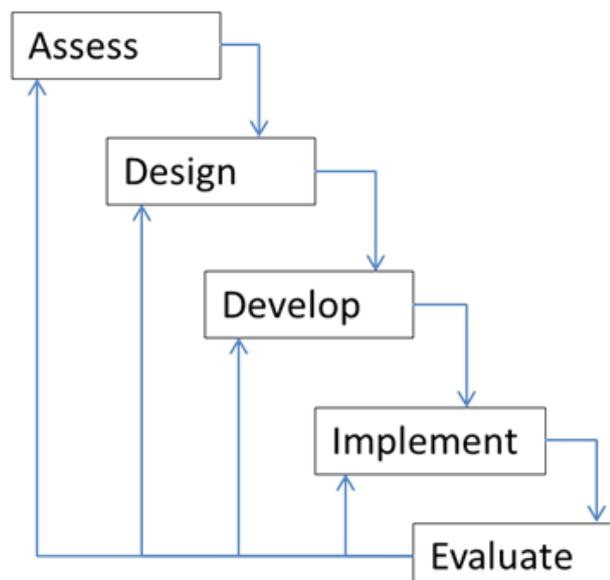
The assessment and evaluation plan serves as a management tool for the project and aims to provide information on requirements for workshops, training material and portal realisation. The assessment of the project will allow the systematic determination of the results of the training modules allowing for the continuous improvement of the project.

The objective of the project is to design and develop training and assessment programmes for the building professionals (i.e. architects, engineers) focussing especially on the transfer of successful practices and knowledge from the front runner countries (i.e. UK, Austria) to the southern European Union (EU) countries.

There are ten training modules to be developed in total; eight of these will provide training for architects, engineers and municipality employees. The modules will be based on recognised and successful professional development courses and special emphasis will be paid to the building traditions of the participating countries. Two special training modules will also be developed for construction management and field supervision of nZEB as well as for training the decision makers in the preparation of appropriate funding schemes and other incentives for promoting nZEB.

This document is designed to assist the process and outline good practice in developing the training material for the SouthZEB project in addition to help plan and conduct the courses. It aims to provide information on the main steps and the stages in sequence of designing a training course all the way to evaluation.

The plan follows the instructional design model called “ADDIE” which is an acronym of the main stages of the process: assess; design; develop; implement; and evaluate as outlined below:



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1 Introduction

The assessment and development plan will aim to provide a consistent method of developing the training modules required and also assist in the uniform delivery of workshops and training material. The necessary information required for workshops, training material and portal realisation will be outlined to ensure that the training meets the project objectives. The instructional design model called “ADDIE” which is an acronym that stands for the main components of the process has been followed and comprises the following stages:

- Assess
- Design
- Develop
- Implement
- Evaluate

This document will assist in the design and development of the training and aim to incorporate the appropriate actions and element into training plans, training approaches and evaluation. Guidance on the different delivery methods as well as guidance to support the trainers in the presentation of the training material will be provided to ensure that a plan is in place for training delivery which can be utilised by different certified trainers. The guidance will help provide the trainers to do the following:

- Facilitate, manage the audience, question and give feedback;
- Conduct learner-centred activities that promote retention and transfer of knowledge and skills; and
- Evaluate training and training sessions using the expert advisory board/feedback questionnaires.

In addition to the above, a guide to adult learning principles has also been included. Paying attention to these training principles may give a greater chance for effectiveness.

1.1 Work package 6.0

The overall aim of work package 6.0 is to detail project evaluation, quality control and conformity to directives. The scope of this work package is to continuously monitor the project and its outcomes, in terms of quality and impact of the action. Additionally, conformity to the targets and directives set by the EU and local authorities in the target countries will be closely monitored within this Work Package. Task 1.2 requires the development of an assessment plan and this document will detail the assessment and evaluation plan which will provide information on requirements for workshop, training material and portal realization. These requirements will be passed to work package 3.0, 4.0 and 5.0 in order to ensure that the portal, workshops and workshop content are developed in a suitable manner as to gather the needed evidence for their assessment. The plan will describe the evaluation procedure and toolkits that will be used as outlined below in figure 1.1.

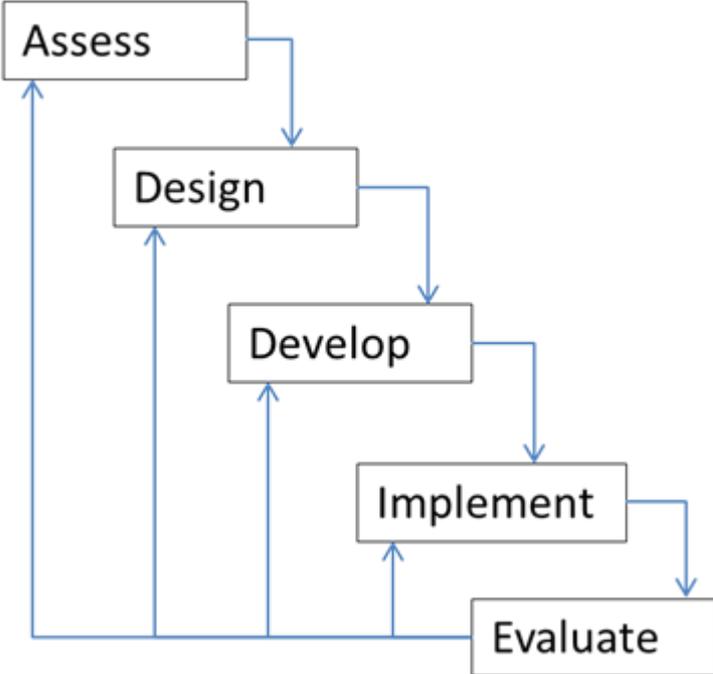


Figure 1.1: Assessment and Evaluation Plan Stages Schematic

2 Assessment

2.1 Main issue/problem

The recast Directive on the energy performance of buildings stipulates that by 2020 all new buildings constructed within the EU after 2020 should reach nearly zero energy levels. A question that arises is whether or not the number of architects and engineers that are able to deal with new technologies and standards is adequate. Technically every designer should be able to build an nZEB; in practice those designers need to keep up with standards and requirements that have to be fulfilled to build at nZEB levels.

Training programs could overcome this barrier. Some attempts have been made to develop training and certification schemes for nZEB professionals, all of them by non-governmental organisations and none of them has become official. Some countries have shown significant commitment to the EU targets and have focused on nZEB prior to others. In most south EU countries though, there is still a lot to be done.

This project comes to fill-in this gap and address the need of developing training and assessment schemes for intermediate and senior professionals involved in the nZEB building process (engineers, architects, municipality employees, decision makers) focusing especially on transferring successful practices from the front runners to the EU countries less advanced in this area.

The training modules to be developed will be adapted to the participating countries specific needs and regulations. A key novelty of SouthZEB is also the special emphasis that will be paid to the building traditions of the participating countries; e.g. how to apply the nZEB policies in traditional villages and areas of tight architecture regulations that exist in all South EU countries.

2.2 Project aims and objectives

The objective of the project is to design and develop training and assessment programmes for the abovementioned professionals, focussing especially on the transfer of successful practices and knowledge from the front runner countries (i.e. UK, Austria, Germany, and France) to the south EU countries.

The modules will be based on recognised and successful professional development courses and will be adapted to the participating countries' specific needs and regulations. Special emphasis will be paid to the building traditions of participating countries. Training modules will also be developed for construction management and field supervision of nZEB as well as for training the decision makers in the preparation of appropriate funding schemes and other incentives for promoting nZEB. Best practice examples from successful programs in the most advanced (in this area) EU countries will be used in the training programs.

Eight training modules for Architects, Engineers and Municipality Employees in the South EU countries will be developed; two special training modules for construction management and field supervision of nZEB as well as for training the decision makers in the preparation of appropriate funding schemes and other

incentives for promoting nZEB. Ten assessment exams, one for each of the above training modules will be created.

The goals of the project comprise the following:

- At least 150 trainers will be trained, using the modules and portal
- At least 1,500 professionals (engineers, architects, municipality employees, decision makers) will be trained on nZEB training modules
- At least 400 professionals trained remotely through the e-learning platform (part of the 1,500 above)
- At least 3.000 user registrations in the portal by the end of the project
- Four new funding/promotion schemes for nZEB designed, one in each of the South European participating countries (i.e. Greece, Cyprus, Portugal and Italy).

3 Design

The Design stage of the assessment and evaluation plan will provide information on requirements for workshop, training material and portal realisation. As previously mentioned these requirements will be passed to Work Packages 3.0, 4.0, and 5.0 in order to ensure that the portal, workshops and workshop content are developed in a suitable manner as to gather the necessary evidence for their assessment. Figure 3.1 outlines the steps, elements and actions, to be used when producing the training content for the modules outlined in section 3.3.

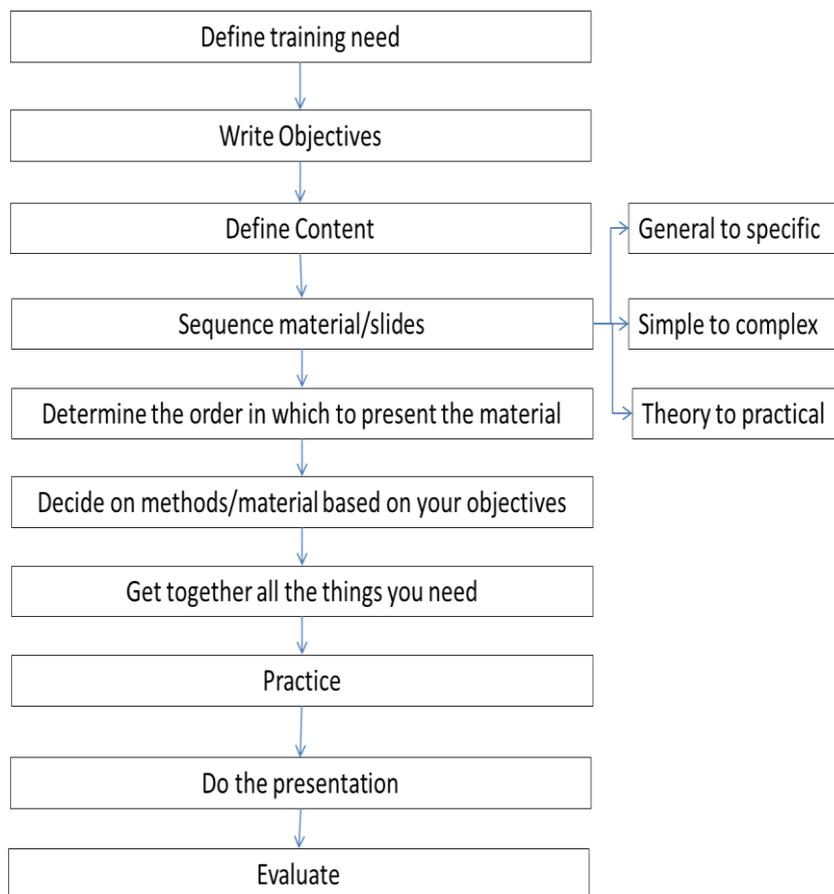


Figure 3.1: Creating Training Material

With regards to the training materials required, in addition to following the steps in figure 3.1 when developing the content, ask the following questions:

- What content should be covered?
- In what sequence should the subject be covered?
- How deeply must each subject be covered?
- How will each subject be connected to others?
- What methods will you use to present the subjects?
- What training materials are needed?
- Where will the training happen?
- How will you assess learning progress?
- When will you schedule the training?
- When will the evaluations take place?

3.1 Previous Initiatives

A number of previous initiatives have been undertaken in an attempt to promote the concept of nZEB in the South EU countries. When answering the above questions, the projects/courses developed/completed previously should be used as guidance and a starting point for the development of the training material for SouthZEB. Previous projects which have been successfully implemented include:

- CEPH:

This project ran from 2008 to 2011 and brought together stakeholders from across Europe, who already had experience in Passive House Design training. Based on this knowledge the most experienced consortium partners generated a ten-day intensive course in Passive House Design. The participants were all from Central and North EU regions, with the exception of Italy, which as explained in previous reports, is considered advanced in nZEB only in northern regions. Project outcomes including the training material which is publically available, can be used as a starting point for the Southzeb training modules.

<http://www.passivehouse-designer.org/>

<http://eu.passivehousedesigner.de/>

- ILETE:

This was another IEE co-funded project which ended in 2009 and achieved to set up eight seminars on low energy consumption in buildings thanks to the work of a European Group of Experts, all professors in schools and universities of each partner region. It also set up common training kit composed by modules

adapted for building professional stakeholders. It is not focussed on nZEB, but the material and kits produced can be used by the nZEB consortium in the training seminars implementation.

http://eaci-projects.eu/iee/page/Page.jsp?op=project_detail&prid=1610

- **TRAINREBUILD:**

This is a recently concluded IEE project with the objective to design a comprehensive value chain strategy to generate change in thinking of public and private building owners regarding the link between energy efficiency and value related to building ownership. There were two core groups targeted by the project:

1. Staff of national associations of property owners and individual property owners
2. Officials from local authorities responsible for the retrofit of buildings in some Covenant of Mayors (CoM) cities.

The project did not focus on architects and engineers, as in the SouthZEB approach, but the toolkits developed for the authorities can be used in this project as a starting point. Again the focus was not on nZEB.

<http://trainrebuild.eu/>

3.2 Learning objectives

Clear, precise objectives are a must for effective training, and should be used within the training program. The characteristics of good learning objectives include the following:

- Clear, precise action words (verbs) are used.
- The learner has no doubt about what action is required.
- Action is intended for the learner's benefit, not the trainer's or anyone else's.
- Performance can be measured, it is possible to tell clearly whether or not the objective has been achieved.
- Any other competent user can use them.

In order to achieve the learning objectives and for continual improvement of course material it is essential that they focus on what the learner is saying and not on what the training is doing and saying. The domains of learning also need to be taken into account. These comprise the following:

Knowledge – Learners need to know something

i.e. local architectural regulations

Skills – Learners need to be able to do or perform something

i.e. evaluation and calculation of thermal bridging

Attitude – Learners need to develop and exhibit a particular attitude towards something

i.e. trainees are likely to have somewhat fixed points of view that make them closed to new ways of thinking and behaving - Retrofitting toward nZEB.

Appendix 01 outlines a training plan template that can be used for each training course.

Before carrying out training, consideration needs to be given to the audience. In this case, the audience will mainly comprise building professionals such as engineers, architects and municipality employees, authorities and decision makers and property owners. For these types of audiences it is important to know their characteristics and it is also important to recognise the principles of adult learning before delivering training material.

Table 3.1 outlines learning principles should be taken into account when developing the training material, workshops and portal.

Learning principles	Implication for course design
<ul style="list-style-type: none"> ▪ The trainee is a partner with the instructor in the learning process 	<ul style="list-style-type: none"> ▪ Participants should actively influence the learning approach
<ul style="list-style-type: none"> ▪ Trainees are capable of taking responsibility for their own learning 	<ul style="list-style-type: none"> ▪ Incorporate self-directed learning activities in the module design
<ul style="list-style-type: none"> ▪ Trainee learners gain through two-way communication 	<ul style="list-style-type: none"> ▪ Avoid over-use of lectures and “talking to”, emphasis discussion
<ul style="list-style-type: none"> ▪ Trainees learn through reflection on their and others’ experience. 	<ul style="list-style-type: none"> ▪ Use inter-active methods such as case studies, role-playing, and so forth.
<ul style="list-style-type: none"> ▪ Trainees learn what they perceive to be useful in their life situations. 	<ul style="list-style-type: none"> ▪ Make the content and materials closely fit assessed needs.
<ul style="list-style-type: none"> ▪ Trainees’ attention spans are a function of their interest in the experience. 	<ul style="list-style-type: none"> ▪ Allow plenty of time to “process” the learning activities.
<ul style="list-style-type: none"> ▪ Trainees are most receptive to instruction that is clearly related to problems they face daily. 	<ul style="list-style-type: none"> ▪ Promote giving inquiry into problems and affirm the experience of participants.
<ul style="list-style-type: none"> ▪ Trainees do not typically see themselves as learners 	<ul style="list-style-type: none"> ▪ Give participants a rationale for becoming involved and provide opportunities for success.
<ul style="list-style-type: none"> ▪ Trainees learn better in a climate that is informal and personal 	<ul style="list-style-type: none"> ▪ Promote getting acquainted and interpersonal linkages.
<ul style="list-style-type: none"> ▪ Trainee learners apply learning that they been influential in planning. 	<ul style="list-style-type: none"> ▪ Diagnose and prioritise learning needs and preferences during the course as well as before.
<ul style="list-style-type: none"> ▪ Trainees learn when they feel supported in experimenting with new ideas and skills. 	<ul style="list-style-type: none"> ▪ Use learning groups as home bases for participants.

<ul style="list-style-type: none"> ▪ Trainees are likely to have somewhat fixed points of view that make them closed to new ways of thinking and behaving. 	<ul style="list-style-type: none"> ▪ Include interpersonal feedback exercises and opportunities to experiment.
<ul style="list-style-type: none"> ▪ Trainees learn to react to differential status of members of the group. 	<ul style="list-style-type: none"> ▪ Use subgroups to provide safety and readiness to engage in open interchange.
<ul style="list-style-type: none"> ▪ Trainees are internally motivated to develop increased effectiveness. 	<ul style="list-style-type: none"> ▪ Make al learner evaluation self-directed.
<ul style="list-style-type: none"> ▪ Trainees filter their learning through their value systems. 	<ul style="list-style-type: none"> ▪ Provide activities that focus on cognitive, affective and behavioural change.

Table 3.1: Interaction between learning principles and course design

3.3 Training needs and content

Training needs have been specified for the targeted professionals, with the aim to produce eight training modules for Architects, Engineers and Municipality Employees in the South EU countries, two training modules for construction management and field supervision of nZEB as well as for training the decision makers in the preparation of appropriate funding schemes and other incentives for promoting nZEB.

The training modules comprise the following:

Basic module

The basic module will present the South nZEB concept and the principles of a near zero energy construction: applied physics basics, thermal insulation, materials and construction. Furthermore, the basic module will present the requirement for the minimum percentage of renewable energy sources of nearly Zero-Energy Buildings (nZEB), according to existing EU definitions, standards and roadmaps (such as the Energy Performance of Buildings Directive-EPBD). Active renewable energy supply systems will be presented such as solar systems, PV systems, heat pumps solutions, biomass solutions, pellet boilers etc. It will be divided in sub-modules, according to the abovementioned categories.

Advanced module

The advanced module will elaborate further on various arguments of nZEB design and building, including technical physics with respect to humidity, building materials, construction techniques, measurement techniques, installation and maintenance, ventilation and use of renewable energy sources. The passive use of renewable energy, e.g. passive solar gains, will be presented. The module will include a practical workshop for the trainees. This practical workshop will provide hands on experience to the trainees on how to use renewable energy sources in the nZEB design and building.

Thermal bridging module development

This module will focus on the evaluation and calculation of thermal bridges, through practical exercises. It will include sub-modules on the definition of thermal bridges, thermal losses through bridging, isothermal curves, surface temperatures, humidity, active directives and regulations. Calculation of surface

temperature and the linear thermal bridging of various points will be included. The module will include a practical workshop for the trainees.

Thermal Comfort

This module is focused on the thermal environment of buildings. It will define thermal comfort for a human body and how to model it. It explains factors and values that form the perception of thermal comfort. A significant part of the module is devoted to different ways of thermal comfort assessment according to valid standards. It gives optimal value ranges for thermal comfort depending on the level (category) of the requirements of the space. It considers also the users' expectations, adaptation and adaptive models of thermal comfort on resultant acceptable range of temperatures, its role in applicable standards and its effect on energy performance.

SouthZEB framework module and local architectural regulations

This module will aim at presenting to architects, engineers and municipality employees the SouthZEB approach for the verification and certification of nZEB in the target countries. Emphasis will be given on the special provision that SouthZEB has for building traditions and local architectural regulations as well as the user acceptance of technical solutions to nZEB. This module will be based on different training material for each target country, following though the common framework and directions.

nZEB simulation and design software module

This module will present to the participants the best simulation tools for the design of nZEB and energy efficient buildings. Engineering design tools for nZEB will also be presented by the partners from the front runner countries and especially BRE and DTTN. The module will include a practical workshop for the trainees.

Building energy simulation tools provide the ability to consider energy efficiency measures in buildings by predicting their behaviour under given climatic conditions and usage patterns. These tools help to predict building energy consumption and give the opportunity to compare different design options.

Decisions on the use of envelope insulation, advanced glazing, natural ventilation, passive solutions, high performance HVAC systems among many others can be taken with high confidence level. Energy conservation measures and concepts are important in economic terms for nZEB, as it reduces energy use without installing additional energy production systems. In order to identify the most effective conservation strategies, energy simulation tools are critical to identify and analyse the most efficient solutions.

By combining annual energy simulations with a life-cycle cost analysis, it is possible to answer design questions such as "is it cheaper to replace the lighting system than to add more PV?" or "Is this passive solution more cost effective than additional insulation?"

Low carbon technology and automation for nZEB

This module will train architects and engineers in learning the technologies of the various sub-systems and installations as well as their cost and effectiveness. As in all modules, emphasis is paid to the technologies most suitable for the target countries. The module will include building automation and its contribution to the integration and support of low carbon technology and nZEBs. Design and dimensioning issues will also be addressed. Additionally, the financial performance of the energy efficiency measures on nearly zero-energy buildings will be presented. These costs will include installation, maintenance and operating costs

as well as earnings from energy produced and disposal costs (if applicable). The global cost calculation method, which is described in EN 15459: Energy performance of buildings – economic evaluation procedure for energy systems in buildings, will also be presented to the trainees.

Retrofitting towards nZEB” training module

The aim of this training module will be to educate all interested parties in the way to address the existing building stock and its possibilities for transformation into nZEB. Assessment and energy audit techniques in existing buildings are also part of the training goals as well as the cost optimality of nZEB retrofit technical solutions.

Development of the training module for construction management and field supervision of nZEB

The aim of the training module will be to train the participants in construction management and field supervision according to the latest construction standards for nZEB. A Greek company with significant expertise in the area of sustainable building construction management and energy will also be subcontracted by UPATRAS to assist in the development of this module. Techniques will also be transferred from the participating front runners and especially BME.

Development of the training module for decision makers - Preparation of funding schemes and other incentives for nZEB

This training module is aimed at local and national authorities’ representatives that will participate in the corresponding sessions. It will include policy and legislation issues, financing energy efficiency retrofitting issues, citizens’ engagement issues and nZEB successful practices issues. The associated partners will be engaged in the development of this module. The aim is to make sure that the decision makers that will follow the course will be able to design new funding/promotion schemes for nZEB for the South European participating countries (EL, CY, PT, IT).

3.3.1 Key requirements

The following guidance should be used by those developing the training modules:

- Development of training module plans should be undertaken setting out the key components involved in each module. The plan should clearly set out learning outcomes, level that the training takes individuals to and a delivery plan.
- Each of the training modules contains an estimate of the total number of hours that might be involved (the term used here is ‘duration’ of the training). The duration stated is indicative and may differ to a certain extent after completion of the training module development phase. The total duration is an estimate of the amount of time that a trainee will require to complete the course and prepare for the assessment or exam. The total time stated does not translate directly into the time spent in the classroom. Typically the duration will be composed of three components, preparation hours, classroom hours and self-learning period. For example, a 30 hour module may be composed of 3 hours preparation, 15 hours classroom teaching and 12 hours (post classroom) self-learning and exam preparation. Note that this is an example only, the mix may change.
- Train the trainers (work package 5.1): there is an expectation that 150 trainers will be trained in total in the countries (Cyprus, Greece, Italy (south) and Portugal). As stated in WP5 this will involve ten days of classroom activity. Trainers will therefore be required to undertake further development

and preparation away from the classroom environment. They will be assessed for preparedness through successful completion of the exam (a high standard for successful candidate trainers will be set, see Report on WP6.1) and by monitoring their delivery, receiving feedback on courses and by self-critical analysis. Trainers will be able to demonstrate competence in the area of energy performance of buildings and other aspects of energy use prior to attending the training sessions. This may be through prior learning and also work based experience. Candidates should have at least 5 years post-graduation experience in a suitable environment.

- Train the trainees (work package 5.2): At least four training module completions will be required in order to achieve a qualification. Modules 1 and 2 are compulsory, plus another two modules that will be selected based on training needs. All ten modules can be completed by trainees, with recognition being given to such achievements in the certification.
- Involvement of front runner countries: it is expected (Work Package 5) that front runner countries will be involved in the train the trainer sessions. However, in the negotiation period the travel resource for this activity was removed by EASME. The partners from the UK, Austria and Italy (north) will therefore undertake the following to assist with the delivery of the initial trainer courses:
 - UK – to visit Portugal and assist in the delivery of two courses.
 - Austria – to visit both Greece and Cyprus and assist in the delivery of courses.
 - North Italy – to visit south Italy and assist in the delivery of courses.

3.4 Evaluation of training modules

It is necessary to review and sign-off on the quality of the training materials. This evaluation will be undertaken ultimately by the Expert Advisory Board, but initially be peer review.

The intention is therefore to have internal and external review of the developing training modules. The following framework will be used:

- Assessment of training module plan by work package leader and one other partner, with feedback to the module developer to make improvements as required.
- Assessment of training modules to be undertaken by two partners internally. Feedback form to be developed by WP leader to allow comment on the course materials, further reading and worked examples and other exercises.
- Revision of the training modules by the responsible partner, combined with a pilot delivery to a group of 'future trainers'. Feedback to be collected from the trainers on the course with revisions to be made as appropriate.
- Updated version to be forwarded to WP leader for final comment and to involve the Expert Advisory Board. Two members of the board will be asked to comment on each module and feedback will be obtained in a structured manner.
- Responsible partners will then make any necessary changes.

The role of the Expert Advisory Board is to provide an independent expert review of the training and ensure that the quality of the material is accurate and meets the training requirements and objectives.

4 Development

Developing training involves writing material, creating learning exercises and working together with partner experts. This is likely to be one of the most time consuming parts of the project and the draft material may go through a number of versions following guidance from the other partners and the Expert Advisory Board, before they are ready for training use.

As progress is made through this development phase, the parties need to make sure the training materials and exercise match the learning outcomes identified in the design phase, which are based on the needs of the assessment.

The above-mentioned training needs (section3.3) require repeated steps for each learning event, similar to those outlined in figure 2, but addresses smaller pieces of the learning. The learning event may be a module, lesson or single activity and must include the following actions:

- What is the purpose (learning goals) of the training?
- Write objectives (See training plan template – Appendix1.0)
- Write “learners have to” on Post-it notes.
- Sequence Post-it notes using an appropriate scheme
- Match methods to objectives
- Transfer to training plan (See training plan template – Appendix 1.0)

As a number of ‘train the trainer’ workshops will be run, a training plan is a helpful tool to provide trainers with as they can use this as a starting point when they go on to deliver the training. Below are characteristics that make a training plan useful to the trainer of the trainers and also the subsequent trainers. In addition, it is a useful tool for another qualified/certified SouthZEB trainer who might be needed to co-deliver a training session or be called on to fill in when the usual trainer is absent. A complete training plan includes the following steps:

- Clearly outlines the order and sequence of events;
- Provides and explains strategies for difficult areas of the lesson;
- Is type-written;
- Includes training objectives and overall training goals;
- Describes when and how training packet contents are used;
- Lists training equipment needed for the lesson;
- Provides transitions between different parts of the lesson;

- Lists likely answers that come up for questions posed in the training plan;
- Gives discussion-generating questions to be suggested to group as needed.

When developing the training content/material ensure that the objective/training needs set in the assessment section have been met. Once you decide what to include ask the following for each part:

- Is this essential to meet my objective?
- Does the learner need certain foundation (i.e. Knowledge; skills; attitude) to learn this part (see pre-requisites below)?
- How can I make this as relevant (adult learning principles above) as possible?
- What will make this understandable - illustrations, personal stories, video demos etc.
- How should the chunks of learning material be sequenced so that the learner can follow and make sense of it?

If it is necessary to the module and dependent on the knowledge, skills and attitudes of the audience, it may be necessary to teach prerequisites or lay the ground rules, as follows:

- Teach most important and frequently used concepts/tasks first;
- Teach the general, then the specific;
- Teach rules before exceptions;
- Progress from the simple to the complex;
- Teach similar and potentially confusing concepts/tasks together, emphasizing the aspects that make them different;
- Teach small portions of a long set of procedures at a time; provide many practice opportunities;
- Teach tasks and procedures in the sequence in which they occur on the job.

In addition to developing the content required for teaching, learner materials will also be required. These can include items such as, power-point slides; hand-outs, flip-charts, poster, demo videos and hand-outs/booklets. The material must be legible and the content must be appropriate to the target country.

The reading level should be appropriate to the audience and a number of general considerations should be followed. The following outlines a few things to be considered when designing and developing learning materials:

Proper grammar and spelling should be observed;

- Use correct and consistent margins throughout documents;
- The first time you use an acronym, spell out the entire title and then put the acronym in brackets after the title;

- Do not use abbreviations or shorthand for standard text in the document (i.e. bkgd for background etc.);
- When using a screen print to illustrate a function or point, ensure that corresponding text is included after the image. The same applies to all images used. It is easier to relate the text with the image if you have seen the image before the text;
- Have images and text together on the same pages/slide when possible.

It is important to present the training material in the same style throughout to ensure the training material looks consistent (e.g. for reports if the main headings are Arial 14 point font and the sub-headings are Arial 12 point font, then all main and sub-headings should follow suit.)

For power point presentation, a slide master should be developed and every slide presentation should be based on the master slide. The master slide will determine, for example which font appears on each slide and how it is to be formatted.

5 Implementation

The implementation step includes all the steps necessary to “get the training out there”; this includes, doing a pilot run, revising material as necessary, scheduling location and trainers, arranging for any equipment and transportation, conducting the training, considering evaluations and making adjustments for the next training sessions. This is also the stage where you ensure the information pack, equipment; supplies, video items etc. are in place.

The previous steps of the training process focus heavily on creating the content of the training, the delivery and implementation phase is concerned with teaching the content and participant learning.

5.1 Training methodology

All training modules will be delivered through blended learning which will include a combination of the following:

- Instructor-led, classroom-based learning

The trainers, trained in the “train the trainer workshops” will transfer their knowledge to the professionals. These training sections will be offered free of charge for the participants, since they are considered a pilot training, monitoring also by the experts from BRE, DTTN and BEST. The consortium will follow closely these training sessions and ensure transnational cooperation. Participants will be asked to register through partners’ online system and they will have to select which modules they wish to follow. The classroom-based learning will include both theoretical classes and workshops that will be open to interested professional.

- E-learning

An e-learning platform for remote training using the developed modules will be developed. The pilot training sessions will also be available for distance learning, through the e-learning platform, with the exception of the practical workshops. Assessment exams will not be remotely available.

In addition to the above, a virtual forum will be developed to bring together building professionals, authorities, certification bodies, vocational trainers and researchers from across Europe. The forum will enable users to interact with each other through avatars. In the forum, users can meet, exchange experiences, and participate in group activities. The forum will be open for researchers that wish to promote their results.

5.2 Learning styles

People have different learning styles and table 5.1 outlines some guidance on the techniques that appeal to different learning styles; therefore it is important include some elements of all three if possible in the delivery of training courses.

Visual (Seeing)	Auditory (Hearing)	Tactile (Doing)
<ul style="list-style-type: none"> • Provide Visual aids (i.e., pictures, charts, graphs, maps, flowcharts, diagrams, timetables etc.) • Use multimedia (i.e. computer, power-point, mind-maps) • Use colour to highlight important points in the text • Ask them to preview chapters by looking at subheadings and illustrations before reading the text • Illustrate your ideas as a picture or brainstorming bubble before writing them down 	<ul style="list-style-type: none"> • Encourage class discussions, debates, speeches or teach-backs • Provide an opportunity for them to recite the main points of a hand-out or lecture • Allow them to read information out loud • Use analogies and storytelling to demonstrate your point. • Use case studies and readings 	<ul style="list-style-type: none"> • Provide frequent breaks during lecture • Incorporate hand-on activities that allow hand-on experience (if possible/relevant) • Ask them to take notes and encourage them to underline key points as they read. • Problem Solving Activities • Case studies and project assignments

Table 5.1: Techniques for different learning styles

5.3 Presenting training

Presentation is much more than just giving the audience the content. To be a competent presenter, the trainer must be able to: facilitate, question, give feedback, conduct learner-centred activities, manage the classroom and evaluate learner retention and transfer of knowledge/skills/attitude.

When presenting, there are a number of elements which should be included, as follows:

- Opening
 - Introduce yourself and participants
 - Set the context by giving the reason for the training
 - Tell what the objectives are
 - Do a warm-up exercise to help learners feel comfortable talking to each other.
- For each training segment
 - Introduce the topic and outline what makes it relevant
 - Show and tell

- Have learners apply the content and practice if appropriate
- Clarify by answering questions, giving feedback, discussing results
- Evaluate success through questions, test or learner self-assessment
- Review
- Closing
 - Give an overall summary to recall and reinforce the learning experience
 - Do any final testing or evaluation
 - Ask learners to set a goal with a time frame of how they will apply the learning.

Appendix 3 outlines an example of a delivery plan checklist which can be used by the trainers to help to ensure the delivery runs as smooth as possible.

5.4 Effective communication

Good communication skills are essential when training trainees. The following outlines generic effective communication guidelines that should run through the whole training course and are not limited to one type of training or the other. There are three things a facilitator can do to help create an effective learning atmosphere for the course participants.

Support the group of participants by building an atmosphere of trust and modelling a positive attitude.

One of the most important things a facilitator can do is to build an atmosphere of trust. An accepting and non-threatening atmosphere encourages the expression of ideas, questions, beliefs and attitudes by all participants. The following outlines a number of ways to build trust among the group:

- Assure that confidentiality will be maintained. Establish a group rule on the first day that everyone's confidentiality must and will be protected so that people can talk freely without fear that their comments will be shared outside the course.
- Provide constructive and supportive feedback. Let participants know when they've contributed something useful and interesting to the group. For example, you might say, "That's a very good example of the concept we are discussing."
- Model a positive attitude, participants will probably get tired as the course progresses and need some encouragement.
- **Ensure that the entire course content is covered.**

It is important to stay on schedule and help participants see how each session flows logically from the one before, as follows:

- If participants deviate from the topic, offer to address their comments during a break.

- Write additional topics identified by participants on flip chart paper as a reminder of topics to cover if there is time remaining at the end of the session. Keep this list visible to participants throughout the workshop.
- Each session's training plan includes key summary points. Referring to these key points, and reviewing them at the end of a session, will help you know if you have covered all of the main content of your training plan.

Model effective facilitation skills

Trainer should remember the basic facilitation strategies throughout the course, as follows:

- Ask open-ended questions.
- Listen carefully to the communication and for any feelings that may accompany it.
- Rephrase participants' communications accurately for clarity, when necessary, and without judgment.
- Respect every participant's feelings, perspectives, and contributions.
- Adhere to the time schedule.
- Focus on developing skills, not just knowledge.
- Make the learning process active.
- Make the course material clear by speaking slowly and using language that is understood by all participants.

6 Evaluation

Evaluation should be a continual procedure throughout each step and when creating the training modules use the following points as a guide:

- How can you evaluate whether learners are succeeding in the training tasks?
- How successful was the training event?
- How well did the entire course/program achieve the desired training goals?

Training evaluation should take place throughout each phase of the training process, not as a last step. The previous IEE training courses will need to be evaluated to identify baseline material and a starting point for the modules. Once the training material is developed, this will require evaluation from the Expert Advisory Board to ensure its accuracy and confirm its meeting its requirements before finalising for training.

The most obvious and frequent kind of evaluation occurs immediately after training; participants complete a course evaluation form following the training. Appendix 2.0 outlines an example of a course evaluation form.

An evaluation of the project results will ensure that the project meets its objectives, the deliverables are of an acceptable quality and the project outcomes meet the Executive Agency for Small and Medium sized Enterprises (EASME) requirements. Recommendations will be made to improve the quality wherever necessary. The educational aspect of the project will also be evaluated. Especially for the developed portal, apart from internal usability tests, a multi-level evaluation will be made, taking into account both the perceived ease of use and perceived usefulness of the developed system. To this end, a set of indicators and instruments to gather data (questionnaires, interviews, feedback forms, observation protocols, etc.) will be designed and developed. Besides, the evaluation methodology considers the various categories of the system users: workshop participants who use the environment as end-users, workshop conductors, workshop organizers and professionals that did not attend the workshops. The Expert Advisory Board (EAB) will also prepare a report to evaluate the project outcomes from an external point of view.

An evaluation will also take place of the workshops which will cover the workshop packages and the enactment of the learning design. Thus, the indicators will encompass the following:

- The quality of the event(s) organisation;
- The acceptance and perceived usefulness of the proposed activities;
- The adequacy of the time schedule etc.; with respect to learning design enactment.

Indicators will also include the perception of the effects of the learning design. To this end, questionnaires, feedback forms and interviews will be collected.

Evaluation of the project impact using appropriate indicators will also be continuously assessed. Special emphasis is paid to the evaluation of the project, using the IEE Common Performance Indicators. The effect that the training has will be assessed in terms of certified trainers and professionals. The environmental impact will be measured in terms of nZEB designed/developed in the target countries by SouthZEB certified professionals.

7 Portal development and implementation

The approach to the development and implementation of the portal should follow the same 'ADDIE' approach as set out above. The previous sections have been written mainly for the workshops, training and assessment activities, but can equally be applied to the portal.

The on-line portal should be developed using the ADDIE approach, but also allow easy access for trainers and trainees alike. The format should be kept simple to allow ready navigation from one page to another. The key pages on the portal are likely to include the following:

- Main page and introduction
- Detailed description of the training, assessments and the nZEB qualification
- Documentation – application form(s) [on line], guidance documents, nZEB scheme document, etc
- E-learning On line training materials to support class based learning – available to trainees who have signed up
- nZEB simulation and design tools
- Forum of building professionals, etc
- Qualifications description
- Background information and links
- Funding opportunities – for training in nZEB
- Complaints and appeals procedures.

For the portal development BEST should create a focus group in order to assess the user acceptance. This focus group could contain the members of the Expert Advisory Board, trainers and potential trainees. The group would be run virtually and effectively create a pilot run of the training.

As for the training workshops a development plan, course plan and delivery plan should be prepared. The aspect of continuous improvement should be included, in order to allow flexibility for updating in the future.

Appendix 1.0: Template training plan

SUBJECT:		LESSON TITLE:	
LENGTH OF CLASS:	PREPARED BY:		DATE:
LEARNER OBJECTIVES:			
LESSON REFERENCES:			
INSTRUCTIONAL AIDS: (Equipment; Supplies; Printed Material)			
TYPE OF PRESENTATION:		SPACE REQUIRED:	
SPECIAL CONSIDERATIONS:			

LESSON PLAN OUTLINE:	
LESSON PLAN	KEY POINTS AND CLUES:

Appendix 2.0: Course Evaluation

Name (optional):		Date:				
Course Name:		Facilitator(s);				
Rating Scale: 1 = Poor.....3 = Average.....5 = Excellent						
1. How would you rate your knowledge of this subject prior to the training?	1	2	3	4	5	
2. How would you rate your knowledge of this subject after the training?	1	2	3	4	5	
3. How would you rate the value of the information to your job?	1	2	3	4	5	
4. How would you rate the facilitator's knowledge and understanding of the topic?	1	2	3	4	5	
5. How well did this course meet the objectives?	1	2	3	4	5	
6. How would you rate the overall presentation?	1	2	3	4	5	
7. How would you rate the visuals and handouts?	1	2	3	4	5	
8. How well was the information provided in the time allowed?	1	2	3	4	5	
9. How well did this session cover what you expected?	1	2	3	4	5	
10. Do you feel you were treated correctly when asking questions?	1	2	3	4	5	
11. Would you recommend this session to others?	1	2	3	4	5	
12. What worked well?						
13. What could we do differently in the future?						
14. Other comments?						
Thank you for taking the time to complete this evaluation. Your feedback is encouraged and appreciated. It will be used to make improvements to our courses.						

Appendix3.0: Delivery Plan Checklist

Use this checklist as an aid to check the completeness of your delivery plan			
Task	Yes	No	N/A*
• Are your introductory remarks to orient the trainees to the subject in general included?			
• Are housekeeping remarks included?			
• Is there an introductory activity that involves the trainees (e.g., trainee inductions)?			
• Have you included the main points and activities for each section?			
• Have you included the instructions for your training activities?			
• Have you included specific questions or comments at the points where you wish to make them?			
• Are summary and transition comments included between sections?			
• Are training aids referenced at the point where you will use them?			
• Have you included an overall summary and your closing remarks?			
• Is the time allotted for each major section?			
• Do the allotted times add up to the total time available?			
• Have you included a training evaluation?			
*Not Applicable			