SouthZEB WP3-Task1: Deliverable D3.1: SouthZEB Framework

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Glossary of Terms

Certification body A body issuing certificates of compliance against a given standard, in this case SouthZEB.

nZEB near Zero Energy Building

Applicant: The applicant for a membership of the SouthZEB scheme.

Certificate: A certificate of membership for SouthZEB trainers and members.

Continuing Professional Development The process of tracking and documenting the skills, knowledge and experience gained both formally and informally as you work, beyond any initial training.

Register: The register of nZEB members, set out by level and country.

Scheme: The SouthZEB training based Scheme for practitioners in near zero energy buildings.

Scheme Provider: The organisation that operates the SouthZEB certification scheme.

Sole practitioner: A practice that has no employees other that the principle professional and who is not an employee of any other type of firm.

Contents

1 Introduction

The recast Directive on the energy performance of building (EPBD) stipulates that all new buildings constructed within the EU after 2020 should reach nearly zero energy level, and following 31st December 2018 new buildings occupied and owned by public authorities are nearly zero energy buildings. Technically, every architect should be able to design a near zero energy building (nZEB), however, in practice this requires ongoing awareness of technical standards and innovative practice. On-going training programmes can help overcome this potential barrier.

As such, the objective of the SouthZEB 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.

A total of ten training modules are being developed from the SouthZEB project. Ten assessment exams, one for each of the above training modules will be created.

The objectives of the project include the following:

- At least 150 trainers will be trained to deliver the modules
- At least 1,500 professionals (engineers, architects, municipality employees, decision makers) will be trained on nZEB
- At least 400 professionals trained remotely through the e-learning platform (part of the 1,500 stated above)
- At least 3,000 user registrations in the portal by the end of the project
- Four new funding and promotion schemes for nZEB designed, one in each of the South European participating countries (i.e. Greece, Cyprus, Portugal and south Italy).

1.1 Work Package 3 – Task 1 - Framework

The overall aim of this Work Package task is to define the training and certification framework for all target groups in the target countries.

2 Training and certification framework

2.1 Framework introduction

The SouthZEB training and certification framework provides an outline for the training of individuals in the design, construction and operation of near zero energy buildings. It focusses on the southern European countries of Cyprus, Greece, Italy and Portugal. This scheme will be operated in accordance with the requirements set out in this framework. The certification framework takes account of the wide range of building professionals and others (e.g. employees of local authorities and government departments) that are likely to be included within the SouthZEB certification.

The certification framework will be operated by the partners listed and scheme roles given in Annex 1. The scheme members will have the license to use the SouthZEB Mark and scheme logo for a defined period of time. The on-going membership will be the responsibility of the national partners (Annex 1) following the project period. The appropriate training and assessment for renewal will be determined by the SouthZEB partners after the certification scheme becomes self-sufficient (i.e. beyond the period of the SouthZEB project and is not covered in detail here).

Members will be required to have knowledge of the following:

- The training and approval process for SouthZEB members;
- Code of Conduct for the Scheme (note that the project partners have indicated that this is a necessary requirement of membership).

The certification process will be summarised in the joining information set out on the SouthZEB portal/website joining information page.

SouthZEB has been created on the basis of a signed agreement between the partners given in Annex 1. These partners will operate the training and certification framework, which will exist officially on the basis of a future collaboration agreement and business model.

Product certification or product qualification is the process of certifying that a certain product has passed performance tests and quality assurance tests, and meets qualification criteria stipulated in contracts, regulations, or specifications (typically called "certification schemes" in the product certification industry).

Most product certification bodies (or product certifiers) are accredited to ISO/IEC Guide 65:1996, an international standard for ensuring competence in those organizations performing product certifications. The organizations that perform this accreditation are called Accreditation Bodies, and they themselves are assessed by international peers against the ISO 17011 standard. Accreditation bodies that participate in the International Accreditation Forum (IAF) Multilateral Agreement (MLA) also ensure that these accredited Product Certifiers meet additional requirements set forth in "IAF GD5:2006 - IAF Guidance on the Application of ISO/IEC Guide 65:1996".

Examples of some certification schemes include the Safety Equipment Institute for protective headgear, the U.S. Federal Communications Commission (FCC) Telecommunication Certification Body (TCB) program for radio communication devices, the U.S. Environmental Protection Agency Energy Star program, the International Commission on the Rules for the Approval of Electrical Equipment Product Safety Certification Body Scheme (IEECE CB Scheme), MAS (Materials Analytical Services) Certified Green IEQ program, and the Greenguard Environmental Institute Indoor Air Quality program. Certification schemes are typically written to include both the performance test methods that the product must be tested to, as well as the criteria that the product must meet to become certified.

Professional certification, trade certification, or professional designation, often called simply certification or qualification, is a designation earned by a person to assure qualification to perform a job or task. Not all certifications that use post-nominal letters are an acknowledgement of educational achievement, or an agency appointed to safeguard the public interest.

There are three general types of certification. Listed in order of development level and portability, they are as follows:

- Corporate, or "internal" certifications, are made by a corporation or low-stakes organization for internal purposes. For example, a corporation might require a one-day training course for all sales personnel, after which they receive a certificate. While this certificate has limited portability – to other corporations, for example – it is the most simple to develop.
- Product-specific certifications are more involved, and are intended to be referenced to a product across all applications. This approach is very prevalent in the information technology (IT) industry, where personnel are certified on a version of software or hardware. This type of certification is portable across locations (for example, different corporations that use that software), but not across other products. Another example could be the certifications issued for shipping personnel, which are under international standards even for the recognition of the certification body, under the International Maritime Organization (IMO).
- The most general type of certification is profession-wide. Certification in the medical profession is often offered by particular specialties. In order to apply professional standards, increase the level of practice, and protect the public, a professional organization might establish a certification. This is intended to be portable to all places a certified professional might work. Of course, this generalization increases the cost of such a program; the process to establish a legally defensible assessment of an entire profession is very extensive. An example of this is a Certified Public Accountant (CPA), which would not be certified for just one corporation or one piece of accountancy software but for general work in the profession.

The SouthZEB Certification is akin to the second of these where a bespoke need for better trained and certified construction professionals with appropriate energy skills for near zero energy buildings is required.

2.2 Scope

The scope of this training and certification framework includes building and associated professionals in the countries of Cyprus, Greece, Italy and Portugal who have undertaken certain levels of training and satisfactorily completed the relevant course assessments. The framework refers to the development of a skills set related to near zero energy buildings. The framework has flexibility that allows trainees to gather

a minimum set of criteria for membership and to reinforce this with further training and assessments over time, as a result different levels of membership are anticipated.

The framework applies to the following:

- New build domestic buildings of any type being built to a near zero energy building standard.
- New build non-domestic buildings of any type built to a near zero energy building standard
    - A building or edifice is a structure with a roof and walls standing more or less permanently in one place, such as a house or factory. Buildings come in a variety of sizes, shapes and functions, and have been adapted throughout history for a wide number of factors, from building materials available, to weather conditions, to land prices, ground conditions, specific uses and aesthetic reasons. To better understand the term building compare the list of non-building structures. Buildings serve several needs of society; primarily as shelter from weather, security, living space, privacy, to store belongings, and to comfortably live and work. A building as a shelter represents a physical division of the human habitat (a place of comfort and safety) and the outside.
- Existing domestic buildings of any type undergoing a near zero energy refurbishment.
- Existing non-domestic buildings of any type undergoing a near zero energy refurbishment.
    - Existing buildings account for most of the energy used in the building sector, whereas new buildings use only a small percentage of energy. The energy use in commercial buildings is predicted to increase every year for at least two decades. Therefore, it is important to retrofit existing buildings to increase energy savings. This endeavour is complicated with many considerations, such as maintaining historic features to controlling costs. ilding owners are retrofitting buildings, converting them into archetypes of sustainability. While most building owners still follow individual technology improvements, smart owners package energy saving technologies to get serious savings through lower energy consumption and operating costs. Fundamentally, the improvements are paid for through energy savings over time. A building can often be retrofitted for a lower cost than a new building. To accomplish this it's important to review the heating and air conditioning system, as well as lighting. The goal should be to create a high-performance building that ensures all of the design concepts are met. By accomplishing the design objectives, the building will be less costly to operate, increase in value, last longer and contribute to a healthier and more productive environment for the workers.

The SouthZEB certification scheme is open to anyone who wishes to become a member of the SouthZEB scheme and who has appropriate qualifications and experience. Qualifications gained in other parts of Europe (i.e. not the four countries), and elsewhere, may be relevant to membership of this Scheme.

Members will include those drawn from the following:

- Architects and architectural technologists:
    - Architects work in the construction industry designing new buildings, restoring and conserving old buildings and developing new ways of using existing buildings. They are involved in construction projects from the earliest stages right through to completion.

- Architectural Technicians specialise in the application of technology in architecture. They are an integral supporting part of the design team specialising in the research of products, processes, legislation and technology as well as detailing, designs and drawings.

- Building engineers and scientists:
  - Building Engineer. Building engineers act in a similar capacity to construction managers, utilizing a mixture of construction knowledge and engineering principles. Building engineers analyse reports, help design structures, and manage contracts and budgets.
  - Building science is a field of knowledge that draws upon physics, chemistry, engineering, architecture, and the life sciences. Understanding the physical behaviour of the building as a system and how this impacts energy efficiency, durability, comfort and indoor air quality is essential to innovating high-performance buildings. Modern building science attempts to work with models of the building as a system, and to apply empirical techniques to the effective solution of design problems.

- Building services (electrical, mechanical):
  - Building services engineers advise about, design, install and maintain cost-effective and energy efficient systems for building services such as water, lighting, heating, air conditioning, lifts, and telecoms.

- Civil and structural engineers:
  - Civil engineers create, improve and protect the environment, they plan, design and oversee construction and maintenance of building structures and infrastructure, such as roads, railways, airports, bridges, harbours, dams, irrigation projects, power plants, and water and sewerage systems.
  - Structural engineers design, plan and oversee the construction of new buildings and bridges, or alterations and extensions to existing properties or other structures.

- Surveyors (building, quantity):
  - Building surveyors offer advice on many aspects of design and construction, including maintenance, repair, refurbishment and restoration of proposed and existing buildings. They offer quality assessments and report on defects in, or ways of improving, all kinds of buildings.
  - A quantity surveyor manages all costs relating to building and civil engineering projects, from the initial calculations to the final figures. They seek to minimise the costs of a project and enhance value for money, while still achieving the required standards and quality.

- Planners:
  - Spatial planners coordinate practices and policies affecting spatial organization. Spatial planning is synonymous with the practices of urban planning in the United States but at larger scales and the term is often used in reference to planning efforts in European countries. Discrete professional disciplines which involve spatial planning include land use, urban, regional, transport and environmental planning. Other related areas are also

important, including economic and community planning. Spatial planning takes place on local, regional, national and inter-national levels and often results in the creation of a spatial plan.

- Local authority and housing authority asset managers:
    - The Housing Manager is responsible for ensuring the maintenance and upkeep of all public social housing properties within the community.
- Facility and property managers:
    - A facilities manager is a job role that is responsible for making sure that buildings and their services meet the needs of the people that work in them. Facilities managers are accountable for services such as cleaning, security and parking, to make sure the surrounding environment is in a suitable condition to work.
- Construction finance and accountancy professionals:
    - An accountant prepares asset, liability, and capital account entries by compiling and analysing account information. Documents financial transactions by entering account information. Recommends financial actions by analysing accounting options.

Members should normally have a degree level qualification in the appropriate areas and regarding experience that depends on whether the member shall be a trainer or a trainee. In case of trainer, the minimum experience should be 2.5 years, whereas in case of trainee no minimum experience is required.

The European Qualifications Framework (EQF) acts as a translation device to make national qualifications more readable across Europe, promoting workers' and learners' mobility between countries and facilitating their lifelong learning.

Table 2.1 shows the levels involved in the framework and the associated knowledge, skills and competence required. Members of the SouthZEB certification framework would be expected to have achieved at least Level 3, with Level 4 being expected within a period of two years of joining the scheme.

Level	**Knowledge**	**Skills**	**Competence**
	In the context of EQF, knowledge is described as theoretical and/or factual.	*In the context of EQF, skills are described as* *cognitive (involving the use of logical, intuitive and creative thinking), and* *practical (involving manual dexterity and the use of methods, materials, tools and instruments)*	*In the context of EQF, competence is described in terms of responsibility and autonomy.*
Level 1	Basic general knowledge	Basic skills required to carry out simple tasks	Work or study under direct supervision in a structured context

Level	Knowledge	Skills	Competence
	In the context of EQF, knowledge is described as theoretical and/or factual.	*In the context of EQF, skills are described as* *cognitive (involving the use of logical, intuitive and creative thinking), and* *practical (involving manual dexterity and the use of methods, materials, tools and instruments)*	*In the context of EQF, competence is described in terms of responsibility and autonomy.*
Level 2	Basic factual knowledge of a field of work or study	Basic cognitive and practical skills required to use relevant information in order to carry out tasks and to solve routine problems using simple rules and tools	Work or study under supervision with some autonomy
Level 3	Knowledge of facts, principles, processes and general concepts, in a field of work or study	A range of cognitive and practical skills required to accomplish tasks and solve problems by selecting and applying basic methods, tools, materials and information	Take responsibility for completion of tasks in work or study; adapt own behaviour to circumstances in solving problems
Level 4	Factual and theoretical knowledge in broad contexts within a field of work or study	A range of cognitive and practical skills required to generate solutions to specific problems in a field of work or study	Exercise self-management within the guidelines of work or study contexts that are usually predictable, but are subject to change; supervise the routine work of others, taking some responsibility for the evaluation and improvement of work or study activities
Level 5[1]	Comprehensive, specialised, factual and theoretical knowledge within a field of work or study and an awareness of the boundaries of that knowledge	A comprehensive range of cognitive and practical skills required to develop creative solutions to abstract problems	Exercise management and supervision in contexts of work or study activities where there is unpredictable change; review and develop performance of self and others
Level 6[2]	Advanced knowledge of a field of work or study, involving a critical understanding of theories and principles	Advanced skills, demonstrating mastery and innovation, required to solve complex and unpredictable problems in a specialised field of work or study	Manage complex technical or professional activities or projects, taking responsibility for decision-making in unpredictable work or study contexts; take responsibility for managing professional development of individuals and groups

Level	Knowledge	Skills	Competence
	In the context of EQF, knowledge is described as theoretical and/or factual.	*In the context of EQF, skills are described as* *cognitive (involving the use of logical, intuitive and creative thinking), and* *practical (involving manual dexterity and the use of methods, materials, tools and instruments)*	*In the context of EQF, competence is described in terms of responsibility and autonomy.*
Level 7[3]	Highly specialised knowledge, some of which is at the forefront of knowledge in a field of work or study, as the basis for original thinking and/or research Critical awareness of knowledge issues in a field and at the interface between different fields	Specialised problem-solving skills required in research and/or innovation in order to develop new knowledge and procedures and to integrate knowledge from different fields	Manage and transform work or study contexts that are complex, unpredictable and require new strategic approaches; take responsibility for contributing to professional knowledge and practice and/or for reviewing the strategic performance of teams
Level 8[4]	Knowledge at the most advanced frontier of a field of work or study and at the interface between fields	The most advanced and specialised skills and techniques, including synthesis and evaluation, required to solve critical problems in research and/or innovation and to extend and redefine existing knowledge or professional practice	Demonstrate substantial authority, innovation, autonomy, scholarly and professional integrity and sustained commitment to the development of new ideas or processes at the forefront of work or study contexts including research

Table 2.1: Compatibility with the Framework for Qualifications of the European Higher Education Area

2.3 Applications to join the Scheme

To apply to join the certification scheme candidates should complete the application form and accept the Code of Conduct on the SouthZEB portal. For the period of the SouthZEB project this will be undertaken as a self-check requiring the candidate to ensure that the minimum number of data fields in the application form have been satisfactorily completed.

The minimum requirements to join the scheme are as follows:

- Appropriate academic degree in order to adequately address aspects regarding the design and construction of buildings, and as set out above (preferred Level 4 EQF, Level 3 can be allowed where the candidate is working towards Level 4).

- Relevant occupational license
- In case of trainers it is expected to have minimum 2.5 years of relevant experience, whereas in case of trainees no experience is required.

It should also be stated that the aforementioned criteria will be coherent among the target countries, however also partially country-based in order to accommodate the specialties of each country. The applicant will then undertake the training required. The applicant will then undertake the assessment process (i.e. on-line tests). Provided that all details required in the application are satisfactory and payments have been received, a letter is sent out to the applicant accepting them into the SouthZEB scheme. Any fee charged will be 'small' or nominal in accordance with the Description of Work of the SouthZEB project and will be taken when the application is made. The applicants' details will then be put onto the Scheme Register.

For more information or help with application candidates should contact the National Partner, relevant details will be on the SouthZEB portal. The National Partners shall be responsible for the overall process of application in the relevant country.

2.4 Assessment

The assessment of an applicant's suitability to join the scheme will be based on satisfactory submission of information and matched against the requirements above. The initial assessment (on-line tests) will be undertaken through the portal, if data is not entered then the candidate cannot be accepted onto the training and certification scheme. Further additional information may be requested from applicants as appropriate.

The criteria set for qualifications for registration is that any award achieves the following:

- incorporates assessment of competence based on a set of training modules.
- is designed to match the professional needs of near zero energy building planning, design, construction and maintenance.
- is subject to regulated external verification or assessment.

2.5 Certification and listing

SouthZEB Certificates are awarded to applicants who meet all of the criteria detailed in the Scheme Document, who undertake to comply with all relevant scheme requirements and abide by the Code of Conduct.

SouthZEB Certificates contain the name and address of the applicant, a description of the scheme, a unique certificate reference number and the issue number, date and courses attended.

SouthZEB Certificates are valid from the date of issue and are maintained and held in force subject to on-going compliance with the requirements for maintenance of certification (see item 2.6), but remain the property of the partners (see Annex 1).

Details of the successful applicants are held on the SouthZEB Scheme Register. The register will be available to be viewed by members of the public through the public part of the SouthZEB portal. The listing

will contain the name, affiliation, unique member number, country of business and contact details for the member. The listing will be maintained for the period of the SouthZEB project.

(Note that further maintenance of the scheme beyond the project period may be undertaken by partners under a collaboration agreement).

2.6 Maintenance of Certification

Certification is maintained and held in force through activities which are described for trainers and members later in this document. Incorrect use of certification will result in suspension and potentially withdrawal of certification.

Every member who achieves certification is required to continue their development through further training and assessment, as well as undertaking CPD activity. Members require to pass the assessment of four modules prior to achieving certification. However, they may continue to add further qualification, which is to be encouraged.

2.7 Certification Mark

The certificate holder may use the SouthZEB Mark as directed in the portal.

A certification mark indicates the existence of an accepted standard and a claim that the holder has complied with the relevant standards and scheme requirements. The specific specification, training module description, and frequency of renewal are published by the SouthZEB scheme operator. Certification listing does not necessarily guarantee fitness for purpose, but gives clients evidence of such.

Certification marks differ from collective trademarks. The main difference is that collective trademarks may be used by particular members of the organization which owns them, while certification marks are the only evidence of the existence of follow-up agreements between manufacturers and nationally accredited testing and certification organisations. SouthZEB charges for the use of the label.

Certification is often mistakenly referred to as an "approval", which is often not true. SouthZEB does not approve anything except the use of the mark to show that a product has been certified. The SouthZEB Certification marks can be owned by independent individuals and companies.

2.8 Complaints and appeals

SouthZEB operates procedures for complaints and appeals for applicants and members. Further details will be available on the portal.

2.9 Change of details

The certificate holder shall give notice in writing to SouthZEB of a change in legal constitution, trading or title, address, changes to the named individuals on the certificate, or other significant particulars and declarations upon which the current certificate was granted. Such notice shall be given to SouthZEB within thirty days of any change becoming effective.

Where the changes are such that the conditions under which certification was granted are significantly affected, the certificate holder will be advised of the actions, and any associated fees, that will be required to be completed to maintain certification.

2.10 The certification process

The certification process is set out in figure 2.1.

2.11 Additional recommendations

The following additional requirements are made:

- The certificate holder or their employer will preferably have professional indemnity and public liability insurance. Note that allowance will be made for national requirements on the use of insurances; which will be determined by the National Partners.
- Certificate holders are required to keep the Certification Scheme database up to date with regard to any complaints received and any actions taken to resolve them. The responsibility will be for the member to supply information to the National Partner, who will maintain the information on the database, noting the actions taken to resolve the complaint. The information will not be made publicly available, but will instead be used in order to determine suitability for on-going membership and any further training or assessment required. The National Partner will be responsible for determining any disciplinary actions against a member, assisted by another two technical partners.

2.11.1 Continual course content revision

Revisions to training content, or to outcomes, are expected throughout the life of the SouthZEB training programme. In order to manage change appropriately, the following steps will be undertaken whenever course content is altered:

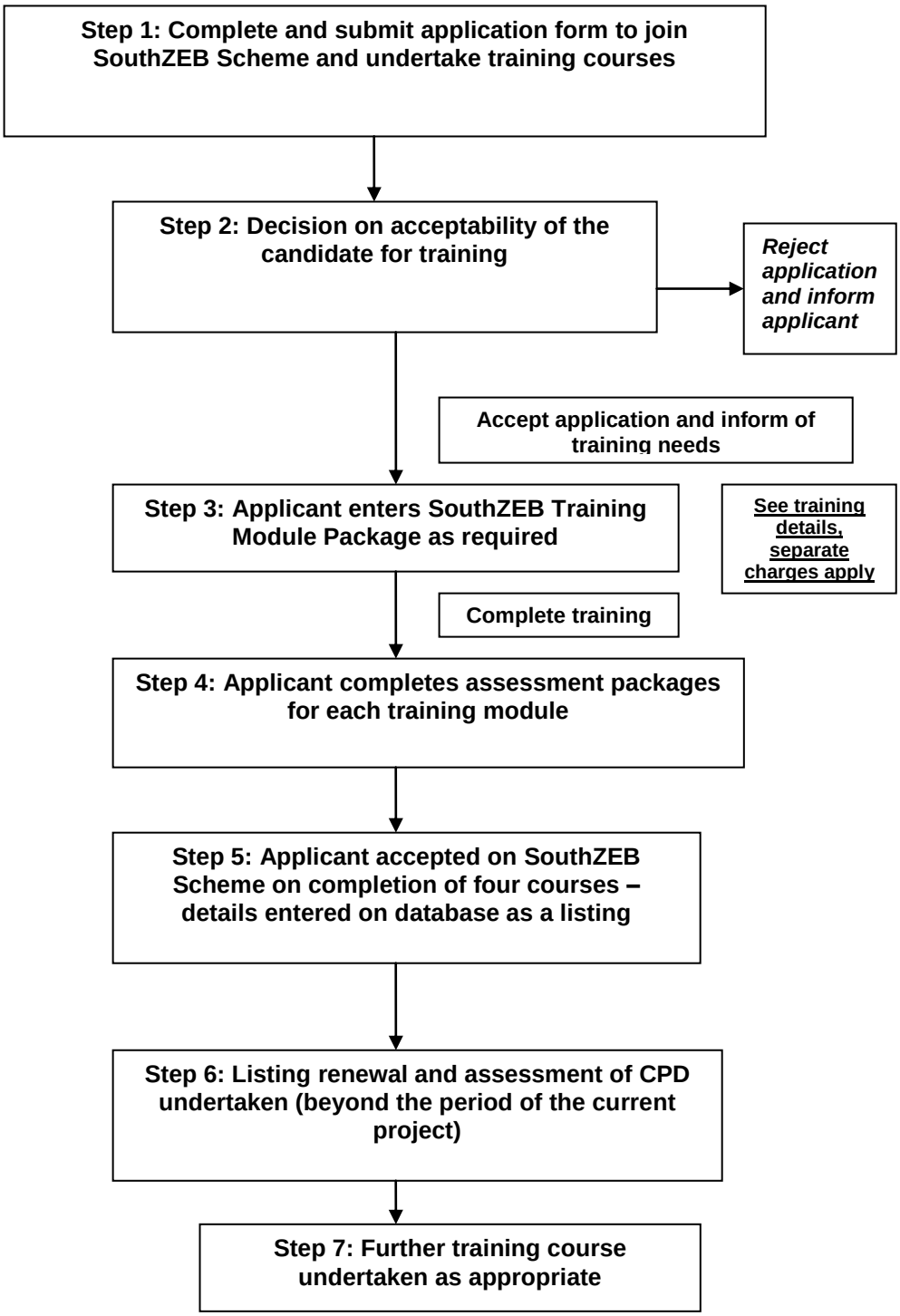
- Preceding course content to be retained within e-portal
- Accredited SouthZEB trainers to be alerted of revision electronically; advice and training to be provided as required
- Itemised list of proposed revisions to be provided within e-portal
- For each revision indicated, the proposed revision and a statement of the reason for each revision will be provided.

2.12 Timeframe of SouthZEB

The timeframe of the SouthZEB project covers the period from 2015 to 2020, including both trainers and trainees members. In the period after 2017 the SouthZEB initiative shall be the responsibility of the national partners in association with national stakeholders.

(Further details are available via the SouthZEB portal: www.southzeb.eu)

Figure 2.1: Certification Process



3 SouthZEB framework - trainer certification

3.1 Introduction

The key to the success and wide scale uptake of the SouthZEB project is the ability to deliver consistently high standards of training through the trainer network. Figure 3.1 sets out a simplified framework, where the training module is delivered by a SouthZEB trainer and multiple trainees are then trained. The intention is to increase the capacity of the construction sector in the four target countries to design, construct and operate near zero energy buildings.

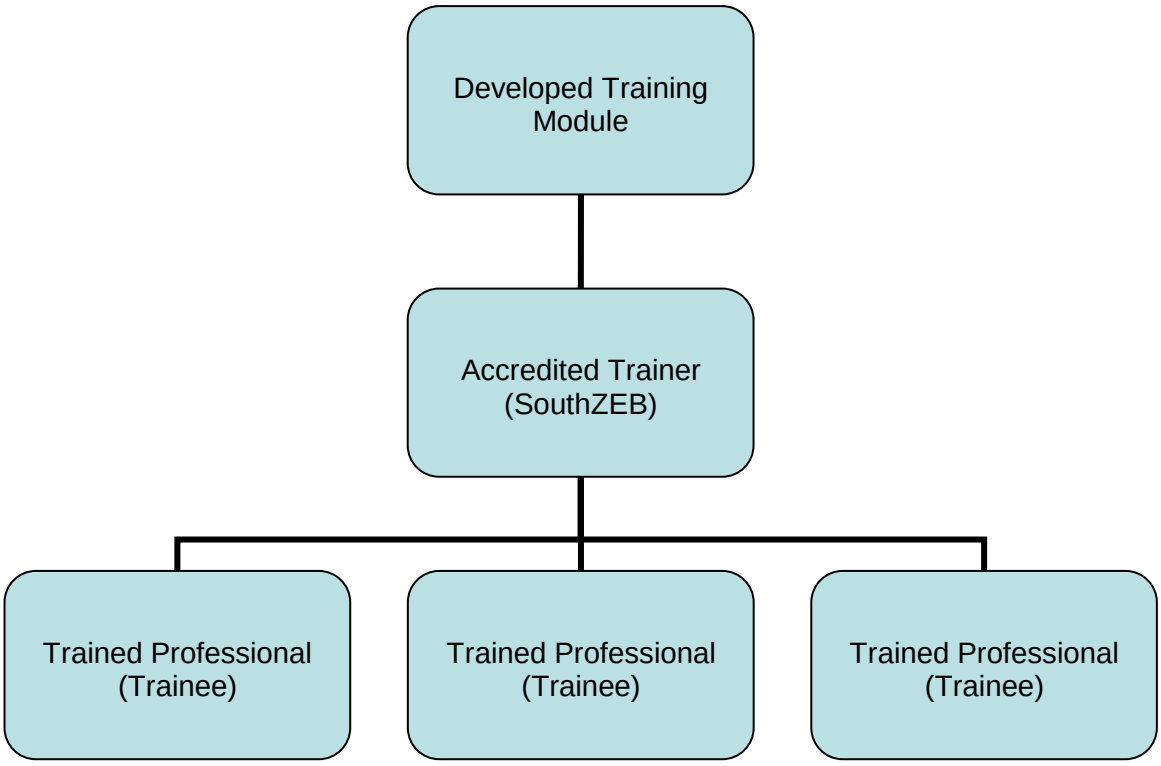


Figure 3.1 – Increased capacity through 'Certified Trainers'

3.2 Certified SouthZEB trainers

In order to ensure a consistently high level of training throughout the SouthZEB project all certified trainers must meet minimum competence requirements.

The SouthZEB trainers will require the following level of competence:

- A degree level qualification in a relevant discipline and more specifically the participant should be eligible in building's design and construction, at the SouthZEB manager's discretion equivalent qualifications or experience may be considered (European Qualifications Framework EQF Level 4).
- At least two and a half years' experience in a construction environment, although national perspectives will also be applicable and as such the period of time should be used as guidance.
- Membership of a relevant professional body.

In the period of the SouthZEB project the assessment of a candidate's suitability will be via a self-check. Candidates will enter their data on the portal, as long as the data fields are appropriately completed then their candidature will be accepted.

Figure 3.2 provides an overview of the process of accrediting a SouthZEB trainer.

SouthZEB trainers can be trained and certified to deliver one or more of the SouthZEB training courses. It is not necessary to complete all ten courses, but a minimum of four courses has been determined as necessary in order to become a SouthZEB trainer. The trainer will complete the training course including the pre-course material, the classroom training and the post-class training.

SouthZEB trainers will also be required to complete the train the trainer course, which can be undertaken through the portal.

On completion of the assessment (examination) for each module and achieving a suitable pass mark the SouthZEB trainer will receive a SouthZEB trainer certificate. The trainer will then be available to deliver training.

A trainer will be a member of SouthZEB for a period of not less than the period of the funded SouthZEB project.

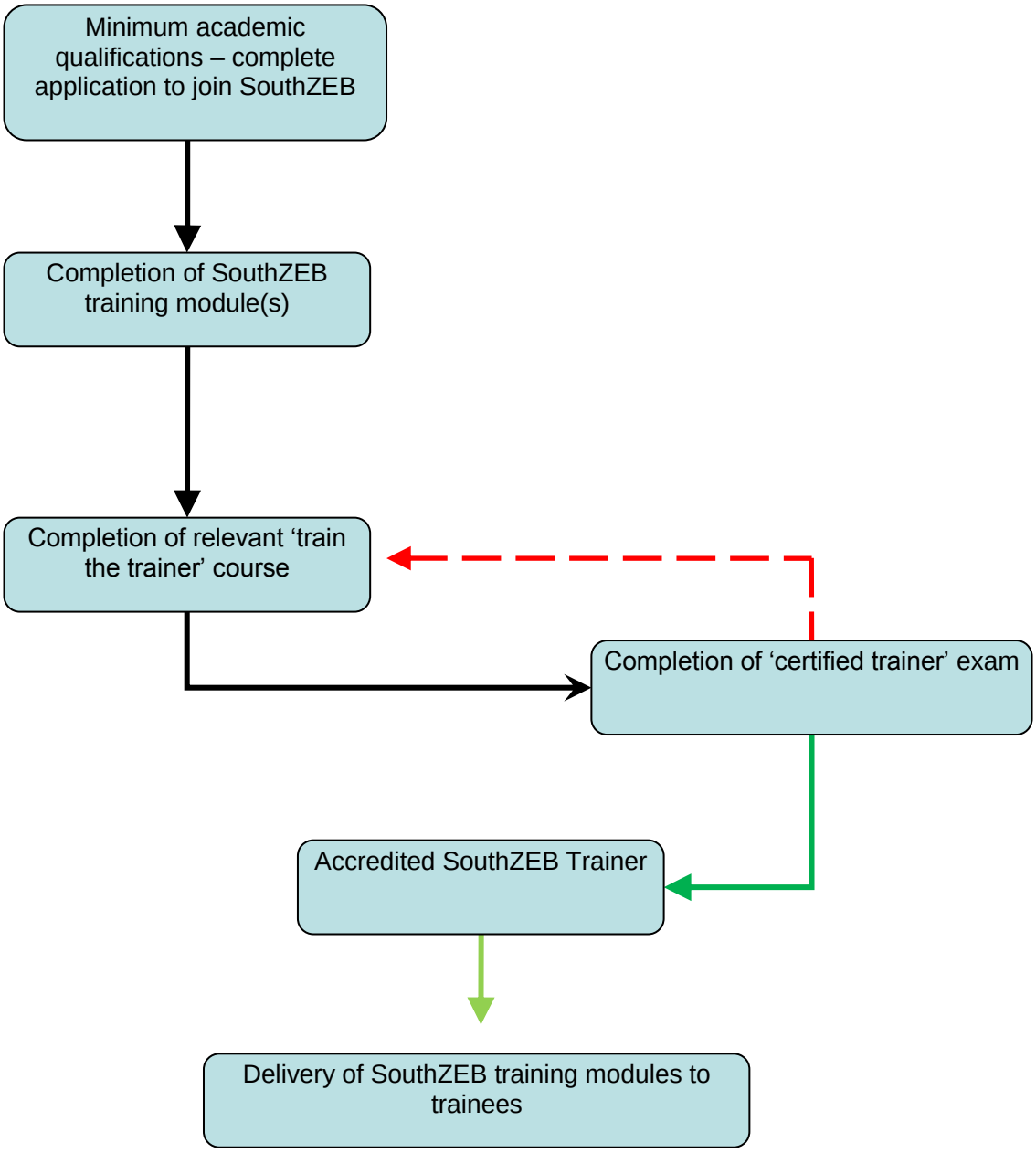


Figure 3.2: Certified SouthZEB Trainer Process

3.3 Trainer delivery appraisal

For each and every training module delivered by a certified trainer feedback will be received through the portal from those being trained. The National Partner will monitor feedback and any necessary trainer issues will be addressed.

As part of on-going competency assessment, certified SouthZEB trainers may be selected to undergo a 'training delivery' review. This will include the following:

> **Competency feedback** from trainees in the form of a simple questionnaire - which describes the skills, knowledge, and attitude displayed by the trainer during the delivery of their course content. It is stated that this procedure will be voluntary.
>
> **Classroom observation** of the trainer – which is undertaken by a SouthZEB Partner (or a suitable appointed agent of their behalf).

Prior to an appraisal being undertaken, the trainer and the SouthZEB representative will discuss and agree the competencies that will be the focus of the observation.

Formal feedback will be provided to the trainer in a report with recommendations for corrective actions. In circumstances where the performance of the trainer falls below that expected then membership may be suspended or removed. The assessment will be undertaken by the National Partner.

3.3.1 Removal from Certified SouthZEB Trainers scheme

The outcome of any monitoring and auditing activities shall enable the National Partner to:

- Maintain, suspend or withdraw certification as appropriate.
- Target CPD delivery into underperforming areas.

3.3.2 Code of Conduct

The Scheme is dependent on trust and strict adherence to the Code of Conduct. All members will accept the code of conduct, see Annex 2.

3.3.3 Disputes, complaints and appeals

Disputes, complaints and appeals are considered in the following context:

- Disputes, complaints and appeals by applicants to the scheme and scheme members against decisions by SouthZEB.
- Disputes, complaints and appeals by organisations and individuals arising from the activities of SouthZEB.
- Disputes, complaints and appeals by organisations and individuals against members of the scheme that are to be investigated by SouthZEB.

Disputes will be considered by the SouthZEB National Partners using defined properly conducted procedures. Key aspects of the response will include prompt action within the defined time limits to

acknowledge the complaint, to take account of it through the defined procedures, to notify the complainant of the outcome and to publish the result as required.

All complaints should be in writing and addressed to:

The National Partner, SouthZEB and be submitted through the on-line portal.

All complaints received by SouthZEB will be investigated and disciplinary actions taken where appropriate.

3.4 On-going trainer CPD

All Certified SouthZEB trainers will be required to undertake relevant further CPD training and to keep a record. The portal will have the facility to record ongoing CPD. The timeframe for CPD is a five year period. The requirements of CPD relate to new technologies, legislation issues and European Directives.

The CPD process helps members to manage their own development on an ongoing basis. Its function is to help you record, review and reflect on what you learn. It's not a tick-box document recording the training completed.

Development is often informal and has a wider application, giving you the tools to do a range of things and relating to capability and competency. It involves progression from basic know-how to more advanced, mature or complex understanding. Alternatively it can be about widening your range of transferable skills like leadership, managing projects or organising information.

To justify the name, a CPD needs to:

- be a documented process
- be self-directed: driven by you, not your employer
- focus on learning from experience, reflective learning and review
- help you set development goals and objectives
- include both formal and informal learning.

A CPD may be a requirement of membership of a professional body. It can help to reflect, review and document learning and to develop and update your professional knowledge and skills. It is also useful to:

- provide an overview of professional development to date
- reminder of achievements and progression
- direct career
- uncover gaps in skills and capabilities
- Open up further development needs
- provide examples and scenarios for a CV or interview
- demonstrate your professional standing to clients and employers

- helps career development or a possible career change.

3.5 Trainer conduct and performance

As a requirement of maintaining membership and standing as a 'Certified SouthZEB trainer', all trainers must agree to adhere to the schemes code of conduct and behaviour at all times (see Annex 2). This includes, but is not limited to, undertaking all activities associated with SouthZEB in a legal, ethical and responsible manner.

The performance of trainers should be rated through surveys of trainees that attended the classroom based training. The survey shall be completed after each course is delivered. However, completion of the survey by trainees shall not be compulsory.

4 SouthZEB framework – member certification

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

- Instructor-led, classroom-based learning
- E-learning.

For each SouthZEB module the trainees will be required to undertake initial course preparation involving reading and an initial on-line assessment. The classroom based course will then be delivered. After the classroom based training the trainee will have access to further on-line content that should be studied and the assessment taken within three months of the classroom training. Successful completion of the assessment and satisfactory qualifications will lead to membership.

4.1 SouthZEB e-portal and forum

An e-learning platform for remote training using the developed modules will be available, the SouthZEB portal. This enables remote and distance learning for much of course content at the convenience of the trainee, with the exception of the practical workshops.

Within the e-portal, a virtual forum is also accessible to enable collective discussion by building professionals, authorities, certification bodies, vocational trainers and researchers from across Europe. The forum enables users to interact with each other through avatars. In the forum, users can meet, exchange experiences and participate in group activities.

4.2 Access to course content material

SouthZEB course content will be accessible to trainees who register to undertake a training module. It is presented in the appropriate language and format for prospective trainees. In order to obtain access, trainees must undergo an online registration process, which will include providing the following relevant information:

- Name
- Company / sole practitioner status (as relevant)
- Address
- Email address
- Phone number
- Qualifications
- Professional memberships (including affiliation and member number)

- Acceptance of the scheme Code of Conduct.

4.3 Assessment

For each of the training modules there will be an initial and a final assessment for trainees run by National Partners. The initial assessment will be undertaken through the online SouthZEB portal, where candidates will have access to the test and score after their registration.

The final assessment exams will be undertaken on completion of all elements of the course. The final assessment will be based upon 100 questions per module that should be completed by the candidate.

The final assessment will not be remotely available, and all assessments will be undertaken under exam conditions, as follows:

- Applicants to provide proof of identity (passport, national ID card, photo driving license)
- No communication with any other candidates in any way during the assessment
- All assessment examinations will be independent from the others
- All assessment examinations will be within a set time period (to be undertaken no more than 28 days after completion of the classroom course).

The assessment will involve a further set of multiple choice questions. An agreed pass mark will apply for all final training module assessments.

4.4 SouthZEB scheme member certification

SouthZEB applicants who are eligible to join the scheme will be awarded membership based on the completion of at least four training modules and assessments (this must include the basic course – module 1 and the Advanced module – module 2).

The certificate will state the training modules completed and the dates on which they were completed and can be updated as further courses are added.

The certificate will be valid for a period of at least the SouthZEB project duration.

4.5 On-going member CPD

All Certified SouthZEB trainees will be required to undertake relevant further CPD training and to keep a record. Members will keep a record of all CPD training undertaken on the portal. The timeframe for CPD is a five year period. The requirements of CPD relate to new technologies, legislation issues and European Directives.

The CPD process helps members to manage their own development on an ongoing basis. Its function is to help you record, review and reflect on what you learn. It's not a tick-box document recording the training completed.

Development is often informal and has a wider application, giving you the tools to do a range of things and relating to capability and competency. It involves progression from basic know-how to more advanced,

mature or complex understanding. Alternatively it can be about widening your range of transferable skills like leadership, managing projects or organising information.

To justify the name, a CPD needs to:

- be a documented process
- be self-directed: driven by you, not your employer
- focus on learning from experience, reflective learning and review
- help you set development goals and objectives
- include both formal and informal learning.

A CPD may be a requirement of membership of a professional body. It can help to reflect, review and document learning and to develop and update your professional knowledge and skills. It is also useful to:

- provide an overview of professional development to date
- reminder of achievements and progression
- direct career
- uncover gaps in skills and capabilities
- Open up further development needs
- provide examples and scenarios for a CV or interview
- demonstrate your professional standing to clients and employers
- helps career development or a possible career change.

4.6 Member conduct

As a requirement of maintaining membership and standing as a 'Certified SouthZEB member', all members must undertake all activities associated with SouthZEB in a legal, ethical and responsible manner.

4.6.1 Code of Conduct

The Scheme is dependent on trust and strict adherence to this Code of Conduct. All members will provide their acceptance of the code of conduct, see Annex 3.

4.6.2 Disputes, complaints and appeals

Disputes, complaints and appeals are considered in the following context:

- Disputes, complaints and appeals by applicants to the scheme and scheme members against decisions by SouthZEB.
- Disputes, complaints and appeals by organisations and individuals arising from the activities of SouthZEB.

- Disputes, complaints and appeals by organisations and individuals against members of the scheme that are to be investigated by SouthZEB.

Disputes will be considered by the SouthZEB National Partner using defined properly conducted procedures. Key aspects of the response will include prompt action within the defined time limits to acknowledge the complaint, to take account of it through the defined procedures, to notify the complainant of the outcome and to publish the result as required.

All complaints should be in writing and addressed to:

The National Partner, SouthZEB and be submitted through the on-line portal.

All complaints received by SouthZEB will be investigated and disciplinary actions taken where appropriate.

5 Regional and national issues

5.1 National partner responsibilities

The SouthZEB project is an international cooperation between six countries, which focusses on Cyprus, Greece, Italy and Portugal as the target countries. National Partners refer to those partners in the target countries. They will be responsible for the progress and success of SouthZEB in each country. The differing populations and building industries in each countries means that the extent of their involvement will be variable. It is clarified that the following responsibilities refer to the period till the completion of the project (2016), as according to the partners the SouthZEB project after its completion shall be maintained optimally through other institutions.

The National Partner's responsibilities can be summarised as follows:

- To provide training to the SouthZEB trainers
- To organise and facilitate training to the SouthZEB trainees
- To take feedback from the trainees
- To address any disputes, complaints and appeals received
- To communicate with trainers and trainees as required for the delivery of training and assessment
- To promote the SouthZEB training courses in each of the target countries.

5.2 Regional and national narrative or adaptation

The technical and scientific principles behind each of the published training modules has remained consistent across all regions, actual course content has been adapted in order to best address the regional narrative and requirements in each area. The approach taken in nine out of the ten courses has been to focus 80% on the technical and related background information, with around 20% being inclusion of regional, national and local issues. Module 5 (see section 7) is much more specific to local architecture and regulation and is therefore 70% focussed on local issues.

The training content and assessment has been developed in the SouthZEB project in accordance with the plan developed by partners. Training and assessment will be made available by partners in the SouthZEB countries. Delivery mechanisms will be via classroom based learning and assessment and on-line modules.

5.3 National building standards and regulations

The training and certification framework has been initiated at the European level, based on the introduction of the Energy Performance of Buildings Directive and other Directives and Regulations. The programme of training modules and the certification framework is intended to be applicable across Cyprus, Greece, Italy

and Portugal. Therefore, reference to national building regulations is considered to be essential in the training modules.

6 Certification framework summary

The SouthZEB Certification framework has been described within this document, covering the basics of the scheme, its operation, trainer certification and member certification. In order to be able to implement the SouthZEB framework the on line portal (website) has been developed – see www.SouthZEB.eu.

The target audience for the SouthZEB training modules are professionals that are involved in the building sector, either in the design of new buildings or the rehabilitation of existing ones. The following list provides an overview of the target audience for the project:

- Building Professionals / developer companies is the largest target group, including all intermediate and senior professionals (engineers, architects, municipality employees) in the Southern European countries. They facilitate the construction of new buildings towards the nZEB targets;
- Authorities / decision makers will also benefit from training modules prepared to support the use of appropriate funding schemes and other incentives for the promotion of nZEB. Decision makers have been involved in the project course in order to better understand the legislation and regional roadmaps towards the application of the relevant EU directives;
- Property owners will benefit from the project effects as energy efficient buildings are less costly for the users. By facilitating the training of professionals in nZEB building, the local property value is raised in a long-term sustainable way;
- Vocational training / Certification bodies transfer the projects results to the community under a well European wide recognized educational framework.

The SouthZEB Experts Advisory Board plays an important role in the project valuable for the implementation of the Certification Framework and in the evaluation of its outcomes. The opinion of the members of the Expert Advisory Board has been required in different stages of the project, concerning the development of the e-learning portal and the training modules.

In some nZEB related areas there are context specificities that apply in some target countries, and not in others, it is of crucial importance to have a continued support from a group of key stakeholder institutions that helps in providing guidance towards the implementation of the goals of the project. As such, a National Support Group (composed of several key national stakeholders from the buildings sector like for instance professional associations, energy certification authorities, universities, etc.) was established in each pilot country. National Support Groups from each South EU target countries provide significant advice on the content of the training programs and will have a direct benefit from the project results since the training programs and e-learning platform are meant for their continuous professional development.

Training will be typically composed of three components: preparation hours, classroom hours and self-learning period. Each training module will include a final examination requiring physical presence. Front runner project partners countries will be actively involved in the train the trainer sessions.

A “nZEB Trainer” certificate will be awarded to a trainer that participates in “train the trainer workshops” and that has successfully completed a set of 4 nZEB specific training modules.

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 five years post-graduation experience in a suitable environment.

As a way to demonstrate their training capacity and the skills acquired throughout the training modules, the “trainers” will only achieve the “nZEB trainer” certificate if positively evaluated by “trainees” during the “Training the trainers” sessions in which they will actively participate as trainers.

Training the trainees will be typically composed of three components: preparation hours, classroom hours and self-learning period. Each training module includes a final examination requiring physical presence.

An “nZEB Designer” certificate is awarded to a trainee that participates in the training modules and that has successfully completed a set of 4 nZEB specific training modules (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.

The SouthZEB platform aims to accomplish the objective to supplement the face to face courses and providing the resources for deeper understanding of contents, as well as monitor their performance during the training. The SouthZEB e-learning platform hosts ten (10) training modules related to nZEB. Trainees who successfully complete a training module will be certified.

The scheme document contains much of the information set out previously within this report. Further documents which should then be developed and placed on the portal by the portal partner are as follows:

- Guidance on the scope of the SouthZEB framework and the countries involved
- Guidance on training modules and their completion
- Guidance on applicant requirements and the three membership levels (entry, advanced and industry leading)
- Guidance on the trainer requirements
- Application forms – for trainers and applicants/members
- Fee sheets – training costs, certification costs and annual membership (to apply after the SouthZEB project period only)
- Disciplinary procedures document
- SouthZEB terms and conditions
- Codes of conduct – trainers and members
- Frequently asked questions
- Glossary of terms
- Contact details and guidance on how to interact with the SouthZEB framework.

In addition to this set of documents the portal will contain a publicly available SouthZEB register of trainers and members. This register will contain the names and contact details (email and phone number) of each certified trainer and member, as well as the level that each member has achieved (entry, advanced or industry leading). The register will be set out by country. Details will only be placed on the register on completion of the required number of training modules and assessments.

Note that during the SouthZEB project period that members will be entered after completion of at least four training module and assessment. A pilot membership will be awarded that will have up to five years validity. Members may enhance their membership level over this period or subsequently.

The SouthZEB implementation will be based upon the collaboration agreement and business model between the partners in the four target countries and the front runner countries. The collaboration will be formalised into a business agreement, which will be applicable over a period. The agreement will indicate the responsibilities of the partners, the expected income and the mechanism for the share of income.

The framework set out within this document forms the basis for the creation of the SouthZEB certification of practitioners in near zero energy buildings within the countries of Cyprus, Greece, Italy and Portugal. The framework should be developed further in association with the development of the portal, which forms the basis of the implementation tool for the SouthZEB certification. The training framework that supports the certification scheme is set out in detail in this document. The training requirements to gain membership have been set out previously.

The SouthZEB training modules have been set out in some detail in Annex 4 (note that they are also further described in Deliverable 3.2). The modules have been translated into the different languages of the consortium. To enable the modules to be described for communication with the SouthZEB trainers and trainees a set of extended training module descriptions have been prepared. These extended descriptions are downloadable from the SouthZEB Portal. These detailed description documents are an extension of Deliverables D3.1 and D3.2.

7 Annex 1: SouthZEB Partners

The SouthZEB partners are as shown in table 8.1.

Partner	Country	Roles and responsibilities in SouthZEB scheme
University of Patras	Greece	Managing Partner and National Partner Greece Responsible for overall management of the training and certification scheme, ensuring that it is delivered in accordance with the requirements set out in this framework and elsewhere. The partner will be ultimately responsible for membership by trainers and members, this will include any disciplinary matters for members. The partner will ensure that all matters with regards to the legal constitution of SouthZEB are appropriately maintained.
KEK Eurotraining	Greece	National Partner Greece Responsible for the maintenance of the training courses and assessments associated, working with the responsible national partners in this regard.
Cyprus University of Technology	Cyprus	National Partner Cyprus The partner will ensure that relevant training courses and assessments will be kept up to date and will develop over time.
GARNET Energy Saving Limited	Cyprus	National Partner Cyprus The partner will ensure that relevant training courses and assessments will be kept up to date and will develop over time. .
DTTN	Italy	National Partner Italy The partner will ensure that relevant training courses and assessments will be kept up to date and will develop over time.
University of Minho	Portugal	National Partner Portugal The partner will ensure that relevant training courses and assessments will be kept up to date and will develop over time.
IST-ID	Portugal	National Partner Portugal The partner will ensure that relevant training courses and assessments will be kept up to date and will develop over time.

BEST	Austria	Portal Partner – front runner The portal partner shall create and make available the online portal system.
Building Research Establishment	United Kingdom	Technical Support Partner – front runner The partner will ensure that relevant training courses and assessments will be kept up to date and will develop over time.

Table 8.1: Partner list and role within the project

8 Annex 2: Code of conduct: SouthZEB Trainers

SouthZEB Trainer

As a Certified SouthZEB Trainer, I will:

(1) act with integrity and fairness;

(2) have regard to the public interest and to the interests of all those affected by their activities;

(3) do not maliciously or recklessly injure or attempt to injure the reputation of another person;

(4) avoid conflicts of interest;

(5) uphold the reputation of the Scheme.

The function of Trainers will be discharged, as follows:

(1) exercise appropriate skill, care, diligence and judgement in providing training;

(2) do not misrepresent themselves as having expertise and experience that they do not possess;

(3) maintain and broaden their expertise;

(4) undertake only those tasks for which they have appropriate expertise and experience;

(5) do not carry out training for those modules for which they are not approved;

(6) acknowledge that for some projects they may lack appropriate experience to enable them to act as the Certified Trainer; and

(7) disclose to the SouthZEB manager if they have been convicted of an offence by a court or have been subject to an adverse finding of any kind by any tribunal, court or other authority.

(8) be part of the construction and building industry with appropriate experience for the training courses delivered.

Signature:

Name:

Date:

9 Annex 3: Code of conduct: SouthZEB Members

SouthZEB Certification Scheme Members

As a Certified SouthZEB Scheme Member, I will:

(1) act with integrity and fairness;

(2) have regard to the public interest and to the interests of all those affected by their activities;

(3) do not maliciously or recklessly injure or attempt to injure the reputation of another person;

(4) avoid conflicts of interest;

(5) uphold the reputation of the Scheme.

The function of Memnbers will be discharged, as follows:

(1) exercise appropriate skill, care, diligence and judgement in providing services to clients;

(2) do not misrepresent themselves as having expertise and experience that they do not possess;

(3) maintain and broaden their expertise;

(4) undertake only those tasks for which they have appropriate expertise and experience;

(5) do not carry out work for which they are not qualified;

(6) acknowledge that for some projects they may lack appropriate experience to enable them to act as service provider; and

(7) disclose to the SouthZEB manager if they have been convicted of an offence by a court or have been subject to an adverse finding of any kind by any tribunal, court or other authority.

(8) be part of the construction and building industry with appropriate experience.

Signature:

Name:

Date:

10 Annex 4: Training modules - framework

10.1 Training Module 1: Basic module development

This module has not been changed from the Description of Work (2.1).

The module will be developed by CUT.

10.1.1 Module 1 description

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.

10.1.2 Duration and target audience

The duration of this module is estimated as 20 hours.

The module will be addressed mainly to engineers and architects.

10.1.3 Proposed topics in Module 1

Topics proposed by the focus groups were as follows:

- User Acceptance of Technical Solutions of nZEB;
- Building Technical systems (active) – Cost optimal solutions for each target country;
- Renewable energy – Different possibilities according to the buildings needs and availability of this resource;
- Building Regulations and other relevant documentation
- Status-quo of existing national definitions for nearly Zero Energy Buildings;
- Greek nZEB national criteria do not exist yet, curriculum should be proportionally adjusted, so as trainees could implement Greek directives once these are published.
- District Heating (or Teleheating) techniques.

10.2 Training Module 2: Advanced module development

This module has not been changed from the Description of Work (2.2).

The module will be developed by DTTN.

10.2.1 Module 2 description

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.

10.2.2 Duration and target audience

The estimated duration of the training is 40 hours.

The module will be addressed mainly to engineers and architects.

10.2.3 Proposed topics in Module 2

Topics proposed for inclusion by the focus groups were as follows:

- Principles of Bioclimatic Design and Bioclimatic Architecture, Building design (passive)
- Passive systems for heating-cooling and lighting (Passive Solar Heating Systems, Passive (Natural) Cooling Systems and Techniques, Systems and Techniques for Natural Lighting)

10.3 Training Module 3: Thermal bridging module development

This proposed module combines two modules from the Description of Work (2.3 and 2.4).

The module will be developed by BRE.

10.3.1 Module 3 description

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.

10.3.2 Duration and target audience

The estimated duration of the training is 20 hours.

The module will be addressed mainly to engineers and architects.

10.3.3 Proposed topics in Module 3

The proposed topics from the focus group were as follows:

- The training modules 3 and 4 can be unified in a single training module.

10.4 Training Module 4: Thermal Comfort

This module is new and has been proposed after focus groups in Portugal and Greece.

The module will be developed by UMINHO.

10.4.1 Module 4 description

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.

10.4.2 Duration and target audience

The estimated duration of the training is 20 hours.

The module will be addressed mainly to engineers and architects.

10.4.3 Proposed topics in Module 4

No specific topics were proposed by the focus groups, other than those set out in the description.

10.5 Training Module 5: SouthZEB framework module and local architectural regulations

This module has not been changed from the Description of Work (2.5).

The module will be developed by BRE.

10.5.1 Module 5 description

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.

10.5.2 Duration and target audience

The estimated training duration is 30 hours.

It is addressing the needs of engineers, architects and municipality employees.

10.5.3 Proposed topics in Module 5

Topics proposed by the focus groups for inclusion were as follows:

- How nZEB implementation could overcome obstacles posed by particularities such as apartment blocks, traditional settlements, islands and listed buildings.

10.6 Training Module 6: nZEB simulation and design software module

This module has not been changed from the Description of Work (2.6), but an expanded description has been provided.

The module will be developed by IST-ID.

10.6.1 Module 6 description

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?”

At the end of this training module the participants will have the capability to evaluate several design options with a building simulation tool and by that define the set of technical solutions more suitable to achieve nZEB. The following will be achieved:

- This training course focuses on improving the skills and knowledge required for carrying out energy simulations. Some questions will be answered through exercises, namely:
- How much detail is required to perform an energy modeling?
- What type of information is necessary?
- How to consider the envelope and building systems?

- How to consider the impacts of lighting, internal loads, occupancy and schedules on energy consumption?
- How to analyze simulation results and propose energy conservation measures (ECMs)?

10.6.2 Duration and target audience

The estimated duration of the training is 30 hours.

The module will be addressed mainly to engineers, architects and other building technicians.

10.6.3 Proposed topics in Module 6

Topics proposed by the focus groups for inclusion were as follows:

- Introduction to energy building simulation software
- Importing building geometry and characteristics
- Program and simulation options
- Model inputs and output results
- Existing accurate simulation models representing the building structure and the subsystems should be included in this module together with a comprehensive comparative review of existing simulation tools.

10.7 Training Module 7: Low carbon technology and automation for nZEB

This module description has been revised and expanded from the Description of Work (2.7).

The module will be developed by BRE.

10.7.1 Module 7 description

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.

10.7.2 Duration and target audience

The estimated duration of the training is 20 hours.

The module will be addressed mainly to engineers, architects and other building technicians.

10.7.3 Proposed topics in Module 7

Topics proposed by the focus groups for inclusion were as follows:

- Cost optimality of nZEB technical solutions
- The use of “intelligent” energy management, i.e., advanced sensors, energy control (zone heating and cooling) and monitoring systems.
- The management on the supply side, which involves optimization techniques of the energy produced, e.g. use of maximum power point tracking system for photovoltaics and wind generators, energy storage management or feeding the extra energy produced to the grid.
- Energy storage technologies.
- Potential role of wireless communication in NZEB.
- Building optimization and control methodologies for NZEB.
- Energy Hubs.

10.8 Training Module 8: Retrofitting towards nZEB” training module

This module has not been changed from the Description of Work (2.8).

The module will be developed by UMINHO.

10.8.1 Module 8 description

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.

10.8.2 Duration and target audience

This training module is addressed to the needs of engineers, architects and municipality employees.

The estimated duration of the training is 40 hours.

10.8.3 Proposed topics in Module 8

Topics proposed by the focus groups for inclusion were as follows:

- Existing buildings – How to incorporate all the above (see description) into existing buildings in order to became nZEB
- Definition of nZEB renovation
- Design framework for achieving nZEB in existing buildings
- Criteria to track nZEB housing renovation

- Examples of highly efficient refurbished houses should be included in this training module.
- nZEB list of renovated houses in each partner country should be presented.

10.9 Training Module 9: Development of the training module for construction management and field supervision of nZEB

This module has not been changed from the Description of Work (3.1).

The module will be developed by GARNET.

10.9.1 Module 9 description

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.

10.9.2 Duration and target audience

The module program will have to be adapted to the South European buildings and the outputs of WP2.

The estimated duration of the training is 40 hours.

10.9.3 Proposed topics in Module 9

No further topics were proposed by the focus groups.

10.10 Training Module 10: Development of the training module for decision makers - Preparation of funding schemes and other incentives for nZEB

This module has not been changed from the Description of Work (3.2).

The module will be developed by BRE.

10.10.1 Module 10 description

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).

10.10.2 Duration and target audience

The module program will have to be adapted to the South European buildings and the outputs of WP2.

The estimated duration of the training is 20 hours.

10.10.3 Proposed topics in Module 10

No further topics were proposed by the focus groups.