CEN-CE certified expert operating EU wide

The CEN-CE project is a H2020 project that introduces a training and qualification scheme with the aim to increase the skills of professionals to be able to use a new set of CEN standards for energy performance of buildings assessment and design towards the Nearly Zero Energy Buildings (NZEB). Besides a high quality training the scheme also sets the conditions for becoming a CEN-CE certified expert recognised EU wide and the rules how become a CEN-CE training operator. Building capacities and skills for using European standards will support the quality and harmonisation in the construction sector.

Keywords: training, qualification, heating, global cost, measured energy, European Standards, energy performance

Why training on new EPB standards is needed

The EU energy and climate targets require qualified professionals able to design nearly zero energy buildings and proof it by calculation of energy performance indicators as primary energy, CO_2 emissions, ratio of renewable energy and others, set by public authorities as requirement for NZEB. The calculation methodology for the energy performance of buildings (EPB) in several EU Member States refers fully or partly to European standards. New versions of CEN and ISO standards (M/480) were approved in 2017 and are implemented into national standardisation systems since 2018.

The reproducibility of the results from calculation of energy performance by different experts and the neutrality and level playing field for products is the advantage of harmonised calculation methodology based on CEN standards. **The training of professionals** is important to eliminate the unintentional systematic errors or occasional mistakes in calculation that can result in non-compliance with the minimum requirements and finally lead to under performance of new and renovated buildings.

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Manufacturers will profit from correct calculation for their specific products as CEN standards ensure they are correctly and consistently considered in the building performance assessment.

CEN-CE has a flexible modular structure that takes into account the harmonization with existing training schemes. **Training providers** can extend their training offers by CEN-CE training as stand-alone or implement just specific modules in their existing commercial or official trainings (e.g. Chambers of engineers). Qualified and/or certified independent experts for energy performance of buildings assessment based on European standards are needed also for **existing or future new certification schemes** for buildings (e.g. Voluntary common European Union certification scheme for the energy performance of non-residential buildings according to Art. 11(9) of the EPB Directive).

Why become a CEN-CE certified expert?

The aim of CEN-CE training and certification is to increase the comparability, quality and confidence in the professional competence for the European single market by offering professionals:

- **market advantage** by EU-wide **recognized competence** (quality mark) and possibility to be included in the public list of CEN-CE certified experts,
- helping and **saving time** for studying and understanding the new CEN standards,
- **training materials** tested and validated by building professionals that include examples on how to achieve NZEB with focus on current challenges (integration of RES, wind turbines, PV panels), measured energy and economic evaluation procedures,
- understanding of inputs and sensitivity on results **for correct use of software**;
- **corrections** of standards in training materials and proposal for amendment of standards where relevant.

CEN-CE training and certification scheme

As a first step, the CEN-CE training scheme focuses on heating and domestic hot water preparation systems, economic evaluation procedures (global costs, payback period), measured energy and inspection, that are standards in the responsibility of CEN/TC 228. The overarching standard EN ISO 52000-1 related to CEN/TC 371 is also included in the CEN-CE training to provide the holistic view and way of aggregation of partial calculations in the overall energy performance indicators. In the future, it is expected that the similar trainings will be processed also for other technical services (thermal envelope, ventilation, cooling and lighting).

Modular structure

The advantage of the CEN-CE modular structure is that professionals can be trained only for selected standards. This allows the different initial background of experts or specific product oriented interest by industrials (e.g. in heat pumps, PV). The courses are offered in a short time format maximum 4 hours per standard based on its complexity. This allows professionals acquiring skills on a step-by-step basis gradually over a longer period of time and does not require long interruption from their usual daily business.

All standards for which it is possible to complete the training are listed in the achieved certificate and highlighted are those standards for which a particular person has passed the exam. This enables distinguish between competence of experts who are trained and certified for the whole set of CEN standards from someone who is certified just for few of them. The list of standards for which CEN-CE training is prepared and an example of a certificate issued for expert who passed exam only on some of standards is shown in **Figure 1**.

To make qualification and outcome from CEN-CE training more readable and understandable across different countries and education systems the reference is made to the list of knowledge, skills and competences defined by European Qualifications Framework (EQF).

Training and qualification are focused on two levels of professionals. Training for higher level of professionals (EQF level 5+6) is suitable for architects, engineers, designers, auditors, software developers and developers of national calculation methods. Simplified training for lower level professionals (EQF level 4) is designed to understand the basic principles by installers but it is also suitable for building managers or public authorities without specific initial technical education.

The common structure of training materials for all standards emphasizes the understanding of the fundamentals and sensitivity to input data in the calculation of EPB. Each presentation contains an introduction,

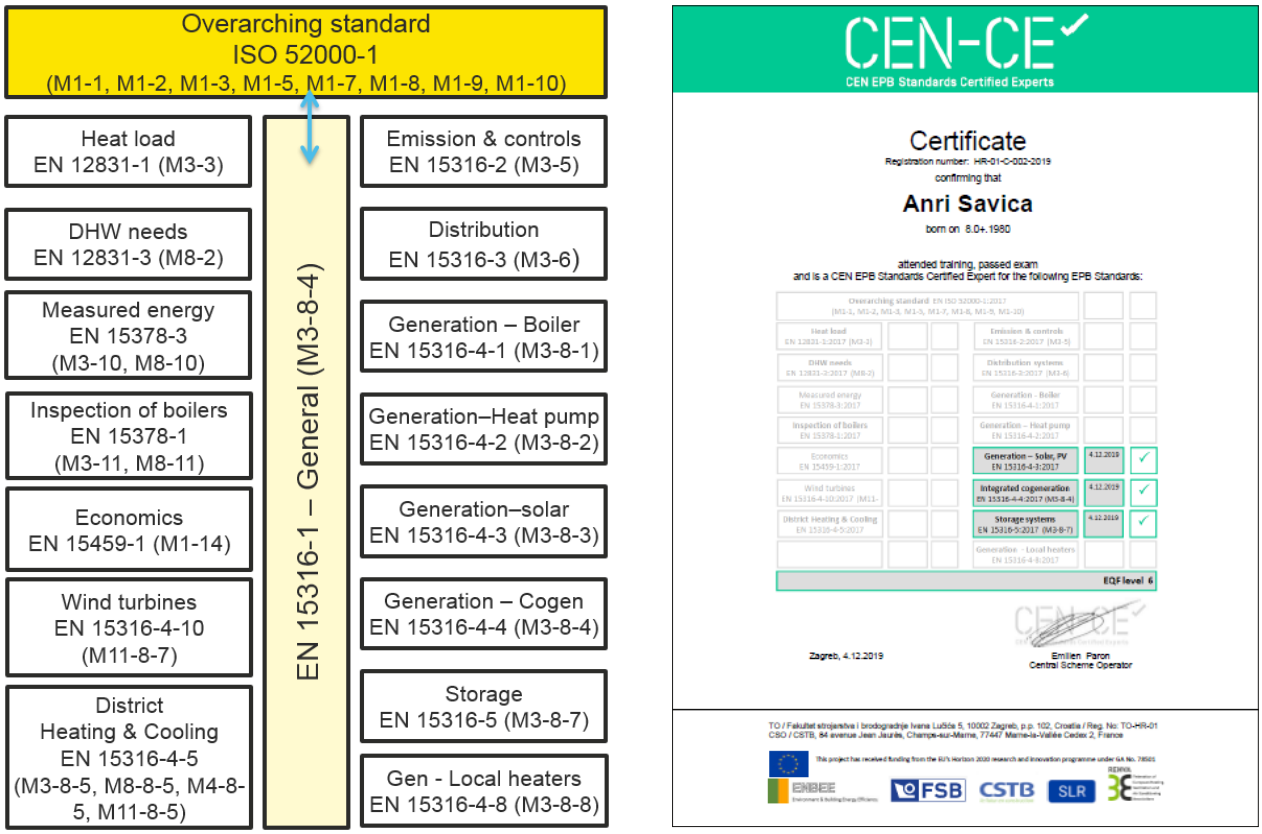

Figure 1. List of standards for CEN-CE training an example of CEN-CE certificate.

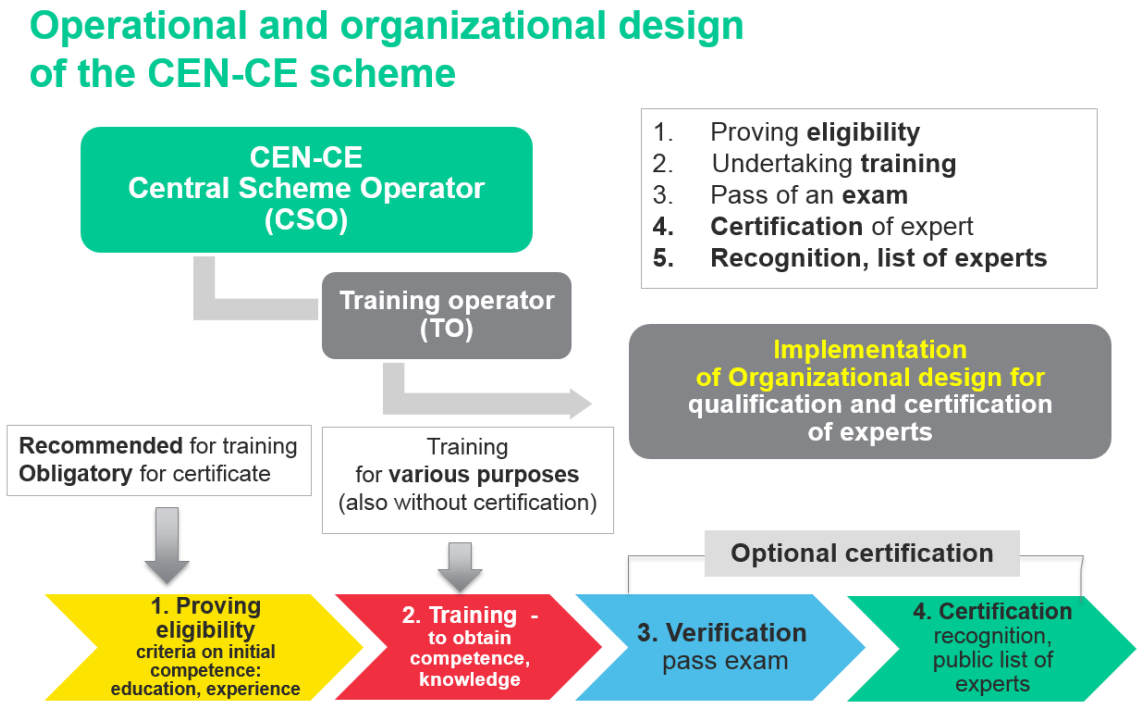

Figure 2. The organizational structure of the CEN-CE training scheme.

basic principles, input and output data, calculation procedure and examples. Several standards developers are members of CEN-CE consortium that guarantees the high quality and **uniqueness of training.**

Organisational structure of the CEN-CE training scheme

The CEN-CE scheme will be coordinated by a Central scheme operator (CSO) at the European level. The CSO will delegate (license) the trainings to different interested organizations (training operators) who will run the training. Pass exam after training will be optional. Training operators (TO) will entered into a contract with the CSO. The main principles of CEN-CE scheme operation are described in **Figure 2**.

How to become Certified expert

After completion of the training, trainee have to pass successfully exam to become CEN-CE certified expert.

Anyone can attend the training without limiting conditions. The initial education level is just recommended for proper understanding the content of the training. However, to become a CEN-CE certified expert several requirements for proving eligibility will be required in order to guarantee the quality of qualification. Expert has to prove the level of initial education and experience to become a CEN-CE certified expert. The university degree for Certificate of EQF level 6 is required and high school/secondary school-leaving certificates for EQF level 5. Any lower education will be sufficient for EQF level 4 certificate. The 2 years of relevant experience during the last 6 years is also eligibility criteria for certification. Common template of certificate is proposed and the database of certified experts will be publicly available on the website of the Central scheme operator.

Only after attendance of training it is possible to take an exam. The exam consists of a series of questions to verify the understanding of the topic.

The CEN-CE certificate for EQF Level 4 ensures that expert can generate specific standard solutions, can build, optimise, tune, and repair an existing system. This is related to installers, building managers and other professionals who may have different level of initial education.

The learning outcomes for EQF Level 5 and 6 ensure a comprehensive range of cognitive and practical skills required to develop creative solutions to abstract problems, solve complex and unpredictable problems. Experts can design a new system and calculate the energy performance of a new or existing systems.

CEN-CE scheme will provide flexibility on passing an examination for assessment of learning outcomes by options for exam by presence, remote (e-learning platform) or self-assessment (informative for learning process). The options will depend also on the Learning Management System (LMS) currently under development.

The quality control, monitoring and surveillance as shown in **Figure 3** based also on feedback from trainees will be the role of Central scheme operator who will also maintain the master training materials. These materials will be translated into the consortium languages but can be latter translated by training operators to any other language.

The certification process addresses also trainers who will be trained by the Central scheme operator.

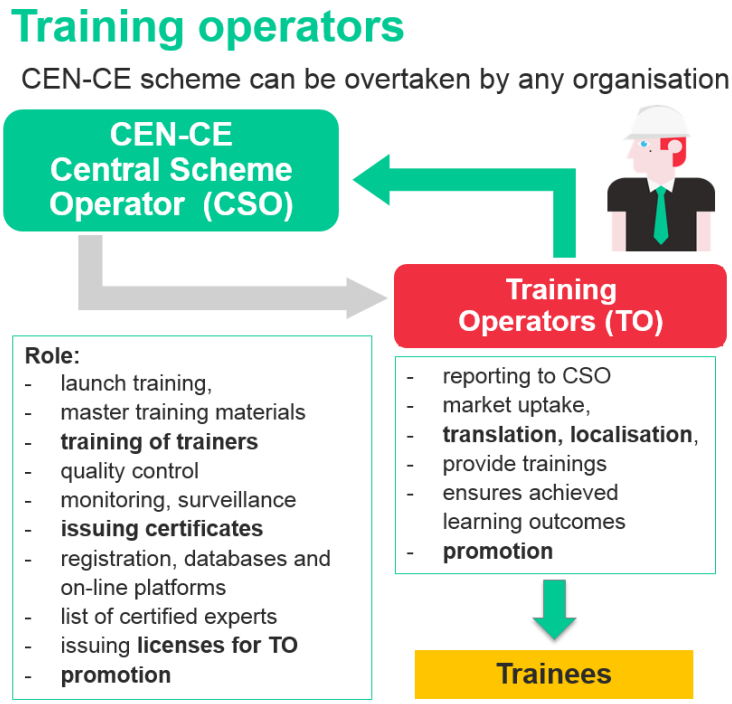

Figure 3. The roles of CEN-CE training scheme operators.

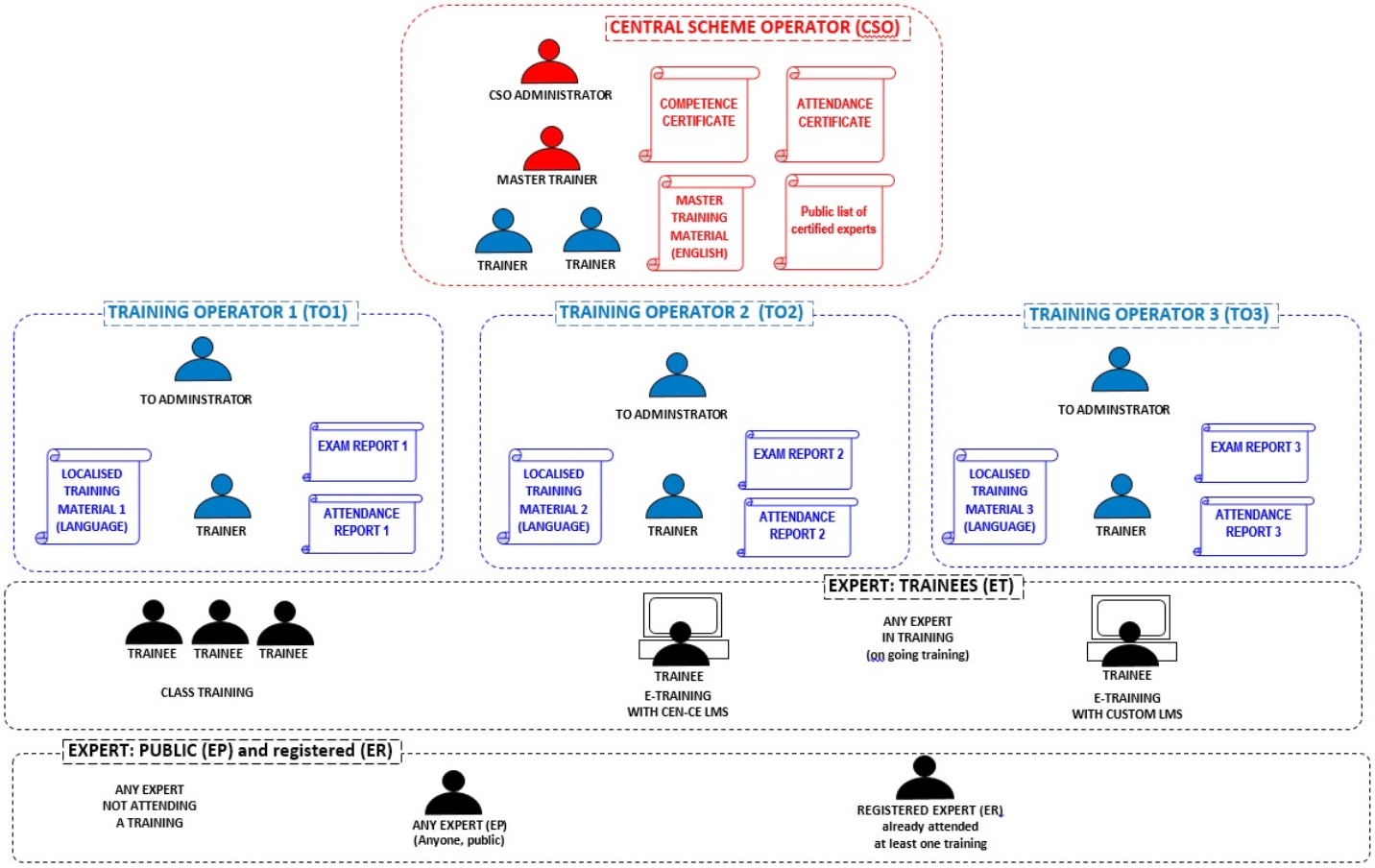

Figure 4. The types of trainings and roles of involved entities.

How to become Training operator

The scheme will be of pan-European significance. The CEN-CE training system will be commercial. The project consortium verifies the training scheme and training materials in trainings organized for free within the duration of the project. The first training took place in December 2019 at the University of Zagreb, second took place in February in Italy. Next training was planned for April in Slovakia organised by Slovak Chambers of civil engineers responsible for official training and accreditation of experts, but has been postponed due to the developments with Covid-19.

E-learning infrastructure will be developed with three types of training possible, class training, e-learning using CEN-CE Learning Management System or e-learning by other the custom learning management system (**Figure** 4). ■

References

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