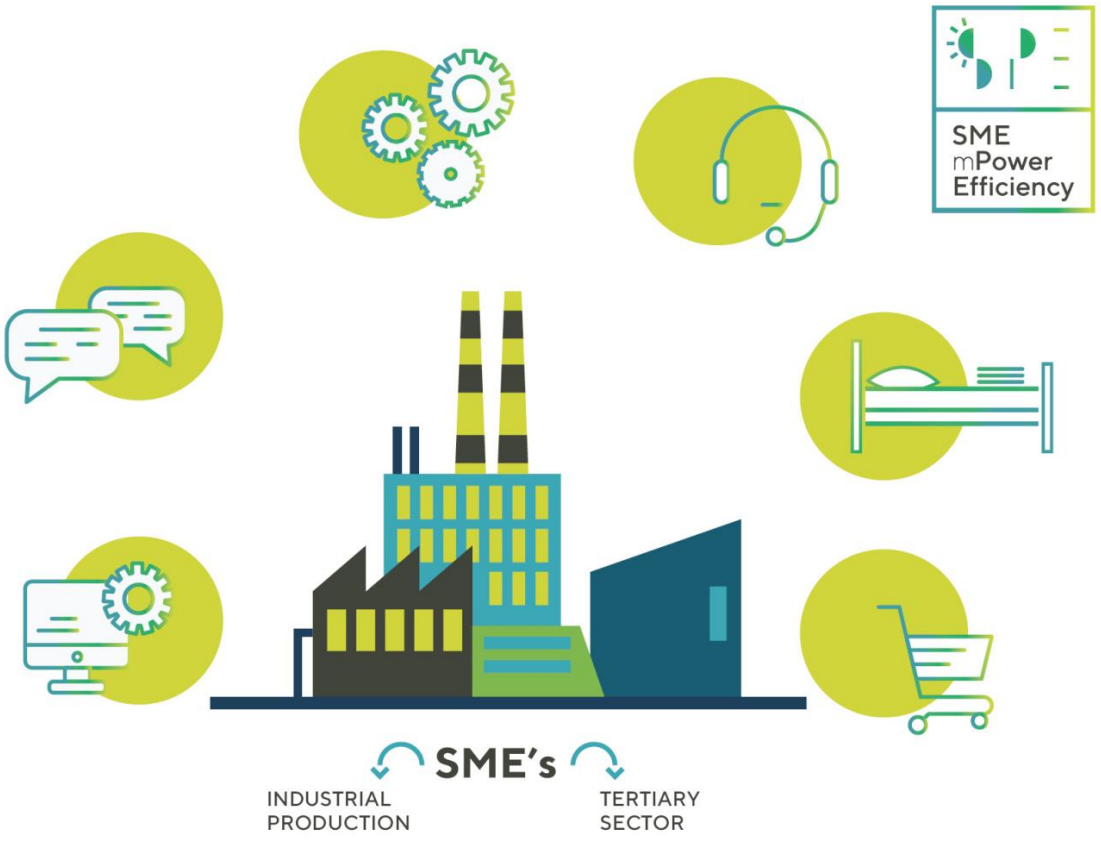
A holistic framework for Empowering SME's capacity to increase their energy efficiency

"Available certification schemes and training courses for energy auditors/managers"



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List of Acronyms

Acronym	Meaning
ACCREDIA	The Italian Accreditation Body
AEE	Association of Energy Engineers
AEM	Advanced Energy Auditors, UK
AENOR	Spanish Association for Standardization and Certification
ANRE	National Authority for Energy Regulations, Romania
ANSI	American National Standards Institute
ASHRAE	The American Society of Heating, Refrigerating and Air-Conditioning Engineers
ATECYR	Spanish Technical Association of Air Conditioning and Refrigeration
BAFA	Federal Office for Economic Affairs and Export Control, Germany
BEAP	Building Energy Assessment Professional
BSI	British Standards Body
CEA	Certified Energy Auditor
CEM	Certified Energy Manager
CQI	Chartered Quality Institute
DENA	Deutsche Energie-Agentur GmbH, German Energy Agency
ECTS	European Credit Transfer and Accumulation System
EED	Energy Efficiency Directive
EGE	Expert in energy management, Italy
ENAC	National Accreditation and Certification Entity, Spain
EOPPEP	National Organization for the Certification of Qualifications & Vocational Guidance,Greece
ESCOs	Energy Service Companies
ETEK	The Cyprus Scientific and Technical Chamber
EUREM	European Energy Manager Training
EPB	Energy Performance of Buildings
FIRE	Italian Federation for the Rational Use of Energy
HRDA	Human Recourses Development Authority, Cyprus
IEMA	Institute of Environmental Management Assessment
IQNet	International Certification Network
IRCA	International Register of Certificated Auditors
LLC	Lifelong Learning Centre
MECI	Ministry of Energy, Commerce & Industry of Cyprus
M&T	Measurement and Testing
M&V	Measurement and Verification
OGRS	Official Gazette of the Republic of Slovenia
RAA	Regulatory Administrative Act
RES	Renewable energy sources
SME	Small and Medium Enterprise
UKAS	United Kingdom Accreditation Service
WP	Work Package

Executive summary

Europe 2020 is the EU's growth strategy that aims to ensure a smart, sustainable and inclusive economy, driven by five interrelated headline targets. These targets address education, employment, poverty and social exclusion, research and development as well as climate change and energy. With regard to the latter, specific targets include achieving 20% of energy supply from renewable sources, a reduction of greenhouse gas emissions of at least 20% as compared to 1990 levels, and an increase of energy efficiency by 20% as compared to a baseline projection [1].

In addition, the European Commission in December 2019, has adopted the European Green Deal which is a roadmap for **making the EU's economy sustainable.** The green deal will work through a framework of regulation and legislation setting clear targets to achieve a goal of net zero carbon emissions by 2050 at EU level; and a 50-55% cut in emissions by 2030 (compared with 1990 levels).

The Energy Efficiency Directive (EED) gives energy audits and energy management schemes a substantial role to play in improving energy efficiency in the end-use sectors, as can be read in its Article 8. The EED requires Member States to promote and ensure the use of high quality, cost-effective energy audits and energy management systems to all final customers. This concerns large as well as small and medium enterprises (SMEs) [1].

This report presents the findings on the **current certification schemes for energy professionals (energy managers and energy auditors**) in the SMEmPower Efficiency project partner countries **(Cyprus, Germany, Greece, Italy, Romania, Slovenia, Spain and the UK) and the EU**, and on existing training programs and methods.

The main goal of the report is to improve the level of information regarding the **availability of certification/accreditation schemes** for energy professionals (energy managers/auditors). In particular this Report aims at the following:

- Review the current certification/accreditation schemes in the SMEmPower participating countries and the EU;
- Identification of the contents of the available training courses both at national level (partner countries) and at EU level;
- Identification of the certification schemes' requirements and the national authorities/professional bodies involved in the process.

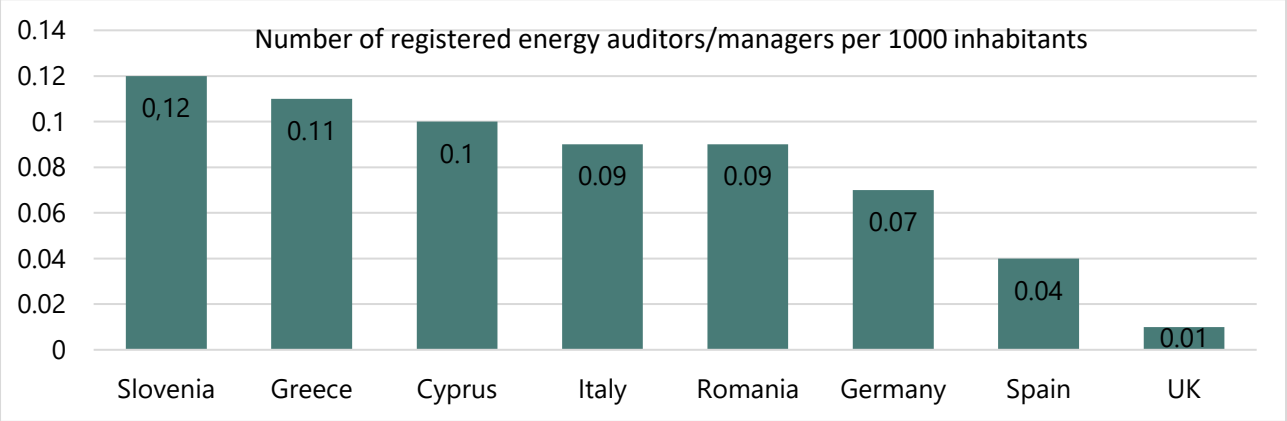
To analyze the data collected from the project partners in order to deliver a comparative analysis, a series of methodological tools were used:

- Qualitative analysis **(1) Identification of existing training courses, materials and tools in each country; (2) Identification of the existing Professional Certification Schemes; (3) Accreditation procedure according to national legislation in each participating country.**
- Quantitative analysis of the above-mentioned aspects.
- Conclusions and findings.

In almost all the participating countries, obtaining the qualification (license) of a registered **energy auditor**, the certification requires an obligatory training and qualifying exam, clearly defined by

national regulations. Except for **Italy**, where the energy auditor is currently not a recognized professional, since the corresponding European legislation has not been transposed to Italy. In Italy, the role of an energy auditor is taken by the “Expert in Energy Management (EGE)". Regarding the **energy manager** profession, in all mentioned countries, the national rules are not so clearly defined (except **Cyprus & Romania**), and no minimum requirements and qualifications are needed. To have a university degree in select subjects or a technical vocational training, in most of the countries, is sufficient.

The total number of qualified energy auditors/energy managers does not depend on the size of the country. In the SMEmpower participating countries the number of qualified energy auditors/managers vary between 0,01 (UK) and 0,12 (Slovenia) per 1000 inhabitants. The number of available energy professionals vary between 0,23 (UK) and 3,50 (Romania) per 1000 SMEs.



Country	Number of energy auditors/ managers	Population (2019)	Number of energy auditors /managers per 1000 inhabitants	Number of SMEs (2017)	Number of energy auditors /managers per 1000 SMEs
Cyprus	84	875.899	**0,10**	52.657	**1,62**
Germany	5.481	83.019.213	**0,07**	2.504.371	**2,19**
Greece	1.169	10.724.599	**0,11**	719.492	**1,62**
Italy	5.203	60.359.546	**0,09**	3.712.043	**1,40**
Romania	1.700	19.414.458	**0,09**	485.215	**3,50**
Slovenia	244	2.080.908	**0,12**	142.153	**1,72**
Spain	1.882	46.937.060	**0,04**	2.661.427	**0,71**
UK	500	66.647.112	**0,01**	2.144.122	**0,23**

Some countries (**Germany, Greece, Cyprus, Romania**) have a designated Ministry or National Agency that adopts, implements and monitors strict regulations covering all aspects of course organization e.g. the content/topics, training providers, trainers, entry qualifications, type of training provision (blended or not), etc. etc.). In some other countries (**Slovenia, Spain, Italy**) there are no specific regulations and the approval of training courses and this is done by public or private entities with recognized competences in the field (universities, other higher education bodies).

The Chapter 3 of this report presents the identification of existing training/professional courses, materials and tools, whereas Chapter 4 provides and overview of the existing certification schemes in the SMEmpower participating countries.

It is required an in-depth multidisciplinary approach of the new harmonised educational/training courses, in order the qualified engineers to be able to meet the expectations of a growing market demand and to allow mutual recognition. All the gaps identified are provided in detail in Chapter 6 of this report.

The energy efficiency topic is very dynamic. The training courses cover a wide range in-depth knowledge in vast fields. **Refreshment courses** should be organised by the training providers every 3 to 5 years. This is a common gap identified in all the participating countries, that relevant legislation/regulations do not include provisions for refreshment courses and their duration. The **course fee** is another important identified gap, as the cost of training varies between **250€ and 2.000€ + VAT, as well as the lengthy training courses and the inconvenient time schedules for SMEs personnel.** Therefore, the course cost should be proportionate to the size of SME and /or co-financed by VET national authorities.

Based on the comparative analysis carried out in this report it is highlighted a major gap between energy professionals training courses and the specific market requirements, is the lack of specialized educational courses at undergraduate level. Additionally, most of the available training programmes present a lack of modules e.g. onsite visits, practical case studies, and M&T/M&V instrumentation knowledge.

Besides the energy auditor and/or energy manager certification schemes imposed by national legislation through the competent national authorities, there are several international certifications schemes available across Europe and Worldwide (presented in paragraph 4.2). The international certifications scheme related to the energy and building sector can be divided into certification of persons and certification of companies and/or institutions with an energy management system. The recognition and acceptance of these certification schemes at local / national levels varies from country to country, which is not enough for international mutual recognition.

Taking all the findings of this report into account, the training courses that will be developed within the SMEmPower Efficiency project (WP3) aim to provide an in-depth multidisciplinary approach in order to develop training courses for qualified engineers that shall meet the expectations in a fast-growing market.

More information about the SMEmPower Efficiency project can be found at https://smempower.com/.

1. Introduction

This Report has been developed through the implementation of the "SMEmPower Efficiency" project, funded by the Horizon 2020 under the Grant Agreement No. 847132/ 2019.

The report provides an overview of current implementation practices, tools and instruments related with the availability of training courses, certification/accreditation of energy managers/auditors, registration procedures and competent authorities within the different SMEmPower participating countries. Specifically, it addresses the national legislation requirements for energy auditors and energy managers, the competent national authorities, the available certification/ accreditation schemes, the number of available professionals.

To collect the necessary information to outline the framework in the participating countries, a specific collection of information template has been developed by the project consortium. It has been important, the following questions to be answered:

- Have the participating countries put in place certification schemes for the energy auditors and energy managers?
- Which are the conditions for the training providers, the training material contents and the tools?
- Have the participating countries put in place a publicly available registry of energy auditors and energy managers, and if yes which authority is responsible for the registry?

Finally, the **mutual recognition** is particularly important, thus the question should be answered is: an energy auditor or energy manager if certified and registered in one Member State is that qualification recognized in another Member State?

Related to this aspect it was considered useful to carry out a comparative analysis within the member states involved in the SMEmPower Efficiency project (**Cyprus, Germany, Greece, Italy, Romania, Slovenia, Spain** and the **UK**) regarding the existing training courses and certification schemes for the energy professionals (Energy Managers & Energy Auditors).

Figure 1. Objectives of the comparative analysis

Figure 1 provides an overview of the methodology followed and the three objectives are presented:

- Objective 1: Identification of existing training courses, materials, and methods.
- Objective 2: Identification of certification/accreditation schemes.
- Objective 3: Legal framework, requirements, and registries.

More details about the survey objectives and information collected are provided in Annex 1.

The outputs of this report will be used as input to other SMEmPower Efficiency project activities as follows:

- to the professional Education & Training activities (WP3)
- to serve as starting baseline contents for the SMEmPower Efficiency web platform (WP4);
- to prepare adapted energy management tools, especially for Measurement & Testing and Measurement & Verification, by considering the existing including online instruments and tools from Education & Training courses and other certified trainings;
- to the dissemination and communication activities (WP6).

2. Professional framework

The transition to energy efficiency societies requires a better, multidisciplinary education engineers, managers and policy makers. Related to this aspect, energy professionals has become a very complex figure with updated knowledge and skills crossing many fields beyond energy, including people management, environmental science and technology, finance, personal and enterprise communication, information and communication technologies, and even teaching skills [2].

Under Article 8(1) of the EED, member states must promote the availability to all final customers of high quality energy audits which are cost effective and (a) carried out in an independent manner by qualified and/or accredited experts according to qualification criteria; or (b) implemented and supervised by independent authorities under national legislation.

Under Article 16 of the same Directive, there are provisions where if a Member State considers that the national level of technical competence, objectivity and reliability is insufficient, it shall ensure that, by 31 December 2014, certification and/or accreditation schemes and/or equivalent qualification schemes, including, where necessary, suitable training programmes, become or are available for providers of energy services, energy audits, energy managers and installers of energy-related building elements as defined in Article 2(9) of Directive 2010/31/EU. Moreover, Member States shall ensure that the schemes provide transparency to consumers, are reliable and contribute to national energy efficiency objectives.

The following paragraphs, attemp to desribe the general qualifications and the professional framework of Energy Managers & Energy Auditos.

2.1. Energy Managers

The professional profile of an energy manager is not clearly defined in standards, qualification schemes or other educational frameworks.

Energy Managers monitors and manages the energy efficiency of a facility or organization. An energy manager implements conservation measures, monitor energy consumption, assess business decisions for sustainability and seek out opportunities for increasing energy efficiency [3].

Energy Manager performs many different tasks in order to optimize the energy performance of a facility, building or industrial plant and work in conjunction with engineers and consultants, in order to sustain and increase energy efficiency.

Energy managers perform inhouse energy audits - within their organisations/enterprises - to evaluate energy use, costs, or efficiency initiatives. They monitor and analyse energy consumption, and sometimes water consumption as well. They design energy efficiency projects and manage their implementation to ensure they meet deadlines, budgets, specifications, and legal requirements. This usually involves conducting life cycle analyses and inspecting job sites. Energy managers plan and renew energy initiatives for new construction, renovations, and retrofits that maximize energy conservation. They review plans for future projects to determine their feasibility and energy requirements.

Some energy managers are responsible for supporting LEED certification of green buildings or reporting greenhouse gas data to support voluntary climate commitments. Some also deal with utility procurement, ensuring that the company or client is getting the best value. Energy managers must write reports, work plans, and evaluation plans and submit them to management. Some are also tasked with identifying appropriate funding sources for projects and submitting the required documentation to funding agencies.

Energy managers are extremely important professionals who support climate change actions, conserve energy & natural resources, and maintain energy independence by making industries and offices more efficient and less wasteful. [4]

In general, the educational requirements for Energy managers are broad and consider the range of educational degrees and years of experience candidate may have. Students of certified energy manager courses have a combination of education and experiences.

2.2. Energy Auditors

The professional profile of the energy auditors is clearly defined by national laws or regulations, based especially on Energy Efficiency Directive (2012/27/EU) and EN 16247-5:2015 European Standard.

The Certified Energy Auditor is an individual who evaluates and analyses how energy is being used in a facility, identifies energy conservation opportunities, and makes recommendations where consumption can be reduced or optimized. [5] He/she is performing energy surveys, measurements, and energy balances calculation, to adequately argue an Energy Efficiency Action Plan.

Energy auditors are essentially building inspectors who provide consultations on energy efficiency and provide clients with actionable, real-world advice that can lead to important savings. For this purpose, they draw up an audit report that provides answer to the question – what to do, where to start, at what cost and for what benefits?

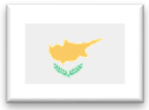
Energy audit helps in energy cost optimization, pollution control, safety aspects and suggests the methods to improve the operating and maintenance practices of the system. It is instrumental in coping with the situation of variation in energy cost availability, reliability of energy supply, decision on appropriate energy mix, decision on using improved energy conservation equipment, in-strumentations and technology.

2.3. Comparison between participating countries

The conditions and requirements to obtain license to practice for energy auditors/managers occupation, in the SMEmPower participating countries have common aspects but also some particularities and differences. In some countries the framework is clearly defined, whereas in some other the framework is board and relaxed.

Table 1 highlights the requirements imposed by the above-mentioned states in obtaining professional certification for the energy professionals.

Table 1: Requirements to obtain license to practice for Energy Auditors and Energy Managers

Country	For Energy Auditors	For Energy Manager
 **Cyprus**	• To be engineer licensed by the Cyprus Scientific and Technical Chamber (ETEK); • Mandatory attendance of training programs that are organized by licensed training providers for energy auditors; • To successfully passed examinations that are organized by licensed private examination bodies; • To has minimum 3 years of relevant experience in the field of energy efficiency and energy saving; • The energy auditor should submit application to the competent authority (Energy Service, MECI) and pay the fee. Once the application is approved, the energy auditor, is formally register in the energy auditors registry, kept by the competent authority and it is available online.	• Clear definition in National Legislation; • No minimum requirements and qualifications for a candidate in order to be nominated; • The only obligation for energy manager is to attend a training program covering the topics described by RAA 344/2016 National Regulation; • The appointment of an energy manager is on a voluntary basis and it is up to each enterprise or organization or public body or competent public authority to delegate to a member of their staff the duties of an energy manager; • A person licensed as energy auditor could be directly appointed as energy manager (if employed by an enterprise), without attending to any other additional training program.
 **Germany**	• To have a university degree in select subjects or a technical vocational training; • In order to be able to conduct audits, the auditor needs to have passed at least the base certification courses.	• To have a university degree in select subjects or a technical vocational training.
 **Greece**	• To be qualified engineers, members of the Technical Chamber of Greece and technological education graduate; • To be engineers who have gained recognized professional qualifications in other countries, in accordance with the relevant national and European legislation; • It is not mandatory to attend a special training course or a relevant postgraduate program; • Energy Audits can be performed by energy auditors who are registered in the Energy Auditor Registry of the Ministry of Environment and Energy.	• Any graduate from a related HEI can act as an Energy Manager currently.

Country	For Energy Auditors	For Energy Manager
 **Italy**	• To pass EGE certification exam • To have s technical degrees, for example engineering degrees (civil and industrial sectors); different level of experience depending on the professional qualification according to standard UNI CEI 11339:2009;	• Is identified by the UNI CEI 11339: 2009 standard that defines its requirements; • According to national law, does not require specific qualifications and the appointment by an organization is enough; • The "Expert in Energy Management" (EGE) has the role of an energy auditor according to Italian law.
 **Romania**	• The imposed conditions are not established in the energy efficiency law, but by secondary legislation emitted by ANRE; • It is necessary to have received and passed a theoretical and practical course of specific knowledge of energy audits, given by a university recognized by the Ministry of Education and ANRE; • Specific regulations are under revision according to Govt Ordinance no. 1/2020	• It is necessary to have received and passed a theoretical and practical course of specific knowledge of energy audits, given by a university recognized by the Ministry of Education and ANRE. • A specific final examination is provided by ANRE based on case study for energy management regarding the company from which the candidate comes. • Specific regulations are under revision according to Govt Ordinance no. 1/2020
 **Slovenia**	• Energy audits can be conducted only by energy auditors, that comply with criteria (professional qualifications such as knowledge and experience) according to standard SIST EN 16247-5; • Computer skills, knowledge of foreign languages and past work experiences are usually obligatory.	• No minimum requirements are needed to obtain license to practice energy management profession on a national level. • According to EUREM programme, attending the programme and its activities and passing exams is obligatory, along with dealing with other necessary requirements; • Other seminars also require participants to attend their seminars and after they successfully pass the seminar training, they obtain the necessary certificates (see Appendix 2).
 **Spain**	• To have the qualification required by national law to be a competent technician (architect, technical architect, technical engineer, industrial engineer); • Be in possession of an official university degree or other degrees, Bachelor's or Master's in which basic knowledge of energy, building facilities, industrial processes, energy accounting, measurement equipment and data collection and saving techniques are taught energetic or else; • To have received and passed a theoretical and practical course of specific knowledge of energy audits, given by an entity recognized by the competent body of the autonomous community;	• It is necessary to have related experience (between 2-10 years, depends by the graduated specialty) and one of the degrees: engineering/ architecture degree of 4 years; bachelor's degree in technology, environmental science, physics, or earth science; 4-year bachelor's degree in business (or related field), associate degree of energy management; the associate degree of 2 years and 8 years of related experience; or, no qualifications/ degree; • All CEA candidates must attend a CEA preparatory training seminar, submit a CEA certification application, and pass an open book exam. • If any of the above requirements are not met, it is possible to apply for EMIT (Energy Manager In-Training) certification. To do so, you

Country	For Energy Auditors	For Energy Manager
	• To register with the Social Security as a self-employed worker. • In some Autonomous Communities of Spain, it is required both to demonstrate the corresponding technical qualification and to prove membership.	must attend a CEM preparatory training seminar or obtain a degree from an approved training provider, submit the CEM certification application, and pass the CEM certification exam. • The CEM certification is valid for 6 years."
 **UK**	• Be in possession of an official university degree for the subject applied for, or have or have equivalent experience or training, normally from within the work environment • To be certified as CEA "Certified Energy Auditor", for this it is required to be an engineering or architecture degree with at least 3 years of work experience or several years of work experience depending on applicant's educational background. • To be part of one of the professional associations like: Certified Energy Auditor International; The Chartered Institution of Building Services Engineers; National Energy Services Limited; The Institute of Environmental Management and Assessment;	• A relevant engineering or science degree or successful completion of the Energy Institute Level 2 course; • Minimum 4 years of a relevant experience either working as an Energy Manager or another related area;

In almost all the participating countries, obtaining the license of an independent energy auditor, the certification requires an obligatory training and qualifying exam, clearly defined by national regulations. Except for **Italy**, where the Energy auditor is currently not a recognized professional since the corresponding European legislation has not been transposed in this country. In Italy, the role of an energy auditor is taken by the "Expert in Energy Management (EGE)".

Regarding the energy manager profession, in all mentioned states, the national rules are not so clearly defined (**except Cyprus & Romania**), and no minimum requirements and qualifications are needed. To have a university degree in select subjects or a technical vocational training, in most of the cases, are sufficient.

A summary for the professional profile of energy auditors and energy managers, for each country, regarding the EED implementation in the local national legislation is presented below [6-30]:

CYPRUS
Energy Auditor
How the rights and responsibilities of energy auditors are defined in the national legislation?
RAA 184/2014 regulates matters relating to the training and licensing of energy auditors for buildings, industries, and transport. According to this in Cyprus there are regulated three categories of energy auditors, depending on the activities they cover: *Category A*: any type of building, regardless of size and cooling technology, ports, airports and street lighting are also included in this category; *Category B*: industrial sites and processes, agricultural sites; *Category C*: transport (excluding aviation and maritime). ***RAA 436/2015*** lays down a "Technical Guide", setting out the requirements and technical standards to be complied with by energy auditors in carrying out energy audits in the transport sector. While ***RAA 437/2015*** specifies the application of standard **EN 16247** parts 1, 2 & 3 in carrying out energy audits in buildings and industries. ***RAA 435/2015*** is authorizing the Energy Service officers of MECI to act as inspectors for energy auditors and to monitor the proper implementation of the legislation.
Energy Manager
How the rights and responsibilities of energy managers are defined in the national legislation?
RAA 344/2016 specifies the training requirements and the duties of energy managers. According to this energy manager's duties include, among other things, recommendations to an organization's management regarding measures for reducing energy consumption. The Regulation supports the promotion of energy efficiency on a voluntary basis through a company's, organization's, or government authority's involvement. The appointment of energy managers is also on a voluntary basis.

GERMANY
Energy Auditor
How the rights and responsibilities of energy auditors are defined in the national legislation?
According to ***EnEV 2014*** in Germany the rights and responsibilities of energy auditors are clearly defined by the *Federal Office for Economic Affairs and Export Control (BAFA).* Energy auditors are segregated in different categories depending on the area of expertise. For an energy auditor to be able to conduct audits that are officially acknowledged the auditor needs to have passed at least one base certification courses approved by BAFA. All the certified energy auditors are included in the "energy-efficiency experts" database of the German Energy Agency (DENA). To remain on the list energy auditors must take a "refresher" course every three years. In Germany, in order to apply for federal energy efficiency grants from the BAFA or the KfW Bank companies, SMEs must prove they received an audit or consultation from an accredited energy auditor.
Energy Manager
How the rights and responsibilities of energy managers are defined in the national legislation?
There is no obligation to have an energy manager in a company of any size in Germany. Only if companies are certified by ISO 50001 then there is a requirement to have an energy manager. Companies who implemented ISO 50001 is implemented, could profit from tax exemptions. However, all SMEs are exempted from the requirement to have an ISO 50001 to get tax exemptions, therefore this motivation to have an energy manager applies only for industry. On the other hand, several specialized certification/training courses for energy managers like EUREM (that firstly was firstly introduced is 1999 by the Nuremberg Chamber of Commerce, now present in 25 European countries, see section 4.2) are provided across Germany with the approval of BAFA.

GREECE
Energy Auditor
How the rights and responsibilities of energy auditors are defined in the national legislation?
According to ***National Law 4409/2016*** article 52, par. 3 (published in *Government Gazette A 136*) the activity of the Energy Auditor is provided by qualified engineers, members of the Technical Chamber of Greece and technological education graduates or engineers who have gained recognized professional qualifications in other countries, in accordance with the relevant national and European legislation. Energy auditors are entitled to sign the *Energy Performance Study*, as defined in par. 25 of article 2 of ***Law 4122/2013***, in conjunction with par. 2 of article 12 of the ***Energy Performance Directive for Buildings*** only if they are registered in the Energy Auditor Registry (link) of the Ministry of Environment and Energy.
Energy Manager
How the rights and responsibilities of energy managers are defined in the national legislation?
In Greece the Energy Manager does not have an explicitly defined profile by the national legislation, and therefore any graduate from a related Higher Educational Institution can act as an energy manager in a company or organizations.

ITALY

Energy Auditor

How the rights and responsibilities of energy auditors are defined in the national legislation?

Since the corresponding European legislation has not been transposed in the national legislation yet, the "Energy Auditor" is not a recognized professional in Italy. The role of an energy auditor is taken by the "Expert in Energy Management" (EGE – in Italian "Esperto in Gestione dell'Energia") as identified by the ***UNI CEI 11339: 2009*** standard. EGE is a certified professional who is not required to be also an energy manager, but It is mandatory to conduct energy audits according to ***Legislative Decree 102/2014*** (transposition of ***Directive 2012/27/EU***). EGE have no special professional rights, they keep the rights related to their role prior the certification. EGE can work as freelance or as employees in a company.

Energy Manager

How the rights and responsibilities of energy managers are defined in the national legislation?

According to ***National Law n.10*** of ***9 January 1991*** the "Energy Manager" is an identified professional in Italy. The law establishes the tasks of an energy manager but does not require specific qualifications. Furthermore, there are specific professional qualifications recognized by regional authorities which also outline the necessary skills. Although the Energy Manager should have managerial, technical, economic-financial, legislative and communication skills, no formal qualification is required, but only an annual appointment by the company.

ROMANIA

Energy Auditor

How the rights and responsibilities of energy auditors are defined in the national legislation?

The ***Energy Efficiency Law no. 121/2014*** with its completion in Law no. 160/2016 defines the energy auditors for industry, their rights and responsibilities.

The regulation introduced by the National Authority for Energy Regulations (ANRE) for authorization, rights and duties of energy auditors are still in place, although since January 2020 due to a Government Act, ANRE has no longer any attributes in regard with the energy efficiency. The specified Government Act (from 14th of January 2020) moves the energy efficiency domain to the Ministry of Energy, which up to present day (May 2020) has not undertaken any measures in this field.

The ***Energy Performance of the Buildings no. 372/2005*** with its upgrades defines the energy auditors for buildings, as the only recognized energy efficiency specialists (!?), ignoring thus the industrial energy efficiency.

The Ministry of Development emitted an official Regulation for the energy auditors for buildings authorization, rights and duties.

Energy Manager

How the rights and responsibilities of energy managers are defined in the national legislation?

The ***Energy Efficiency Law no. 121/2014*** with its completion in Law no. 160/2016 defines the energy managers for industry and local communities, with their associated rights and responsibilities.

The ANRE Regulations for authorization, rights and duties are still in place for the above-mentioned professionals, although ANRE has no longer any attributes in regard with the energy efficiency.

SLOVENIA
Energy Auditor
How the rights and responsibilities of energy auditors are defined in the national legislation?
Article 7 of the Official Gazette of The Republic of Slovenia (UL RS, št. 41/16) specifies that energy auditors are defined by the national authority: Ministry of Infrastructure (Energy Directorate). According to this, an energy auditor can be a person, that has all the professional qualifications for conducting an energy audit according to EN 16247-5: it has all the necessary knowledge and experience from energy sector (production and distribution of energy, RES, energy management, energy systems and energy building management); the knowledge of using appropriate tools and programs for energy consumption simulations, the knowledge of buildings' life cycle economic analysis and the knowledge to prepare measures for increasing energy efficiency in buildings. Additional licenses, issued by the Ministry of Infrastructure (Energy Directorate) are assigned for licensed independent experts in areas such as air conditioning, heating systems and EPC's, and are thoroughly explained in the Energy Law EZ-1 (Article 341) with the requirements to obtain such licenses.
Energy Manager
How the rights and responsibilities of energy managers are defined in the national legislation?
According to the Employment Service of The Republic of Slovenia, under the Standard Occupational Classification, there is an Energy Manager profession profile, mentioned only as a profession. There is no information whether some minimum requirements are needed to obtain license to practice as energy management, however the EUREM certification is wildly recognized and appreciated in Slovenia.

SPAIN
Energy Auditor
How the rights and responsibilities of energy auditors are defined in the national legislation?
Article 8 of ***Royal Decree 56/2016*** (on energy efficiency, regarding energy audits, accreditation of service providers and energy auditors and promotion of energy supply efficiency) specifies the requirements for the exercise of the professional activity of energy auditor. The professional profile of an energy auditor is could be recognized by different organizations and institutions by granting a certificate that accredits knowledge after the completion of various courses. According to ***RD 56/2016*** energy audits can be carried out by individuals. However, to be able to carry out the professional activity of energy auditor on their own, it is necessary to register with the Social Security as a self-employed worker. Liability insurance is not mandatory, although it is a guarantee of the energy auditor's response to possible sanctions or claims. In some Autonomous Communities of Spain, it is required for energy auditors both to demonstrate the corresponding technical qualification and to prove membership to specialized associations.
Energy Manager
How the rights and responsibilities of energy managers are defined in the national legislation?
Article 1 of ***Royal Decree 235/2013*** (which approves the basic procedure for certifying the energy efficiency of buildings. Last update: ***Royal Decree 564/2017***) indicates that the competent technician must be in possession of any of the academic and professional qualifications that enable the drafting of projects or the management and the direction of the execution of building works or the carrying out projects for

thermal installations, or for the subscription of energy efficiency certificates, or has accredited the professional qualification necessary to sign energy efficiency certificates.

On the other hand, the law also contemplates the professional profile of assistant technician in the energy certification process for buildings, who must be in possession of a vocational training qualification, whose skills include collaboration as an assistant to the competent technician in the process of energy certification of buildings.

UK

Energy Auditor

How the rights and responsibilities of energy auditors are defined in the national legislation?

In the UK, ***EDD Article 8*** implementation and transposition into national law has taken the form of the Energy Savings Opportunity Scheme Regulations which came into force in 17 July 2014. The Environment Agency has been nominated as the scheme administrator and is responsible for maintaining a list of approved registers. Energy audits need to be carried out by certified Lead Assessors with appropriate knowledge and experience.

There is no direct definition for energy auditor's rights or responsibilities in the national legislation in UK. However, the rights of an energy auditor fall under the same rights of Finance & Accounts auditor. In order to conduct full audit, he has the following responsibilities: engage with the people, understand the challenges, energy usage and patterns, how the plant operates and is controlled, how it provides & uses energy within the building, compare the design to what is being used and upon delivering a detailed facility audit, to identify improvements (FIMS) and/or opportunities; analyse blue prints and performs site surveys to identify mechanical, electrical, and control systems and determine facility operational characteristics; ensure service development process including internal partner management and handover from to service or project fulfilment. Furthermore, the British Standards Body (BSI), commissioned by the government to develop ***PAS 51215*** (provides benchmark setting for lead energy efficiency auditors), working with industry.

Energy Manager

How the rights and responsibilities of energy managers are defined in the national legislation?

In addition to Energy Performance Certificate and Green deal assessors, the UK market provides a wide range of training and qualification opportunities including postgraduate in Energy management and environmental management. Wildly appreciated are the training schemes and education packages provided by The Energy Institute and the Institute of Environmental Management Assessment (IEMA).

Energy manager responsibilities differ from one company to another, responsibilities of energy manager definition depend on the sector its working on and its project's needs. An energy manager performs different tasks to sustain and increase energy efficiency. In order to maximize energy efficiency, Energy Managers create and oversee the implementation of short and long-term projects and strategies that increase energy efficiency, reduce greenhouse gas emissions and minimize unnecessary consumption. They also implement energy-related cost-saving measures. Throughout the development process, they calculate the budget, project energy savings, and identify the goals for each project. They work with the engineering team to craft and implement these measures. They may also participate in the design and renovation of buildings to ensure their energy efficiency.

2.4. Energy professionals in the participating countries

The approximate number of qualified/certified energy auditors and managers in all partners' countries are presented in Figure 2. The total number of the qualified energy auditors and managers is relative to the population of each participating country (see Table 2).

In **Cyprus**, approximately 30 energy managers qualified form the European Energy Managers' (EUREM) training program. However, not everyone performs the duties of an energy manager as defined exactly in the legislation. Moreover, 54 energy auditors for Categories A, B & C are qualified and registered in the National Registry kept by the competent authority (link).

Germany has 4.331 experts officially listed as energy auditors in general and 1.150 experts listed as energy auditors specifically for SMEs. In addition, Germany has 10.833 experts certified to consult private landlords during the building process for energy-related matters or to audit finished buildings.

Table 2 Energy auditors/managers in SMEmPower Efficiency partner countries

Country	Number of energy auditors/ managers	Population (2019)***	Number of energy auditors /managers per 1000 population
Cyprus	84	875.899	0,10
Germany	5.481*	83.019.213	0,07*
Greece	1.169*	10.724.599	0,11*
Italy	5.203	60.359.546	0,09
Romania	1.700	19.414.458	0,09
Slovenia	244	2.080.908	0,12
Spain	1.882**	46.937.060	0,04**
UK	500*	66.647.112	0,01*

**Number of energy auditors and/or lead assessors*
***Number of energy service companies that could perform energy audit or energy management activities*
****Source: https://ec.europa.eu/eurostat/tgm/table.do?tab=table&plugin=1&language=en&pcode=tps00001*

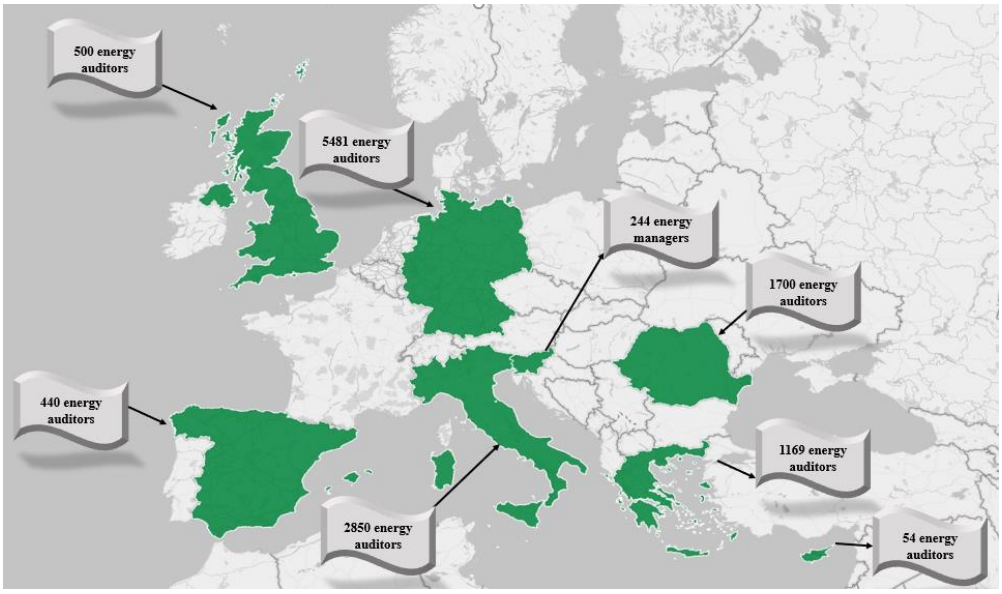


Figure 2. Number of qualified/certified energy auditors

According to the Greek Energy Auditor Registry, in **Greece**, there are approximately 1.169 energy auditors (link).

In **Italy**, there are 2.353 nominated EM (FIRE, link 12/2018) and 2.850 certified EGE (ACCREDIA, link).

In **Romania** there are 200 energy professionals authorized as industrial energy auditors, 600 industrial energy managers and local community energy managers (link) and approximately 1.500 energy professionals authorized as building energy auditors (link).

Slovenia has there are approx. 244 certified energy managers, and approximately 390 undergraduate and postgraduate energy engineers, who can potentially be energy auditors/managers.

In **Spain**, there has been an update on the list of companies registered in the IDAE, so the current number amounts to 1.882 energy service companies. No distinction is made between the professional profiles of energy auditors and energy managers. However, a summary of the energy auditors and energy managers registered on the www.certicalia.com website, showed 440 energy auditors and 180 Energy Managers. Worth mentioning that in Spain those number might not reflect the real situation as not all qualified Energy Auditors and/or Energy Managers are registered.

In the **UK** there are around 500 Energy Auditors plus Lead Assessors (link).

To identify the professional associations for energy auditors/managers, the following Table 3 has been prepared, which provides an overview of Professional Associations/National Professionals Registries in each participating country.

Table 3: Summary of Professional Associations/National Professionals Registries in each country

Professional Associations / National Professionals Registries	
Cyprus	• Energy Service, Ministry of Energy, Commerce & Industry (link) • Informal EUREM Alumni Cyprus
Germany	• "Energy-Expert List" (link) • Regional Chambers of Commerce
Greece	• TEE - Technical Chamber of Greece (link) • "Energy Auditors Registry" (link)
Italy	• FIRE - Italian Federation for Rational Use of Energy (link) • AssoEGE – Assosiation of Experts in Energy Management (link)
Romania	• SAMER - Romanian Society of Energy Auditors and Managers (link) • AAECR - Association of Building Energy Auditors from Romania (link)
Slovenia	• Engineering Chamber of Slovenia (link) • EUREM Alumni Slovenia (link)
Spain	• AEE Spain Chapter (link) • AIPE – Association of Professional Engineers of Spain (link) • A3e - Association of Energy Efficiency Companies (link)
UK	• UKAEE – UK Chapter of AEE (link) • EMA – Energy Managers Association (link)

3. Identification of existing training/professional courses, materials and tools

3.1. Overview of the existing training courses

Regarding the provision of professional training courses for energy auditors and energy managers, each country has its own legislation or rules that are applied.

In this paragraph, an overview of the current situation regarding the competent authorities for training approval in each country, is presented below in Table 4 to Table 6: below.

Table 4: Responsible Bodies for the approval of training courses/training providers in each country

❖ Is there a body responsible for the approval of training courses?	
Cyprus	• Energy Service of the Ministry of Energy, Commerce & Industry (MECI)
Germany	• Federal Office for Economic Affairs and Export Control (BAFA) • German Energy Agency (DENA)
Greece	• National Organization for the Certification of Qualifications & Vocational Guidance
Italy	• ACCREDIA - The Italian Accreditation Body • National and Regional/Local Chambers of Engineers
Romania	• Ministry of Energy (for accreditation courses for energy professionals) • Ministry of Education and Research (for certified training courses)
Slovenia	• Slovenian Quality Assurance Agency for Higher Education
Spain	• National Entity of Accreditation and Certification (ENAC) • Spanish Association for Standardization and Certification (AENOR)
UK	• United Kingdom Accreditation Service (UKAS) • University's Quality Assurance Committee and Education Committee (in case of training courses provided by universities)

Some countries (**Germany, Greece, Cyprus, Romania**) have a designated Ministry or Agency that adopts, implements and monitors strict regulations covering all aspects of course organization e.g. the content/topics, training providers, trainers, entry qualifications, type of training provision (blended or not), etc. etc.).

In some other countries (**Slovenia, Spain, Italy**) there are no specific regulations and the approval of a training course is done by public or private entities with recognized competences in the field of the course (universities, other higher education bodies). Some strict rules (specialized training, teaching experience etc.) are enforced for trainers in these countries, as trainers have the main role in preparing the curricula and designing the courses (required teaching units, what infrastructure is needed, preparing teaching materials etc.). When the financial and logistic support from the university (or other education entity) is secured, the courses can start and the certifications for the

trainees are released by the organizing institution. In these countries, there is no designated institution to keep track of all experts in the field of energy.

Training courses can be organized by Universities (in **all countries**), Chambers of Commerce, enterprises and other public or private training providers. In the countries with strict regulations, in order to offer a certified training course, the training provider must align the course content according to the content/topic requirements provided by the certifying institution/authority, that will allow the graduates to be qualified and included – if approved – to register in the "energy-efficiency experts" registries/databases. There are a range of different courses which allow trainees to receive different types of certification.

Nevertheless, in some other countries (currently even in **Greece**) there is no need to undertake such a course to become an Energy Auditor, but only the degree from certain Universities is required, or the completion of a specific training course provided by a certified/approved training provider.

Table 5: Summary of the approved training providers for energy auditors and/or managers

❖ Who can organize an approved training course?		
Cyprus	**Universities**	✓ University of Nicosia & Cyprus Energy Agency
		✓ Frederik University
Germany		✓ Chamber of Commerce
		✓ Private Training Institutions
Greece		✓ Vocational Training Centres
Italy		✓ Other Educational Institutions
		✓ Vocational Training Centers
Romania		• Training Centers (non-regulated private training)
Slovenia		✓ Other Educational Institutions
Spain		✓ Accredited training centers
UK		✓ Energy Institute
		✓ Accredited training centers

The training providers to organize a non-regulated private energy training, there are no specific requirements to be met, simply the trainers must be experts in the field. In the case of regulated certified trainings, current legislation must be complied and thus trainers must meet certain criteria.

The trainees also need, in some countries, to meet some base requirements, regarding their qualifications - a university degree (in Architecture, structural engineering, physics, building physics,

electrical engineering, civil engineering, technical building services, mechanical engineering, energy engineering) or certification as a technician in a relevant field.

Figure 3. Main steps in organising a training course

Looking at the existing training courses in SMEmPower partner countries, Table 6 summarises which are the main requirement for training providers in order to organise training courses respectively which are the minimum requirements for energy professionals to attend to it.

Table 6: Requirements of training courses for energy auditors/managers in each country

❖ What are the main requirements to organize a training course for energy auditors/managers?	
All Countries	❖ Approved training syllabus according to legislation; ❖ Approved training providers according to certain criteria. ❖ Necessary training infrastructure, facilities, and equipment by the training providers; ❖ Trainers should meet certain requirements. ❖ Trainees need to meet some qualifications, regarding university degree or certification as a technician in an appropriate field and/or relevant work experience.
❖ What are the main requirements to attend a training course?	
All Countries	❖ To be an Engineer, Architect, Energy or Management Professional or Qualified Technician (in case of training courses) ❖ To be an Engineer, Architect, Energy or Management Professional with work experience in the field (in case of accreditation courses)

3.2. Existing training courses for energy professionals

In the following tables a brief summary of the available training courses and educational programmes from SMEmPower Efficiency partner countries are presented. More information regarding: face training, blended, assessments, exams, case studies for each of these training courses are provided in Annex 2**.**

In conclusion, almost none of training programmes offer after course consulting for professionals and a lack of on-site visits has been noted. Also, refreshment courses are not provided.

Cyprus

Training Course Title	Provider(s)	Provided Certification or Qualification	Duration	Target Groups / Requirements	Face-to-Face Training	Practical Training	On Site Visits	Consulting after Course
Energy Auditors Categories A & B	University of Nicosia Cyprus Energy Agency	Attendance Certificate prerequired for the accreditation exams.	Type. A: 82h Type A&B: 128h	➢ Engineers only ✓ To be licensed by the Cyprus Scientific and Technical Chamber	☑	☑	☑	☐
Energy Auditors Category C	University of Nicosia Cyprus Energy Agency	Attendance Certificate prerequired for the accreditation exams.	36 h	➢ Engineers only ✓ To be licensed by the Cyprus Scientific and Technical Chamber	☑	☑	☑	☐
Energy Auditors Categories A & B	Frederick University, Nicosia	Attendance Certificate prerequired for the accreditation exams.	Type A&B: 120 h	➢ Engineers only ✓ To be licensed by the Cyprus Scientific and Technical Chamber	☑	☑	☑	☐
Energy Auditors Category C	Frederick University, Nicosia	Attendance Certificate prerequired for the accreditation exams.	32 h	➢ Engineers only ✓ To be licensed by the Cyprus Scientific and Technical Chamber	☑	☑	☑	☐
EUREM - European Energy Managers	Cyprus Energy Agency	Energy Manager Accreditation	90 h	➢ Energy managers; Those working in SMEs or Local Authorities. ✓ Engineers or graduates of Higher Technological Institute with at least two years of experience.	☑	☑	☑	☐
ISO 50001 Energy Management System	Cyprus Certification Company	ISO 50001 Certification	14 h	➢ Companies, Institutions following the ISO 50001. ✓ No requirements.	☑	☑	☐	☐

 **Germany** 

Training Course Title	Provider(s)	Provided Certification or Qualification	Duration	Target Groups / Requirements	Face-to-Face Training	Practical Training	On Site Visits	Consulting after Course
Audits + Consulting - Residential Buildings	Several providers in accordance with BAFA Guidelines	Registration as On-Site Consultant (BAFA); Inclusion in DENA database as *Energy Efficiency Expert*	160 h	✓ Architects; Engineers; Technicians; ✓ Base qualification according to the EnEv 2014 regulation	☑	☐	☐	☐
Planning and Implementation - Residential Buildings	Several providers in accordance with BAFA Guidelines	*"Energy Consulting for residential buildings"* Inclusion in DENA database as *Energy Efficiency Expert*	160 h	✓ Architects; Engineers; Technicians; ➢ Base qualification according to the EnEv 2014 regulation	☑	☐	☐	☐
Planning and Implementation - Non-Residential Buildings	Several providers in accordance with BAFA Guidelines	*"Energy Efficient building and renovating for non-residential buildings"* Inclusion in DENA database as *Energy Efficiency Expert*	60 h	✓ Architects; Engineers; Technicians; ➢ Base qualification according to the EnEv 2014 regulation and one the previous two courses	☑	☐	☐	☐
Consulting + Audits in SMEs	Several providers in accordance with BAFA Guidelines	*"Energy Efficiency Consulting and Auditing in SMEs"* Inclusion in DENA database as *Energy Efficiency Expert*	60 h	✓ Architects; Engineers; Technicians; ➢ Base qualification according to the EnEv 2014 regulation and one the first two courses	☑	☐	☐	☐

Greece

Training Course Title	Provider(s)	Provided Certification or Qualification	Duration	Target Groups / Requirements	Face-to-Face Training	Practical Training	On Site Visits	Consulting after Course
Energy Audit – Kenak Software Application for Building Energy Audit	University of West Attica	Attendance Certificate.	36 h	➢ Engineers; MSc equivalent ✓ As defined by article 52, par. 3 of Law 4409/2016.	☑	☑	☑	☐
ISO 50001: 2018- Basic Principles of Energy Management Systems	TÜV HELLAS	Attendance Certificate.	16 h	➢ Companies, Institutions following the ISO 50001 ✓ No requirements.	☑	☐	☐	☐
ISO 50001 CQI & IRCA certified Course. Inspectors / Lead Auditor of Energy Management Systems	TÜV HELLAS	Attendance Certificate required for IRCA Auditor accreditation.	50 h	➢ EnMS Process Control Engineers; Energy Management Consultants; Management Personnel involved in ISO 50001. ✓ No requirements.	☑	☐	☐	☐
ISO 14001: 2015 - Environmental Management System Auditor / Headquarters	TÜV HELLAS	IRCA-approved certificate. (A17948)	16 h	➢ All those wishing to register with the IEMA and/or IRCA auditors register ✓ No requirements.	☑	☐	☐	☐
ISO 14001: 2015 - Internal / Lead Environmental Management Systems Auditors	Eurocert	Attendance Certificate	40 h	➢ Executives of Organizations and Businesses involved in ISO 14001 ✓ No requirements.	☑	☐	☐	☐

Greece

Training Course Title	Provider(s)	Provided Certification or Qualification	Duration	Target Groups / Requirements	Face-to-Face Training	Practical Training	On Site Visits	Consulting after Course
EUREM – Energy Saving Seminar	German-Hellenic Chamber of Industry and Commerce	*"EUREM Certification"* 3 points for the Energy Auditors accreditation scoring scheme	36 h	➢ Professional Engineers ✓ Engineering degree is needed	☑	☐	☐	☐
Hellenic Passive Building Institute	Hellenic Passive Building Institute	Shell/Envelope Technician Systems technician	16 h	➢ Technicians ✓ No requirements.	☑	☐	☐	☐

Italy

Training Course Title	Provider(s)	Provided Certification or Qualification	Duration	Target Groups / Requirements	Face-to-Face Training	Practical Training	On Site Visits	Consulting after Course
Bases of Energy Management. Course for Energy Managers and EGE	FIRE Federazione Italiana Efficienza Energetica	Attendance Certificate The course is part of the updating activities for the maintenance of the EGE accreditation.	40 h	➢ Consultants; Energy Managers; Engineers; Certified EGE; ✓ No requirements are needed	Online	☐	☐	☐
Global Energy Management – Master Major	Luiss Business School	The Master provides students with 60 ECTS credits	1 year	➢ Bachelor's degree graduates ✓ Undergraduate Degree and the LUISS Admission Test	☑	☐	☑	☐
Training Course for Expert in Energy Management - UNI CEI 11339: 2009 - Industrial and Civil Sector	Sudformazione	Attendance Certificate or EGE Certification (if the final exam is passed).	12 days	➢ Engineers; Energy Management Technicians. ✓ Bachelor's degree along three-year experience or technical diploma with ten-year experience.	☑	☐	☐	☐
Energy consumption Management	University of Rome Tor Vergata	6 ECTS credits	One semester	➢ Mechanical, Energy and Management Engineering students ✓ No requirements are needed	☑	☑	☑	☐
Energy Manager	Festo Academy	Diploma of Attendance	6 days for full training	➢ Energy, Maintenance and Technical Services Managers. ✓ No requirements are needed.	☑	☑	☑	☐

 **Italy** 

Training Course Title	Provider(s)	Provided Certification or Qualification	Duration	Target Groups / Requirements	Face-to-Face Training	Practical Training	On Site Visits	Consulting after Course
Energy Manager	ENEA	Attendance Certificate (if requested)	40 h	➢ Energy Managers ✓ No requirements are needed ✓ High school diploma is needed	Online	☐	☐	☐

Romania

Training Course Title	Provider(s)	Provided Certification or Qualification	Duration	Target Groups / Requirements	Face-to-Face Training	Practical Training	On Site Visits	Consulting after Course
ACCREDITED Energy Manager for industry	Several accredited Technical Universities like: Politechnica University of Bucharest Technical University of Cluj-Napoca, "Gh. Asachi" University of Iasi Polytechnic University of Timisoara	Attendance Certificate prerequired for the accreditation exam	minimum 120 h	➢ Engineers employed in private or public companies ✓ Minimum 3 years of experience.	☑	☑	☐	☐
ACCREDITED Energy Auditor for industry		Attendance Certificate prerequired for the accreditation exam	16 h	➢ Engineers employed in private or public companies ✓ Minimum 3 years of experience.	☑	☑	☐	☐
ACCREDITED Energy Manager for Local Communities		Attendance Certificate prerequired for the accreditation exam	50 h	➢ Engineers employed in private or public companies ✓ Minimum 3 years of experience.	☑	☑	☐	☐
ACCREDITED Energy Auditor for Buildings		Attendance Certificate prerequired for the accreditation exam	minimum 190 h	➢ Engineers employed in private or public companies ✓ Minimum 3 years of experience.	☑	☑	☐	☐

 **Slovenia** 

Training Course Title	Provider(s)	Provided Certification or Qualification	Duration	Target Groups / Requirements	Face-to-Face Training	Practical Training	On Site Visits	Consulting after Course
EUREM - European Energy Manager	Jožef Stefan Institute– Energy Efficiency Centre	Licensed European Energy Manager (by Chamber of Commerce and Industry)	6-8 months	➢ Those responsible for energy management; Building Managers, Plant and Process Managers; Process Engineers. ✓ No requirements are needed	☑	☑	☑	☑
Energy Management Systems and Compliances with ISO 50001:2018	Bureau Veritas	Attendance Certificate	8 h	➢ Businesses; Energy Managers; Consultants; Energy auditors ✓ No requirements are needed	☑	☐	☐	☐
Seminar for Energy Auditors that Deal with Energy Management Systems Compliant with ISO 50001:2018	Bureau Veritas	Attendance Certificate	16 h	➢ Businesses; Energy Managers; Consultants; Energy auditors ✓ No requirements are needed ✓ No requirements are needed	☑	☑	☐	☐
Seminar for Energy Auditors that Deal with Environmental Management Systems Compliant with ISO 14001:2015	Bureau Veritas	Attendance Certificate	16 h	➢ Businesses; Energy Auditors; Employees or Consultants responsible for environment and waste management; ✓ No requirements.	☑	☑	☐	☐

 **Slovenia** 

Training Course Title	Provider(s)	Provided Certification or Qualification	Duration	Target Groups / Requirements	Face-to-Face Training	Practical Training	On Site Visits	Consulting after Course
Seminar for Energy Auditors that Deal with Environmental Management Systems Compliant with ISO 14001:2015 (CQI – IRCA approved)	Bureau Veritas	CQI-IRCA approved Certificate	5 days	➢ Those wishing to register with the IRCA auditors register; Professional dealing with environmental issues; Those responsible for environmental management systems ✓ Knowledge of ISO 14001:2015 and experience with internal audits.	☑	☑	☐	☐
Internal Auditors ISO 50001:2018	TÜV SÜD	Attendance Certificate	14 h	➢ Internal Auditors that deal with Energy Management Systems; Energy Managers; Process Engineers ✓ No requirements.	☑	☑	☐	☐
Energy Management System ISO 50001:2018	TÜV SÜD	Attendance Certificate	7 h	➢ Internal Auditors that deal with Energy Management Systems; Energy Managers; Process Engineers ✓ No requirements.	☑	☑	☐	☐
Seminar for Energy Auditors: Energy Management System ISO 50001:2018	SIQ	Attendance Certificate	35 h	➢ Businesses; Internal Auditors that deal with Energy Management Systems; Energy Managers; Energy Auditors; Ecologists ✓ No requirements.	☑	☑	☐	☐

Spain

Training Course Title	Provider(s)	Provided Certification or Qualification	Duration	Target Groups / Requirements	Face-to-Face Training	Practical Training	On Site Visits	Consulting after Course
Energy Management Specialist	Instituto Superior del Medio Ambiente	Certification granted by Instituto Superior del Medio Ambiente	250 h	➢ Environmental Managers; Technicians; Environmental and/or Energy Consultants; Professionals ✓ No requirements are needed	Online	☐	☐	☐
Energy Audit in the Company	Instituto Superior del Medio Ambiente	Certification granted by Instituto Superior del Medio Ambiente	170 h	➢ Environmental Managers; Technicians; Environmental and/or Energy Consultants; Professionals ✓ No requirements are needed	Online	☐	☐	☐
Expert Course in Energy Audits and Management	ATECYR	Certification as expert Auditor and Energy Manager issued by ATECYR	72 h + Online 200 h	➢ Installations and Energy Efficiency Professionals; Architects; Energy Service Providers; Industrial Engineers; Technicians; Senior and Middle level Managers; ✓ No requirements are needed	☑	☐	☐	☑
Energy Efficiency in Lighting Systems	Instituto Superior del Medio Ambiente	Certification granted by Instituto Superior del Medio Ambiente	50 h	➢ University students; Graduates, Bachelors; Masters, Technicians ✓ No requirements are needed	Online	☐	☐	☐
Saving and Energy Efficiency	Instituto Superior del Medio Ambiente	Certification granted by Instituto Superior del Medio Ambiente	100 h	➢ Environmental Managers; Technicians; Environmental and/or Energy Consultants; Professionals ✓ No requirements.	Online	☐	☐	☐

Spain

Training Course Title	Provider(s)	Provided Certification or Qualification	Duration	Target Groups / Requirements	Face-to-Face Training	Practical Training	On Site Visits	Consulting after Course
Energy Audits in Industry and Building	Circe	Certification accredited by ENAC	200 h	➢ Graduates; Master's degrees, Technicians ✓ No requirements.	Online	☐	☐	☐
Energy Auditor (Building + Industry)	Asociación de Empresas de Eficiencia Energética (A3e)	Attendance Certification that enables the access for the accreditation exam	100 h to 200 h	➢ Graduates; Engineers; Architects, Technical Architects ✓ Bachler degree in the above fields	Online	☐	☐	☑
Energy Audits (010709)	General Council of Associations of Industrial Engineers	Certification of Completion	100 h	➢ Engineers ✓ Engineers degree.	Online	☐	☐	☐
M-31 Energy Audits	AENOR	Certification accredited by AENOR	14 h	➢ Technicians and Managers of energy efficiency projects; Technical Consulting professionals; Facility Maintenance staff ✓ No requirements.	☑	☑	☐	☐
Practical Course of Conducting Energy Audits	Renovetec	No Certification	24 h	➢ Industrial and Technical Engineers ✓ Engineers degree.	☑	☑	☐	☐
Course of Saving and	Campus SEAS	University certificate	150 h	➢ Graduates	Online	☐	☐	☑

Spain

Training Course Title	Provider(s)	Provided Certification or Qualification	Duration	Target Groups / Requirements	Face-to-Face Training	Practical Training	On Site Visits	Consulting after Course
Energy Efficiency in Building		issued by San Jorge University, with 6 ECTS		✓ International Baccalaureate or Bachelor's degree or Higher Technician in Vocational Training or in Plastic Arts and Design or 1 year of experience in the field				
Energy Certification of Buildings. General Method with Leader - Calener (HULC)	Instituto Superior del Medio Ambiente	Certification granted by Instituto Superior del Medio Ambiente	80 h	➢ Construction Professionals; Engineers; Architects; Designers and Consultants in energy savings for buildings; ✓ No requirements.	Online	☐	☐	☐
Energy Certification of Existing Buildings. Option Simplified with CE3 and CE3X	Instituto Superior del Medio Ambiente	Certification granted by Instituto Superior del Medio Ambiente	70 h	➢ Professionals in construction, real estate, engineering, environmental and energy consultancy sectors. ✓ No requirements.	Online	☐	☐	☐
Building Energy Audit	Instituto Superior del Medio Ambiente	Certification granted by Instituto Superior del Medio Ambiente	150 h	➢ University Students; Graduates; Master's degrees; Technicians; ✓ No requirements.	Online	☐	☐	☐
Energy Efficiency of Buildings	Ministry of Labour and Social Economy	ENACC0108 Professional Certificate of Energy Efficiency of Buildings	800 h	➢ Graduates; Engineers; Architects ✓ Minimum 1 year of experience	☑	☐	☐	☐

Spain

Training Course Title	Provider(s)	Provided Certification or Qualification	Duration	Target Groups / Requirements	Face-to-Face Training	Practical Training	On Site Visits	Consulting after Course
Specialist in Integrated Management Systems: Quality, Environment, Energy and PRL	Instituto Superior del Medio Ambiente	Certification granted by Instituto Superior del Medio Ambiente	250 h	➢ University Graduates; Quality Technicians; Those responsible for the prevention of occupational hazards or for Integrated Management Systems; ✓ No requirements.	Online	☐	☐	☐

 **UK** 

Training Course Title	Provider(s)	Provided Certification or Qualification	Duration	Target Groups / Requirements	Face-to-Face Training	Practical Training	On Site Visits	Consulting after Course
Energy and Sustainable Building Design	De Montfort University Leicester	MSc/PG Dip/PG Cert Accredited by CIBSE and the Energy Institute	1 year	➢ Engineering; Physical Sciences; Mathematics and Architecture university graduates; ✓ Equivalent of a British Honours degree.	☑	☑	☐	☐
Advanced Professional Diploma in Energy Efficient Buildings, Systems and Refurbishment	Leeds Beckett University	Advanced Professional Diploma	3 months	➢ Any Professionals ✓ Second-class honours degree in a cognate subject or a Second-class honours degree in a non-cognate supported by work experience.	☑	☑	☐	☐
Energy Systems and Data Analytics MSc	University College London	MSc or PG Diploma and a PG Certificate	MSc FT 1 year MSc PT 2 years PG 9 month	➢ Bachelor's degree graduates ✓ Bachelor's degree	☑	☑	☐	☐
Carbon Management	The University of Edinburgh	PG Diploma or MSc	Not Defined	➢ Any Professionals ✓ A UK 2:1 honours degree, or its international equivalent	Online	☐	☐	☐
Level 1: Certificate in Energy Management Essentials	Energy Institute	Certificate in Energy Management Essentials	60 h	➢ Professionals from procurement, facilities management, finance, CSR and sustainability fields.	Online	☑	☐	☐

 **UK** 

Training Course Title	Provider(s)	Provided Certification or Qualification	Duration	Target Groups / Requirements	Face-to-Face Training	Practical Training	On Site Visits	Consulting after Course
		Allows attending the IRCA Auditors register		✓ No requirements.				
Level 2: Energy Management Professional	Energy Institute	Certification as *Energy Management Professional*	200 h	➢ Any Professionals. ✓ GCSE English and AS / A Level Math or Science, or equivalent by qualification or experience. ✓ Level 1 "Certificate in Energy Management Essentials" course or at least 2 years of experience in the field.	Online	☑	☐	☐
ISO 50001:2018 - Energy Management Systems - Introduction	Energy Institute	No Certification provided	1 Day	➢ Any Professionals that plan to be involved with ISO 5001. ✓ No requirements.	☑	☐	☐	☐
Certified Energy Manager "CEM"	SQT Training Ltd	CEM accreditation by AEE	6 days	➢ Engineering Managers, Energy Managers, Design Engineers, Facility Managers, Energy Consultants; Senior Technicians. ✓ Engineering degree with at least 3 years of work experience or several years of work experience depending on applicants educational background.	☑	☑	☐	☐
Certified Energy Auditor "CEA"	SQT Training Ltd	CEA accreditation by AEE	4 days	➢ Energy Management Professionals; Environmental Auditors ✓ Engineering or Architecture degree with at least 3 years of work	☑	☑	☐	☐

 **UK** 

Training Course Title	Provider(s)	Provided Certification or Qualification	Duration	Target Groups / Requirements	Face-to-Face Training	Practical Training	On Site Visits	Consulting after Course
				experience or several years of work experience depending on applicant's educational background.				
ISO 50001:2018 - Energy Management Systems – Internal Auditors	Energy Institute	No Specified	2 days	➢ Experienced Energy Auditors or Energy Managers ✓ No requirements.	☑	☐	☐	☐
ISO 50001:2018 - Energy Management Systems - Auditor Lead Auditor	Energy Institute	Certification accredited by IRCA reference No. A17574	5 days	➢ Experienced Energy Auditors or Energy Managers ✓ Basic knowledge of ISO 50001.	☑	☐	☐	☐
Level 3: Advanced Energy Manager	Energy Institute	Advanced Energy Manager (AEM)	140 h	➢ Energy Management Professionals; those who want to apply for the Chartered Energy Manager status ✓ Level 2: Energy Management Professional training course OR to be an AEE Certified Energy Manager (CEM) or at least 4 years of work experience.	☑	☑	☐	☐

4. Existing Certification Schemes /Professional Framework

4.1. National Certifications Schemes

Analysing the situation in each SMEmPower partner country has been concluded that the profession of Energy Auditor and Energy Manager is clearly defined by national legislation and defined competent national authorities (see Table 7) are responsible for proper monitoring and implementation in relation with EED Article 16, except Italy where the "Energy Auditor" is currently not a recognized professional since the corresponding European legislation has not been transposed yet. In Italy the role of the Energy Auditor is taken by the "Expert in Energy Management" identified by UNI CEI 11339: 2009.

Table 7: List of national competent authorities for energy auditors/managers professional framework in SMEmPower partner countries.

<table>
<tr><th>Cyprus</th><th>Germany</th><th>Greece</th><th>Italy</th></tr>
<tr><td rowspan="2">The Energy Service of the Ministry of Energy, Commerce & Industry</td><td>Federal Office for Economic Affairs and Export Control (BAFA)</td><td>Ministry of Environment & Energy</td><td>Italian Federation for the Rational Use of Energy (FIRE)</td></tr>
<tr><td>German Energy Agency (DENA)</td><td>The National Organization for the Certification of Qualifications & Vocational Guidance (EOPPEP)</td><td>ACCREDIA - The Italian Accreditation Body</td></tr>
<tr><th>Romania</th><th>Slovenia</th><th>Spain</th><th>UK</th></tr>
<tr><td rowspan="2">National Authority for Energy Regulations (ANRE)
⇓
Ministry of Energy</td><td rowspan="2">Ministry of Infrastructure</td><td>National Accreditation and Certification Entity (ENAC)</td><td>Energy Institute</td></tr>
<tr><td>Spanish Association for Standardization and Certification (AENOR)</td><td>United Kingdom Accreditation Service (UKAS)</td></tr>
</table>

❖ ***Energy Auditors***

Considering the certification of ***Energy Auditors*** in **Cyprus** and **Romania** the certification/accreditation procedure is strictly regulated by the national competent authority, energy professional needing to complete dedicated training courses and pass an examination procedure. These dedicated training courses could be provided by only higher educational institutions in **Romania** and/or accredited training providers in **Cyprus**.

In **Germany** there are several possible national certification schemes for energy professional in order to become energy auditors, all these certification schemes have to be approved and accredited by BAFA and DENA. A similar situation is in **Spain** where several international certification schemes are directly recognised, and additional national certification schemes could be accredited by the competent authorities ENAC and/or AENOR.

In **Greece** a qualification regime through a system of scoring is implemented with three accreditation levels for energy auditors. Energy professional could accumulate the required points (to become an Energy Auditor or to pass to a higher certification level) either by work experience or completion of several national/international certification schemes and training courses.

In **Italy** and **Slovenia** there are no clearly defined minimum requirements. Any energy professional that has a higher educational background, has completed some training courses and has work experience in the specific field, can apply for licence as energy auditor in Slovenia or EGE in Italy.

In the **UK** there are two possible certification schemes available for energy auditors: (1) the National one provided by the Energy Institute with the specific "Level 3: Advanced Energy Manager (AEM)" certification and (2) the International one provided by AEE with the specific "Certified Energy Auditor (CEA)" certification. Both of training courses are recognized in scoring scheme of **Greece** (for more information check section 4.2 and/or Annex 2).

The Table 8 presents a list of the most important national certification schemes or accepted training programmes and the corresponding certification/accreditation procedure for energy auditors in the SMEmPower partner countries (for more details about the corresponding training courses see Appendix 2).

*Table 8: List of **national certification** schemes for **energy auditors** in SMEmPower partner countries.*

Country	National Certification Scheme
 **Cyprus**	Energy Auditors Category A (for buildings, ports, airports and street lightning)
	Energy Auditors Category B (for industrial sites, processes, agricultural sites, etc.)
	Energy Auditors Category C (for transport, excluding, aviation and maritime)
 **Germany**	Audits + Consulting – Residential Buildings
	Consulting + Audits in SMEs
	Planning and Implementation – Residential Buildings
	Planning and Implementation – Non-Residential Buildings
 **Greece**	Qualification Regime through a System of Scoring is implemented with three accreditation levels for Energy Auditors.
 **Italy**	Training Course for Expert in Energy Management – UNI CEI 11339: 2009 - Industrial and Civil Sector
	Bases of Energy Management. Course for Energy Manager and Expert in Energy Management (EGE)
 **Romania**	Accredited Energy Auditor for Industry
	Accredited Energy Auditor for Buildings

Country	National Certification Scheme
Slovenia	✍ Seminar for Energy Auditors that Deal with Energy Management Systems compliant with ISO 50001
	✍ Seminar for Energy Auditors that Deal with Environmental Management Systems Compliant with ISO 14001
Spain	Expert in Energy Audits
	Energy Auditor in Industry and Building
	Energy Auditor in Building
UK	Level 3: Advanced Energy Auditor (AEM)

A generally valid certification procedure of energy auditors taken part in any of the above presented certification schemes is showed in *Figure 5:*

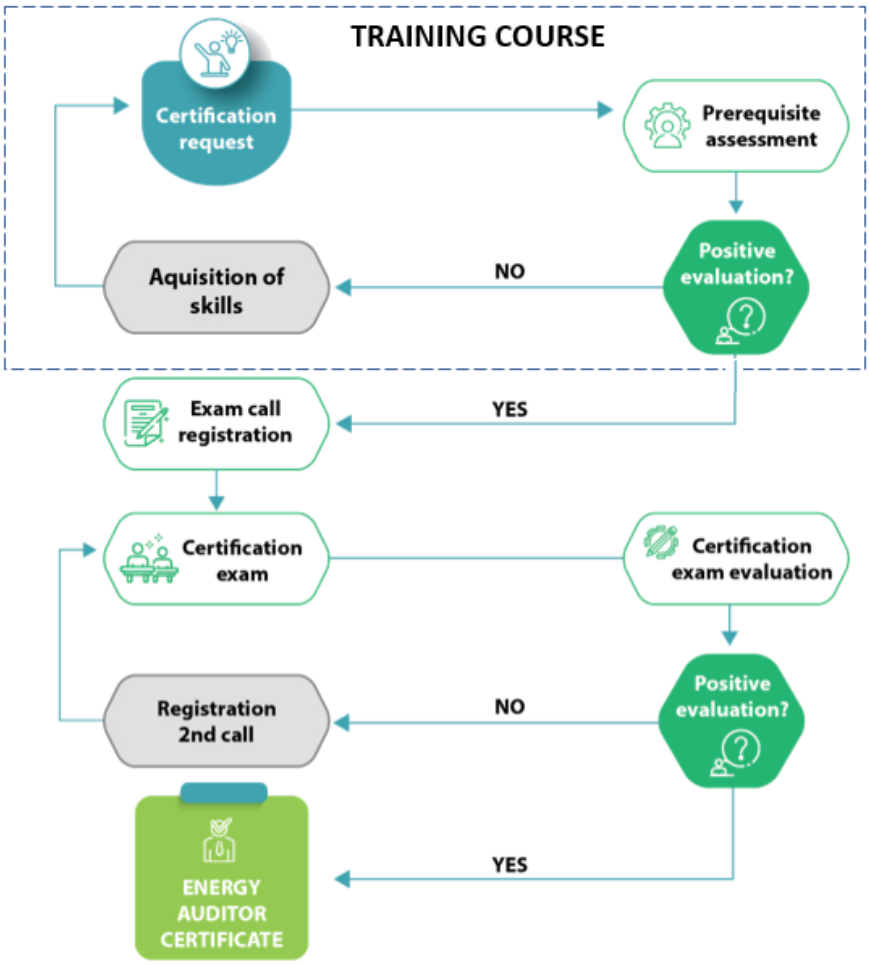


Figure 4. Certification/Accreditation procedure for energy auditors

❖ ***Energy Managers***

Regarding the ***Energy Manager*** certification of energy professional this is regulated in **Romania** and **Cyprus** through dedicated national certification schemes in **Romania** and through the EUREM international certification scheme in **Cyprus**.

In **Spain** and **Germany** there are several certifications schemes available for energy professional to become energy managers. All these schemes have to be periodically approved and accredited by the national competent authority.

In **Italy**, **Slovenia** and **Greece** there no limiting regulation regarding the Energy Manager profession. In **Greece** and **Slovenia** anybody with an engineering degree could become Energy Manager, while in **Italy** the companies could appoint any employee in the role of Energy Manager.

In the **UK** there are two possible certification schemes available for energy managers: the National one provided by the Energy Institute with the specific "Level 2: Energy Manager Professional" certification and the International one provided by AEE with the specific "Certified Energy Manager (CEM)" certification.

*Table 9: List of **national certification** schemes for **energy managers** in SMEmPower partner countries.*

Country	Certification Schemes
 **Cyprus**	EUREM – European Energy Manager
 **Romania**	Accredited Energy Manager for Industry
	Accredited Energy Manager for Local Communities
 **UK**	Level 2: Energy Manager Professional
 **Spain**  **Germany**	Several training courses available, no specific certification required (for available training courses see section 3.2 and/or Appendix 2)
 **Greece**  **Italy**  **Slovenia**	No Certification Required

4.2. International Certifications Schemes

Beside the dedicated energy auditor and/or energy manager certification schemes imposed by national legislation through the competent national authorities, there are several international certifications schemes available across Europe and Worldwide. The international certifications scheme related to the energy and building sector can be divided into certification of people and certification of energy management systems for companies and/or institutions (see Table 10). The

recognition and acceptance of these certification schemes at a local / national level depends on the specific country.

Table 10: Most common international certification schemes available across Europe

Certification schemes for persons	Certification schemes for Companies
✓ CEA – Certified Energy Auditor	✓ ISO 50001 – Certification of Energy Management Systems
✓ EUREM – European Energy Manager	✓ ISO 14001 – Certification of Environmental Management Systems
✓ CEM – Energy Certificate Manager	✓ ISO 52001 – Energy performance of Buildings - Indicators, requirements, ratings and certificates
✓ CMVP – Certified Measurement and Verification Professional	✓ ISO 52003 – Energy performance of Buildings - Overarching EPB assessment
✓ BEAP – Building Energy Assessment Professional	✓ ISO 52016 – Energy performance of Buildings - Energy needs for heating and cooling, internal temperatures and sensible and latent heat loads
✓ AEM – Advanced Energy Manager	

The above-mentioned certification schemes for people will be presented in detail below, while more information about specific courses related to the certifications schemes for companies/institutions are presented in Annex 2.

CEA – CERTIFIED ENERGY AUDITOR

The CEA is an international certification granted by the Association of Energy Engineers (AEE) and accredited by the American National Standards Institute (ANSI).

The objectives of this certification scheme is to certify the level of professionalism of those who perform energy audits; enhance the skills of energy auditors through ongoing refresher training; Identify people with the required knowledge and experience through an examination and validation of professional experience and ethical conduct.

The course consists in 14 topics related to International standard ANSI / ISO / IEC 17024 and ASHRAE Standard 211-2018: Introduction to energy audits; ASHRAE Level I. Walk-through audit; ASHRAE Level II. Energy audit; ASHRAE Level III. Investment grade audit; Audit support tools and software; Project financing; Fundamentals of energy; Facility systems and lighting; Fundamentals and Efficiency Improvements of HVAC + Systems Motors, Controls and Drives; Boilers; Compressed air and industrial processes; Operation and maintenance; Energy audit reports.

The certification programme is available through local training providers (see Table 11) ***in*** following European countries: ***France, Greece, Germany, Ireland, Italy, Romania, Spain, UK and Ukraine***. In **Spain** and **UK** this accreditation is officially recognized by the national competent authority as a viable accreditation scheme for energy auditors. In **Greece** and **Italy** is recognized as

one of the possible training programmes for energy auditors required in the national accreditation scheme for "energy auditors" (Greece) and "experts in energy management" (Italy). In **Romania** is only recognized and appreciated by energy professional associations and communities.

Table 11: Local training providers in Europe for AEE certification schemes

Country	Training Provider
France Germany Italy	Beelas Group (link)
Greece	INZEB – Institute of Zero Energy Buildings (link) in conjunction with the AEE Hellenic Chapter (link)
Ireland	AEE Ireland Chapter (link) in association with Target Energy (link)
Romania	AEE Cluj-Napoca Chapter (link)
Spain	AEE Training Spain (link)
UK	Target Energy (link) in conjunction with Vesma.com Limited (link)
Ukraine	AEE Ukraine Chapter (link)

In order ***to obtain the CEA certification***, one must verify having a security training of at least 2 hours and having participated in five commercial audits, all carried out in the last three years. In addition, it is necessary to have one of the following conditions: engineering / architecture degree of 4 years and related experience of more than 3 years; or, a 4-year unrelated university degree and related experience of more than 4 years; or, an associate degree of 2 years and 5 years of related experience; or, the Certified Energy Manager (CEM) certificate and related experience of more than 3 years; or, no qualifications/ degree and more than 10 years of experience related to energy auditing. If any of the above requirements are not met, the attendees can apply for a CEA-IT training certification, which is valid for 6 years.

AEM – Advanced Energy Manager

The AEM certification programme is provided by the Energy Institute. It is the national certification scheme for energy auditors in **UK** along with CEA.

It is a 10 days long advanced qualification course aiming to support experienced energy managers to further advance their careers by gaining the skills and knowledge required to function successfully at a senior level and be able to manage energy across a wide range of business areas, activities and parts of an organization.

The course consists in topics related to energy fundamentals; leadership for energy managers; energy procurement; behavioural change; strategic control systems; renewables; alternative supply strategies and heat recovery.

In **Greece** the Joint Ministerial Decision 175275/2018 - Government Gazette 1927/N/30-05-2018, granted 3 points for the AEM certification, to the system of scoring for professionals' qualifications of energy auditors in order for them to join classes B or C.

The certification is provided by the following assessment procedure:

- ✓ 50% Feasibility study for a project, which is presented to a panel;
- ✓ 50% Examination.

On successful completion of the course, students are awarded the Energy Institute Level 3: Advanced Energy Manager (AEM) qualification. This course will help fulfil many of the knowledge criteria required for becoming a Chartered energy manager.

EUREM – EUROPEAN ENERGY MANAGER

EUREM is a professional training scheme targeting employees who are responsible for energy issues within their enterprise / organization, and especially to those working in SMEs but also in Local Authorities. The ***objectives*** of the course are to provide participants all the necessary knowledge and skills to monitor and manage the energy efficiency of a facility or organization. Energy managers will be in the position to implement conservation measures, monitor energy consumption, assess business decisions for sustainability and seek out opportunities for increasing energy efficiency.

The EUREM training scheme has been started by the Nuremberg Chamber of Commerce in 1999. By 2017, its work had been subsidized through three European projects, adding more countries in a network that now is formed by **25 European** and **8 Worldwide countries**. A complete list of partner countries and training providers are available on (www.energymanager.eu).

Figure 5. List of European countries where the EUREM training course is/was provided

In **Cyprus** through the energy managers Regulation (RAA 344/2016) the EUREM certification received national recognition by the Energy Service of the MECI and now it is the official certification / accreditation scheme for energy professional in order to become "energy managers".

In **Greece** the Joint Ministerial Decision 175275/2018 - Government Gazette 1927/N/30-05-2018, granted 3 points for the EUREM certification, to the system of scoring for professionals' qualifications of energy auditors in order for them to join classes B or C. Since the first EUREM seminar in 2008 there are more than 100 EUREM Energy managers registered in Greece.

In **Germany** the EUREM is also recognized by BAFA and DEAN as an "energy manager" certification scheme.

In **Slovenia** through the certification provided by Jožef Stefan Institute - Energy Efficiency Centre to the attendees of the EUREM course, it is facilitated the achievement of a license form the Ministry of Infrastructure to practice as energy management and/or energy auditor.

The training course is related to the following topics: energy technical basics; project management; economic calculation; energy management | load management; energy and emissions trading; building energy requirements | energy efficient buildings; heating technology; process heat, steam, heat recovery; cogeneration of heat and power; ventilation and air conditioning; refrigeration technology; electrical engineering, electrical drives; lighting; compressed air; solar technology; energy from biomass; green IT tailored to the necessities of each country where the course is provided. The general length of the course is 6-8 months (for more specific details see Appendix B).

To obtain the EUREM certification a written examination of 2.5 hours is required, containing theoretical questions and exercises. Moreover, an energy project is assigned to each participant for the successful completion of the training program. In addition, in **Cyprus** in order to obtain the "energy manager" certification it is necessary that all the candidates to be engineers or graduates of Higher Technological Institute with at least two years of experience in energy issues within their business / organization.

CEM – CERTIFIED ENERGY MANAGER

The CEM is an international certification granted by the Association of Energy Engineers (AEE) and accredited by the American National Standards Institute (ANSI).

The objectives of this certification scheme are to obtain knowledge of the latest cost and energy saving techniques; To gain a thorough understanding of the latest energy management strategies; To obtain the necessary knowledge to take the CEM exam.

The training course is related to International standard ANSI / ISO / IEC 17024 and ASHRAE Standard 211-2018 and consists in: Introduction to AEE and CEM; Importance of energy management; Energy supply and prices; Energy audits; Instrumentation; Codes and standards; High-performance green buildings; Energy accounting and economy; Electric systems; Motors and variators; Lighting systems; Maintenance and commissioning; HVAC systems; Building enclosure; Building automation and control systems; Thermal storage systems; Boiler and steam systems; Cogeneration and renewable energies; Industrial systems; Savings contracts, and measurement and verification.

The certification programme is available through local training providers (see Table 11) ***in*** following European countries: ***France, Greece, Germany, Ireland, Italy, Romania, Spain, UK and Ukraine***. In **Spain** and **UK** this accreditation is officially recognized by the national competent authority as a viable accreditation scheme for energy auditors. In **Greece** it is recognized as one of the possible training programmes for energy auditors required in the national accreditation scheme for "energy auditors". In **Italy**, **Romania** and **Germany** is recognized and appreciated by energy professional associations.

To obtain the CEM certification, all candidates must attend a preparatory CEM training seminar conducted by an approved training provider, submit a CEM certification application, and pass an open book examination. In addition, it is necessary to have one of the following conditions: engineering / architecture degree and related working experience of more than 3 years; or an university degree in technology, environmental science, physics, or earth science and related experience of more than 4 years; or university degree in business (or related field) and related experience of more than 5 years; or an energy management associate degree and related experience of more than 6 years; or, no qualifications/ degree and more than 10 years of related experience. If any of the above requirements are not met, the attendees can apply for an EMIT (Energy Manager in Training) certification, which is valid for 6 years.

CMVP – Certified Measurement and Verification Professional

It is developed by AEE, in collaboration with the Efficiency Assessment Organization (EVO). Its purpose is to recognize those professionals who are most qualified in the area of energy efficiency; as well as increasing general professional standards within the field of Measurement and Verification.

It accredits technicians to issue "savings certificates". It consists of a protocol that allows to determine the consumption avoided by an energy improvement. It is not an accreditation to manage energy but to measure and certify energy consumption or its reduction.

The certification programme could be available through local AEE training providers (see Table 11).

BEAP – Building Energy Assessment Professional

The BEAP certification programme is provided by ASHRAE and is accredited by ANSI as conforming to a rigorous, internationally recognized standard (ISO 17024) for personnel certification programs. The ISO 17024 standard addresses certifying body legal status, management of confidentiality and impartiality, governance, recordkeeping, security, certification scheme requirements, appeals and complaints, among other requirements.

The Building Energy Assessment Professional (BEAP) certifications has been recognized by the U.S. Department of Energy (DOE) as meeting the Better Buildings Workforce Guidelines (BBWG).

In **Greece** the Joint Ministerial Decision 175275/2018 - Government Gazette 1927/N/30-05-2018, granted 3 points for the BEAP certification, to the system of scoring for professionals' qualifications of energy auditors in order for them to join classes B or C.

The BEAP certification validates competency to assess commercial building systems and site conditions, analyse and evaluate equipment and energy usage, and recommend strategies to optimize building resources utilization. The BEAP certification is integral to ASHRAE's Building

Energy Quotient (BuildingEQ) program by helping to ensure that only qualified practitioners can submit In Operation Workbooks to receive building ratings from ASHRAE. (for more information about the course could be find in Appendix 2).

The four (4) steps to ASHRAE certification are:

1) Study the Candidate Guidebook;
2) Complete the Application;
3) Schedule an Examination.
4) Renew the Certification. Each certification is renewable every three years.

The certification is provided only after successful participation to an examination process. Exams may be taken all year round at any one of over 300 testing centres in countries around the world. Certification exams assess competence in critical job tasks, and their related knowledge, skills and abilities.

Currently, there are no specific training courses organized in Greece to support potential applicants in pursuing such certification. However, the Greek ASHRAE chapter has organized in the past examinations for acquiring the BEAP certification in Greece.

5. Certification procedure according to the national law

In the following section an overview of the main steps towards certification/accreditation of the training programmes for energy auditors/managers in the SMEmPower Efficiency partners countries:

Cyprus

Main steps for the accreditation of educational programmes, training providers and trainers
• Training providers must be approved by the competent authority in order to be able to conduct training programs for energy auditors for the Categories A or/and B and C. Trainers' qualifications and/or certifications in energy auditing and their professional experience are also submitted and approved by the competent authority. Training programs are conducted by training providers authorized by the competent authority which is the Energy Service of the MECI. • The examination following the energy auditors/ managers training program is organized by an examination body that is approved by the competent authority as must meet the provisions of the relevant Regulation, in order to be able to conduct the examinations • The application form for the approval of both training providers and examination bodies is included in the ANNEX VI of the RAA 184/2012 and 344/2016. • The licensing of energy/ managers auditors and the training programmes are monitored by the Energy Auditors Committee that was set up to assist the competent authority with monitoring matters related to energy auditors.
Basic requirements
• The training of energy auditors includes theoretical and practical training. The ratio of theoretical vs practical training is set at 70:30. The theoretical training should cover the following topics, as

specified in ANNEX III of the Regulation (RAA 184/2012)

- The total duration of the training program must be at least 80 hours for energy auditors Category A, 80 hours for energy auditors Category B; and 32 hours for energy auditors in Category C. Energy Auditors that wish to be certified in both Category A and B must attend a total of at least 120 hours of training.
- In addition, the training providers should prove to the competent authority that they have the appropriate measuring instruments, equipment, software tools as well as infrastructure for carrying out the training for energy auditors.
- Regarding the examination bodies, the competent authority assesses their suitability based on the following criteria:
  - the ability to function as an examination body,
  - the examination procedures,
  - the measures taken to ensure the transparent procedures of exams,
  - the independence of the examination body from the training provider.

Requirements to maintain the accreditation

- There are no specific requirements to maintain the certification of training providers.

Authorities and bodies involved

- The Energy Service of the MECI

Greece

Main steps for the accreditation of educational programmes, training providers and trainers

The accreditation of educational programmes of training providers and trainers in Greece is mainly done through the National Organisation for the Certification of Qualifications & Vocational Guidance (EOPPEP).

- EOPPEP accredits and licenses providers of non-formal education encompassing initial and continuing vocational training upon legislated criteria for infrastructure, trainers & curricula, as well as enacted specifications for the organisation and operation of the provider, employed staff and provided services.
- Furthermore, EOPPEP is also responsible for the Accreditation/Certification procedures of
  - Vocational Training & Certification of Vocational Training Institute (IEK) Graduates
  - Certification of the teaching qualification of Trainers for Adults of non-formal education
  - Accreditation of Awarding Bodies
- Besides EOPPEP that targets mainly the Vocational Training, all HEIs in Greece have established Lifelong Learning Centers (LLC), which offer high quality education services to a wide range of people in the country. Lifelong Learning Courses aim to contribute in modernizing the educational system and in upgrading the quality of education, both at local but also at international level. Most of the courses offered are designed and supported by highly qualified academic staff, while the multidisciplinary character and the international dimension, through the invitation of distinguished lecturers from the international academia is highlighted. These courses are mainly accredited through the academic accreditation system and are considered as Level 6 courses (post-graduate).

Basic requirements

- The educational programmes are provided by: i) Higher Education Institutions and ii) Vocational

Training Centers (IEK). • The certification is made by National Organization for the Certification of Qualifications & Vocational Guidance (EOPPEP).
Requirements to maintain the accreditation
• The Higher Education Institutions can certify the provided courses by their LLCs with appropriate ECTS. This is done through a specific body inside each HEI. However, for professional accreditation, they have to apply to certain accreditation bodies like the EOPPEP. • The Vocational Training Centers need to apply to EOPPEP to accredit their courses and every two years to maintain a certain accreditation.
Authorities and bodies involved
• The National Organization for the Certification of Qualifications & Vocational Guidance (EOPPEP) • The Ministry of Environment and Energy • The Lifelong Learning Centers of Higher Education Institutions

Germany

Main steps for the accreditation of educational programmes, training providers and trainers
• Educational programmes must follow the guidelines set by the BAFA in order for graduates to be certified according to the national standard. • The training providers orient their courses according to these set guidelines, such as how many teaching units must be offered for the various certifications, and what the topical and content focus points need to be. If they believe they are offering a course whose graduates deserve certification they can apply to be put on the list (curated by DENA) of criteria fulfilling professional development courses.
Basic requirements
• Courses structured according to the BAFA requirements of mandatory minimum teaching units and content. • In order to be certified trainees must show they have achieved the base qualifications as laid out by BAFA: 1. Legal frameworks, 2. Building envelope in new and existing buildings, 3. Systems engineering and renewable energies in new and existing buildings, 4. Energy certificate, recommendations for modernization, economic efficiency, 5. Electrical engineering/lighting.
Requirements to maintain the accreditation
There are no requirements to maintain the accreditation.
Authorities and bodies involved
• Federal Office for Economic Affairs and Export Control (BAFA) • German Energy Agency (DENA)

Italy

Main steps for the accreditation of educational programmes, training providers and trainers
The accreditation of educational programmes of training providers and trainers in Italy is mainly done

through the accredited certification bodies. These bodies are accredited by ACCREDIA. ACCREDIA is the official accreditation authority, mutually recognised by other similar authorities in other EU countries.

Accredited certification bodies can:

- Recognise training courses for EGE exam preparation delivered by third companies;
- Recognise training courses delivered by third companies to provide credits necessary to maintain the EGE certification.

Besides, national and regional/local Chambers of Engineers can recognise training programs to provide the professional training credits necessary to maintain the membership.

Basic requirements

Generally, the accreditation is for educational programs, defining which specific requirements are necessary for trainers and training providers.

Requirements to maintain the accreditation

- Variables and defined by the accrediting body.

Authorities and bodies involved

- Universities
- Regional authorities
- Certification bodies
- Italian accreditation body (ACCREDIA)

Romania

Main steps for the accreditation of educational programmes, training providers and trainers

For a public technical university with a provided establishment of a permanent nature, it is required to provide the following documentation:

- Document accrediting the right of use: ownership, lease, transfer of use and usufruct of the centre, facilities, equipment, workshops or practice fields of the centre or entity (with a minimum duration of one year), indicating the temporary and hourly availability of the centre.
- Power of attorney attesting to the powers of representation of the signatory of the request to act on behalf of the requesting entity.
- Identification National Identity Document of the person acting on behalf of the legal entity applicant (in the case of not granting authorization application).
- The proposed curricula for the E&T proposed courses.
- The academic staff with CVs to be involved in the E&T courses.

Basic requirements

The basic requirements for administering as an educational institution:

- To be a Technical University;
- To ensure the required training content according to the course domain;
- To provide the necessary training infrastructure, facilities, and equipment;
- Trainees need to meet some base requirements, regarding their previous qualification: a university degree or certification as a technician in an appropriate field

Requirements to maintain the accreditation
There are no requirements to maintain the accreditation.
Authorities and bodies involved
• The authorities involved in the accreditation procedure are: • ANRE up to January 2020 and present day the Ministry responsible for Energy for the industrial energy auditors, industrial energy managers, local communities energy managers; • Ministry responsible for Public Administration and Development for the building energy auditors; • Ministry of Education for all curriculum contents for all the above E&T courses.

Slovenia

Main steps for the accreditation of educational programmes, training providers and trainers
According to the Official Gazette of The Republic of Slovenia, there are Measures for the accreditation and external evaluation of educational programmes, by educational institutions, where main steps are given by standards that must be provided: • The educational programmes are evaluated by their content and offer attendees comprehensive knowledge, concerning the given subject and allowing the attendees to reach given competences or results. • The educational programmes are defined, based on the programme name, its purpose, content and label (area/discipline). • The educational programmes are connected with the area in which the Institution that operates also resides. • The content of educational programmes is thoroughly defined (the implementation of the course, material conditions and its lecturers/scientists). • The educational programmes allow the participants to exercise their rights and obligations, define protocols for the admission process and define the title, awarded after its completion. • The accreditation process must be formally endorsed, approved and accepted by Slovenian Quality Assurance Agency for Higher Education and Ministry of Education, Science and Sport of The Republic of Slovenia. • The procedure/sheet (example) of the accreditation of educational programmes (from University of Maribor) is available at (link).
Basic requirements
The basic requirements for administering as an educational institution: • The institutions successfully operate in Slovenian and international environment by achieving organizational and implementational goals and maintaining quality activities and its development. • Internal structure of the institution ensures the cooperation of educational and management staff, external experts, scientists, students and others with managing and developing institutions' activities. • The lecturers provide all the standards, given at (link). • The attendees are in sufficient numbers, so that the educational programmes are organized. • The material conditions are met with all the standards, given at (link).
Requirements to maintain the accreditation
• External evaluation of the educational programme is carried out.

- The institutions continue to successfully operate in Slovenian and international environment by achieving organizational and implementational goals and maintaining quality activities and its development.
- The lecturers maintain to provide all the standards, given at (link).
- The attendees are in sufficient numbers, so that educational programmes continue.
- The material conditions are maintained with all the standards, given in (link).
- The educational programme is upgraded (by content or structurally), if necessary.
- The internal structure of the institution continues to ensure the cooperation of educational and management staff, external experts, scientists, students and others with managing and developing institutions' activities.

Authorities and bodies involved

- Slovenian Quality Assurance Agency for Higher Education
- Ministry of Education, Science and Sport of The Republic of Slovenia
- Institutions mentioned in Annex 2 that organize programme courses and seminars

Spain

Main steps for the accreditation of educational programmes, training providers and trainers

- Educational/training programs could be provided only accredited, registered or enabled training centres in the national Registry. In Spain is clearly defined and regulated the difference between accredited, registered, and enabled training centres:
- The accreditation procedure form both entities ENAC and AENOR is similar, it requires that an application form that includes legal commitments to be filled in and the accreditation fee imposed by the accrediting entity to be accepted. The accreditation is realised through an on-site audit carried out by the accrediting entity. During this audit the audit team verifies if the activity that has to be accredited complies with the international regulations that best suit that specific activity and all the national regulations regarding hygienic, acoustic conditions of habitability and safety required by the training facilities are respected. The audit ends with a final meeting where the audit report is presented and further recommendations and/or requirements are done for the training centre that seeks for accreditation.
- Once the accreditation is obtained it is valid indefinitely as long as the activities to maintain the accreditation are successfully completed. For these accrediting entity (ENAC or AENOR) regularly evaluates accredited entities, verifying that they maintain their technical competence through follow-up visits (at least once in 18 months) and re-evaluation audits (after maximum 4 years after the previous audit).
- These accreditation procedures can be followed by: Companies that develop training programs for their workers or for unemployed with a commitment to insertion; Integrated vocational training centres, privately owned; Public or private training centres or entities.

Basic requirements

- To meet hygienic, acoustic conditions of habitability and safety required by the legislation in force.
- To comply with the requirements for occupational risk prevention and, specifically, to have a Prevention Plan for these risks.
- The minimum requirements for spaces, facilities and equipment are set out in the training programs of the training specialties or in the Royal Decrees that regulate each of the professional certificates.

- To have staff enough to ensure administrative management, monitoring and maintenance tasks.
- The classrooms must be equipped with the necessary furniture in addition to the auxiliary elements: tables and seats for PC and height-adjustable and swivel chairs with combined seat and back adjustment.
- The equipment and computer programs must be updated and correspond to those in use at any given time in companies in the productive sectors, as well as being in perfect condition, and must always guarantee fast and quality operation.

Requirements to maintain the accreditation

- The accreditation is valid indefinitely as long as the activities to maintain the accreditation are successfully completed.
- ENAC regularly evaluates accredited entities, verifying that they maintain their technical competence through follow-up visits and re-evaluation audits.
- The first follow-up visit is made no later than one year after accreditation is granted.
- The following follow-ups are carried out no later than 18 months from the last visit, notifying the entity in advance of the date.
- After a maximum of 4 years from the initial date of accreditation, the entity's competence is re-evaluated by performing an audit equivalent to the initial one.
- The next re-evaluation Audit will be scheduled no later than 5 years form the previous one.

Authorities and bodies involved

- Government of Spain; Ministry of Science and Technology;
- National Entity of Accreditation and Certification ENAC;
- AENOR;
- International Protocol for Verification and Measurement IPMVP;.

UK

Main steps for the accreditation of educational programmes, training providers and trainers

The following steps are needed to get accreditation:

- The organisation needs to familiarise themselves with the clauses in the relevant accreditation standard(s) and identify what they have in relation to what the standard requires they have in place and to carry out what is missing. That is carry out a gap analysis to identify certain areas that they need to address. In addition, all organisations need to be familiar with the appropriate standards, which can be purchased from the British Standards Institute.
- Apply for accreditation by filling an application form which lists in detail the supporting information that you are required to submit with your application, including your Quality Manual and proof of legal status, for it to be processed without delay.
- Arrange for a pre-arrangement visit. UKAS recommends a pre-assessment visit by the UKAS Assessment Manager (and possibly a technical assessor). This visit addresses the scope of accreditation requested and will normally involve between 1 and 4 man-days work. It is designed to confirm the organisation's readiness for full assessment.
- Once the organisation has addressed any issues raised during the pre-assessment visit, the initial assessment is the first formal assessment. This will be conducted by a Lead Assessor supported, as necessary, by technical assessors with the expertise to cover the scope of the application
- If UKAS have any findings, the organisation will have approximately 12 to provide suitable evidence to the Assessment Manager that they have been addressed. Once any mandatory findings have

been satisfactorily cleared, the Assessment Manager will submit their recommendation to an independent Decision-maker within UKAS.
Basic requirements
• To ensure the required training content according to the course domain; • To provide the necessary training infrastructure, facilities, and equipment; • Trainees need to meet some base requirements, regarding their previous qualification: a university degree or certification as a technician in an appropriate field
Requirements to maintain the accreditation
The accreditation will be confirmed on an annual basis by surveillance visits, with a full re-assessment every fourth year. The first surveillance visit takes place 6 months after the Grant of Accreditation.
Authorities and bodies involved
• University's Quality Assurance Committee and Education Committee • United Kingdom Accreditation Service (UKAS)

6. Identified gaps between current certification schemes for energy auditors/managers and market requirements

One **main gap** between training courses and the market is created by the fact that, only few potential energy auditors have attended highly specialized educational courses during their studies (undergraduate and postgraduate). In many countries, engineers, or graduate engineers of Technological Education Institutions, or engineers from educational systems of other countries who have obtained similar qualifications can become energy auditors in post-graduate courses. Thus, there is not a harmonised system of qualification approval among member states and therefore the **mutual recognition** remains a **problem unsolved**.

There are also different requirements for entry requirements for energy auditors; for example, in **Cyprus**, only engineers that are licensed by the Cyprus Scientific and Technical Chamber (ETEK) can become Energy Auditor. Similar situation is found in **Romania**, limiting the engineering profiles.

In fact, a rough analysis of the curriculum of Technical Universities or Technological Education Institutions, has shown that there are a few courses that are related to energy savings/efficiency. The problem identified is that the energy auditing is a multi-disciplinary topic including electrical, mechanical, civil engineering and architecture, and, although all Engineering disciplines can be registered in the Energy Auditor Registry, not all of them have attended relevant educational modules during their undergraduate studies.

Taking all of these into account, it is required an in-depth multidisciplinary approach of the new harmonised educational/training courses, in order the qualified engineers to be able to meet the expectations of a growing market demand.

Also, another problem identified is about the duration of the training courses (6-8 months EUREM program in **Slovenia**), so, many SME's are not in the position for allowing staff to participate in such

lengthy trainings. Shorter training courses are, therefore, more suitable and should be provided **in non-working hours,** and maybe during the weekends. Thus, the **training courses duration** should be carefully selected.

The energy efficiency topic is very dynamic. The training courses cover a wide range in-depth knowledge in vast fields. Refreshment courses should be organised by the training providers every 3 to 5 years. This is a common gap identified in all the participating countries, that relevant legislation/regulations do not include provisions for refreshment courses and their duration. Although the market of energy audits is strongly regulated, the quality of energy audit services is fluctuating. This might be the reason the Regulation provisions should have included **obligatory refreshment courses**, every three years, as legislation, technology and electricity market change rapidly. Energy auditor shall maintain the qualification through an update and improvement their specific skills and knowledge. Verification of the qualification requirements to keep the license should be based on participation in conferences/seminars and participation in energy audits, including technical and economic planning of the interventions and monitoring.

Most of the available refreshment courses for energy professionals lead to uncertainty about the adequacy of these trainings to their professional profile and their usefulness in the labour market. Many courses offer too much theoretical training. Instead of this, they should include more practical training hours, to gain knowledge about: equipment used for energy audits, financial viability of measures or life cycle assessment.

The **course fee** is another important identified gap, because all training programs or seminars have courses' fees ranging from **250€ to 2.000€ + VAT.** For the majority of SME's (especially for small & micro SMEs) cannot afford this cost in combination with the time of absence of a staff member to attend the lengthy training courses. Therefore, the course cost should be proportionate to the size of SME and /or co-financed by VET national authorities.

The most common complaints regarding energy audits are related also with the communication of outcomes to the client. Therefore, training courses should put more emphasis on how outcomes are communicated to the client, how to make recommendations in less technical terms to be more easily understood by nontechnical CEOs or managers. This aspect will strongly influence the implementation of the proposed measures in energy audits. More focus is needed on participants' needs, regarding the implementation of (technical or organizational) measures for increasing energy efficiency. Some companies may require only knowledge on some topics like legislative requirements to apply for national/EU funds or like energy optimization of production lines.

7. Conclusions

The Energy Efficiency Directive (EED) gives energy audits and energy management schemes a substantial role to play in improving energy efficiency in the end-use sectors, as provided in Article 8. The transposition of this directive into national legislation defines the **Energy Auditor** (or a local equivalent, like EGE in Italy) as a professional specialized in performing energy surveys, measurements and energy balances calculation, to adequately develop an Energy Efficiency Action Plan.

In almost all the participating countries, obtaining the qualification (license) of a registered **energy auditor**, the certification requires an obligatory training and qualifying exam, clearly defined by national regulations. Except for **Italy**, where the Energy auditor is currently not a recognized professional since the corresponding European legislation has not been transposed in Italy. In Italy, the role of an energy auditor is taken by the “Expert in Energy Management (EGE)". Regarding the **energy manager** profession, in all mentioned states, the national rules are not so clearly defined (except **Cyprus & Romania**), and no minimum requirements and qualifications are needed. To have a University degree in select subjects or a technical vocational training, in most of the countries, is enough.
The total number of qualified energy auditors/energy managers does not depend on the size of the country. In the SMEmpower participating countries the number of qualified energy auditors/managers vary between 0,01 (UK) and 0,12 (Slovenia) per 1000 inhabitants. The number of available energy professionals vary between 0,23 (UK) and 3,50 (Romania) per 1000 SMEs.

Some countries (**Germany, Greece, Cyprus, Romania**) have a designated Ministry or National Agency that adopts, implements and monitors strict regulations covering all aspects of course organization e.g. the content/topics, training providers, trainers, entry qualifications, type of training provision (blended or not), etc. etc.). In some other countries (**Slovenia, Spain, Italy**) there are no specific regulations and the approval of training courses and this is done by public or private entities with recognized competences in the field (universities, other higher education bodies).

It is required an in-depth multidisciplinary approach of the new **harmonised educational/training** courses, in order the qualified engineers to be able to meet the expectations of a growing market demand and to allow **mutual recognition**.

The energy efficiency topic is very dynamic. The training courses cover a wide range in-depth knowledge in vast fields. Refreshment courses should be organised by the training providers every 3 to 5 years. This is a common gap identified in all the participating countries, that relevant legislation/regulations do not include provisions for refreshment courses and their duration. The **course fee** is another important identified gap, because all training programs or seminars have courses’ fees ranging from **250€ to 2.000€ + VAT, as well as the lengthy training courses and the time schedules.** Therefore, the course cost should be proportionate to the size of SME and /or co-financed by VET national authorities.

Based on the comparative analysis carried out in this report it is highlighted a major gap between energy professionals training courses and the specific market requirements, is the lack of specialized educational courses at undergraduate level. Additionally, most of the available training programmes present a lack of modules e.g. onsite visits, practical case studies, and M&T/M&V instrumentation knowledge.

In most of the analysed countries (Cyprus, Germany, Greece, Italy, Romania, Slovenia, Spain and the UK), SMEs are not motivated by national regulations and/or support schemes to perform energy audits.

Taking all the above into account, the training courses that will be developed within the SMEmPower Efficiency project (WP3) aim to provide an in-depth multidisciplinary harmonised approach, in order to meet the expectations of a fast growing market.

The developed training courses will provide solutions for the following aspects:

- differences between participants such as: technical profile, practical experience, level of qualification (some of them are already PhD and other only diploma);
- lack of specific knowledge regarding various industrial technologies and mainly energy efficiency technologies, indicators, software, energy measurement procedures and tools;
- lack of specific knowledge in economic evaluation of energy efficiency impact;
- lack of practical training - onsite visits and practical case studies during trainings;
- lack of specific knowledge in basic energy management and communication/cooperation/ and how to persuade top management;
- limited opportunities to upgrade their basic technical profile and information about recent energy legislation, many years after graduation.

The educational and training programs that will develop in SMEmPower Efficiency project will complement the European Commission's effort to promote energy efficiency actions also among small and medium enterprises (SMEs) in EU member states, and ensure the use of high quality, cost-effective energy audits and energy management systems to final customers.

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Annex 1. Main objectives of the comparative analysis

The main objectives of the comparative analysis and the collected information for this report.

Objective	The information collected from project partners
Objective 1: Identification of existing training courses, materials and tools in each country	**1.1. Overview of training courses** - Which are the bodies that can organize training courses? - What are the main requirements to organize or attend a training course?
	1.2. Analytic description of existing training courses on energy professionals - Description of the current training courses related to energy auditors and managers in each country.
Objective 2: Identifying the existing Professional Certification Schemes	**2.1. Professional Framework** - Is energy auditors/managers professional profile clearly defined by national authorities/guilds/qualifications/certification? - What are the minimum requirements to obtain license to practice (if needed)? - What about professional rights? - What are the professional unions/associations involved? - What is the typical education/experience/skill/qualification of energy auditors/managers? - Approximately how many qualified/certified energy auditors/managers are there in your country?
	2.2. Availability of certification schemes for energy auditor/ manager - Which are the certification schemes that offer certification for energy auditors/managers? - Are these schemes accredited, if so by which accreditation body? - What are the key competencies/requirements included in these schemes? - Do the current existing courses consist a satisfying parameter for accreditation or are further actions required (examination etc.)?
	2.3. Identified gaps between current educational energy professionals related courses and market requirements
Objective 3: Accreditation procedure according to national law in each country	**Accreditation procedure according to the national law** - Which are the main steps for the accreditation of educational programmes, training providers and trainers? - Which are the basic requirements for an accreditation? - Which are the requirements to maintain the accreditation? - Which are the authorities and bodies involved?

Annex 2. Existing training course description tables, in SMEmPower partner countries

❖ Cyprus

Training Course Title:	ENERGY AUDITORS CATEGORIES A & B
Training Provider Name:	**CYPRUS ENERGY AGENCY**
COURSE OVERVIEW	
Aim (scope of the training)	Training course for candidates Energy Auditors for obtaining a license in **Category A** - Energy Audits in Buildings and **Category B** - Energy Audits in industrial sites and processes, agricultural sites
Level/Type of training	Training seminar
Target groups	Engineers only
Entry requirements	Engineers licensed by the Cyprus Scientific and Technical Chamber (ETEK)
Qualifications/Certification obtained	The qualified trainees obtain a certificate of attendance, which is prerequisite for candidates to give exams
Duration/Structure	Category A: Total 82 hours (theoretical training is 58 hours and practical training is 24 hours); Category A&B: Total 128 hours (theoretical training is 89 hours and practical training is 39 hours); The attendance is obligatory
Course Fee	Category A: 750 euros plus VAT; Category A&B: 1.050 euros plus VAT
EDUCATIONAL ISSUES	
Course Syllabus - Topics	Basic Principles of Energy; National/European Legislation; Methodology for carrying out energy audits; Water saving and energy audits, energy accounting and economic analysis, energy accounting and economic analysis (Industry); Energy Software and tools; Measurements and instruments in energy audits; Maintenance & Energy Controls in Industry; Preparation of Reports; Analysis of building envelops; Cooling systems and cooling loads calculations; Lighting systems & energy saving; Electrical systems; Industrial lighting systems; Building Automation & Control Systems; Practical training for industrial electrical systems; Practical training for lighting; Air conditioning - ventilation systems; Heating and steam systems; Cogeneration CHP systems; Hot water systems; Application of RES technologies in buildings; Industrial Systems; Practical training in mechanical equipment in buildings (case study); Practical training for the building envelops; Practical training - on-site energy audit in industrial building.
Practical training	Yes
Assessment	Exams organized by examination body approved by the competent authority, which is the Energy Service of Cyprus, Ministry of Energy, Commerce & Industry
Training method	In classroom: face-to-face training and practical training (on-site visits)
Training material provided	PowerPoint slides, bibliography
Training facilities	Classroom style
INFORMATION ABOUT THE TRAINERS / TRAINING PROVIDERS	
Trainers Profile	Engineering academic background
Certified trainers (Yes/No)	Yes. Must be approved by the competent authority, Energy Service (MECI) and if the training is financially supported by the HRDA the trainers be certified by the HRDA as well.
Are the training courses /training	The training course and the training providers must be approved by the

providers accredited/certified by a credible authority / certification body?	Energy Service of the MECI; Also, the Category A is certified with ISO17024
ADDITIONAL INFORMATION	
Contacts	Cyprus Energy Agency, tel. 00357 22667716
Course frequency	Once a year (2 courses in 2013 and 2014, 1 course in 2015 and 2017)
No of trainees per year	52 candidates were trained in 2013, 29 in 2014, 10 in 2015 and 9 in 2017
No of trainees per course	Average 17 candidates were trained per course
Location (in case of class training method)	Nicosia, Cyprus
Training or consulting services after the Course	No

Training Course Title:	**ENERGY AUDITORS CATEGORY C**
Training Provider Name:	**CYPRUS ENERGY AGENCY**
COURSE OVERVIEW	
Aim (scope of the training)	Training course for candidates Energy Auditors for obtaining a license in **Category C –** Transport (excluding aviation and maritime).
Level/Type of training	Training seminar
Target groups	Engineers only
Entry requirements	Engineers licensed by the Cyprus Scientific and Technical Chamber (ETEK)
Qualifications/Certification obtained	The qualified trainees obtain a certificate of attendance, which is prerequisite for candidates to give exams
Duration/Structure	Total 36 hours (theoretical training is 26 hours and practical training 10 hours); The attendance is obligatory
Course Fee	400 euros plus VAT
EDUCATIONAL ISSUES	
Course Syllabus - Topics	Measurement Units and cost of energy; Methodology for carrying out an energy audit in transport; Comparative analysis of factors affecting energy efficiency in the transport sector; Engine components and auxiliary systems; Gaseous pollution; Software and tools; Measurements and instruments in energy audits; Maintenance & Energy Audits; Energy accounting and economic analysis; Preparation of Reports; Practical training – on-site energy audit in transport sector (Enterprise with energy-intensive fleet); Practical training –MOT test for vehicles; Inspection processes; Practical training – Use of software to save energy on transport sector
Practical training	Yes
Assessment	Exams organized by examination body approved by the competent authority, which is the Energy Service of Cyprus, Ministry of Energy, Commerce & Industry
Training method	In classroom: face-to-face training and practical training (on-site visits)
Training material provided	PowerPoint slides, bibliography
Training facilities	Classroom style
INFORMATION ABOUT THE TRAINERS / TRAINING PROVIDERS	
Trainers Profile	Engineering academic background
Certified trainers (Yes / no)	Yes. Must be approved by the competent authority, Energy Service (MECI) and if the training is financially supported by the HRDA the trainers must be certified by the HRDA as well.
Are the training courses /training providers accredited/certified by a credible authority / certification body?	The training course and the training providers must be approved by the Energy Service of the MECI.
ADDITIONAL INFORMATION	

Contacts	Cyprus Energy Agency, tel. 00357 22667716
Course frequency	1 course in 2016
No of trainees per year	15 candidates were trained
No of trainees per course	15 candidates were trained
Location (in case of class training method)	Nicosia, Cyprus
Training or consulting services after the Course	No

Training Course Title:	**ENERGY AUDITORS CATEGORIES A & B**
Training Provider Name:	**FREDERICK UNIVERSITY**
COURSE OVERVIEW	
Aim (scope of the training)	Training course for candidates Energy Auditors for obtaining a license in **Category A** - Energy Audits in Buildings and **Category B** - Energy Audits in industrial sites and processes, agricultural sites
Level/Type of training	Training seminar
Target groups	Engineers only
Entry requirements	Engineers licensed by the Cyprus Scientific and Technical Chamber (ETEK)
Qualifications/Certification obtained	The qualified trainees obtain a certificate of attendance, which is prerequisite for candidates to give exams
Duration/Structure	Category A&B: Total 120 hours (theoretical training is 75 hours and practical training 45 hours) Attetance is obligatory
Course Fee	Category A&B: 1.200 euros plus VAT
EDUCATIONAL ISSUES	
Course Syllabus - Topics	Legislation on Energy saving, energy efficiency and RES; Methodology for carrying out energy audits; Buildings envelope; European and international standards for energy audits; Water saving and energy audits; Building automation, control systems; Energy accounting and economic analysis; RES application in buildings, industries; Maintenance and energy audits; Cogeneration CHP systems; Industrial systems; Lighting systems; Ventilation systems; Heating and steam systems; Software and tools; Air conditioning; Hot water systems; Measurement and instruments in energy audits; Preparation of energy audits reports; Practical training
Practical training	Yes
Assessment	Exams organized by examination body approved by the competent authority, which is the Energy Service of Cyprus, Ministry of Energy, Commerce & Industry
Training method	In classroom: face-to-face training and practical training (on-site visits)
Training material provided	PowerPoint slides, bibliography
Training facilities	Classroom style
INFORMATION ABOUT THE TRAINERS / TRAINING PROVIDERS	
Trainers Profile	Engineering academic background
Certified trainers (Yes / no)	Yes. Must be approved by the competent authority, Energy Service (MECI) and if the training is financially supported by the HRDA the trainers must be certified by the HRDA as well.

Are the training courses /training providers accredited/certified by a credible authority / certification body?	The training course and the training providers must be approved by the Energy Service of the MECI
ADDITIONAL INFORMATION	
Contacts	Frederick University, tel. 00357 22394489
Course frequency	5 courses from 2013 to date
No of trainees per year	Approximately 75 candidates were trained
No of trainees per course	Average 15 candidates were trained per course
Location (in case of class training method)	Nicosia, Cyprus
Training or consulting services after the Course	No

Training Course Title:	**ENERGY AUDITORS CATEGORY C**
Training Provider Name:	**FREDERICK UNIVERSITY**
COURSE OVERVIEW	
Aim (scope of the training)	Training course for candidates Energy Auditors for obtaining a license in **Category C –** Transport (excluding aviation and maritime).
Level/Type of training	Training seminar
Target groups	Engineers only
Entry requirements	Engineers licensed by the Cyprus Scientific and Technical Chamber (ETEK)
Qualifications/Certification obtained	The qualified trainees obtain a certificate of attendance, which is prerequisite for candidates to give exams
Duration/Structure	Total 32 hours
Course Fee	400 euros + VAT
EDUCATIONAL ISSUES	
Course Syllabus – Topics	Measurement Units and cost of energy; Methodology for carrying out an energy audit in transport; Comparative analysis of factors affecting energy efficiency in the transport sector; Engine components and auxiliary systems; Gaseous pollution; Software and tools; Measurements and instruments in energy audits; Maintenance & Energy Audits; Energy accounting and economic analysis; Preparation of Reports; Practical training – on-site energy audit in transport sector (Enterprise with energy-intensive fleet); Practical training –MOT test for vehicles, Inspection processes; Practical training – Use of software to save energy on transport sector.
Practical training	Yes
Assessment	Exams organized by examination body approved by the competent authority, which is the Energy Service of Cyprus, Ministry of Energy, Commerce & Industry
Training method	In classes: face-to-face training and practical training (on-site visits)
Training material provided	PowerPoint slides, bibliography
Training facilities	Classroom style
INFORMATION ABOUT THE TRAINERS / TRAINING PROVIDERS	

Trainers Profile	Engineering academic background
Certified trainers (Yes / no)	Yes. Must be approved by the competent authority, Energy Service (MECI) and if the training is financially supported by the HRDA the trainers must be certified by the HRDA as well.
Are the training courses /training providers accredited/certified by a credible authority / certification body?	The training course and the training providers must be approved by the Energy Service of the MECI
ADDITIONAL INFORMATION	
Contacts	Frederick University, tel. 00357 22394489
Course frequency	1 course in 2015
No of trainees per year	12 candidates were trained
No of trainees per course	12 candidates were trained
Location (in case of class training method)	Nicosia, Cyprus
Training or consulting services after the Course	No

Training Course Title:	**EUROPEAN ENERGY MANANGERS (EUREM)**
Training Provider Name:	**CYPRUS ENERGY AGENCY**
COURSE OVERVIEW	
Aim (scope of the training)	The aim of the training course is to provide participants with all the necessary knowledge and skills to monitor and manage the energy efficiency of a facility or organization. Energy managers will be in the position to implement conservation measures, monitor energy consumption, assess business decisions for sustainability and seek out opportunities for increasing energy efficiency.
Level/Type of training	Training seminar
Target groups	To employees who are responsible for energy issues within their enterprise / organization, and especially to those working in SMEs but also in Local Authorities.
Entry requirements	Engineers or graduates of Higher Technological Institute with at least two years of experience in energy issues within their business / organization.
Qualifications/Certification obtained	Certificates will only be issued when candidates complete their theoretical courses, complete the practical work (case study) and pass the exams. The course started within the IEE project EUREMplus.
Duration/Structure	Total 90 hours
Course Fee	1.350 euros plus VAT
EDUCATIONAL ISSUES	
Course Syllabus – Topics	National energy efficiency legislation; Basic principles of energy; Project financial analysis / management; Energy data management; Energy requirements of buildings; Lighting; Thermal processes, steam systems, heat recovery; Heating; Cooling; Air conditioning; Cogeneration CHP systems; Electrical systems; Geothermal; ISO 50001 standard; Compressed air; Solar Energy - Thermal Solar; Solar Energy – Photovoltaics; Biomass, Biogas (anaerobic digestion); Biomass (combustion); IT equipment (Green IT); Building shell insulation ; Building energy performance certificate; Energy labelling of energy related products; Measures to change the behaviour of users for rational use of energy; Energy Service Companies (ESCOs) and Energy Efficiency Contracts
Practical training	Yes
Assessment	Written examinations after the completion of the theoretical lectures. The

	minimum pass grade for the exams is 50%.
Training method	In classes: face-to-face training and practical training (on-site visits)
Training material provided	PowerPoint slides and trainee's handbook
Training facilities	Classroom style
INFORMATION ABOUT THE TRAINERS / TRAINING PROVIDERS	
Trainers Profile	Engineering academic background or other degrees relevant to work
Certified trainers (Yes / no)	Yes. Must be certified by the Human Recourses Development Authority (HRDA)
Are the training courses /training providers accredited/certified by a credible authority / certification body?	The training course is certified by the Energy Service of the Ministry of Energy, Commerce and Industry.
ADDITIONAL INFORMATION	
Contacts	Cyprus Energy Agency, tel. 00357 22667716
Course frequency	3 courses from 2014 to date
No of trainees per year	In total 29 candidates were trained
No of trainees per course	Average 10 candidates were trained per course
Location (in case of class training method)	Nicosia, Cyprus
Training or consulting services after the Course	No

Training Course Title:	**ISO 50001 ENERGY MANAGEMENT SYSTEM**
Training Provider Name:	**CYPRUS CERTIFICATION COMPANY (CCC)**
COURSE OVERVIEW	
Aim (scope of the training)	Upon completion of the Program participants will have the knowledge to design and implement Energy Management Systems based on the international standard ISO 50001.
Level/Type of training	Training seminar
Target groups	The program is mainly targeted at companies / organizations that are already implementing or are preparing to implement an Energy Management System.
Entry requirements	Mechanical Engineers, Electrical engineers, Energy Managers, Energy Consultants, Environmental Management Officers, Internal auditors, Managerial staff, Certification body inspectors
Qualifications/Certification obtained	Certificate approved by the International Certification Network (IQNet)
Duration/Structure	Total 14 hours
Course Fee	175 euros plus VAT
EDUCATIONAL ISSUES	
Course Syllabus - Topics	Introduction to Energy Management; Energy Management Standards and Regulations; European Energy Management Policy; Legislative framework in Cyprus; Analysis of ISO 50001: 2018 Standard; General Standard Requirements; System Documentation Requirements; Roles and Responsibilities of Senior Management and Personnel; Identify energy consumption; Energy Baseline; Energy efficiency indicators; Staff training and engagement - Energy committees; Internal Audits; Administrative Review; Checking documents and files; Practical exercise
Practical training	Yes (case study)
Assessment	No
Training method	In classes: face-to-face training

Training material provided	PowerPoint slides	
Training facilities	Classroom style	
INFORMATION ABOUT THE TRAINERS / TRAINING PROVIDERS		
Trainers Profile	Engineering academic background, Energy specialist.	
Certified trainers (Yes / no)	Yes. Must be certified by the Human Recourses Development Authority (HRDA)	
Are the training courses /training providers accredited/certified by a credible authority / certification body?		The training course is approved by the International Certification Network (IQNet)
ADDITIONAL INFORMATION		
Contacts	Cyprus Certification Company, tel. 00357 22411438	
Course frequency	6 courses from 2013 to date	
No of trainees per year	In total 52 candidates were trained	
No of trainees per course	Average 9 candidates were trained per course	
Location (in case of class training method)	Nicosia, Cyprus	
Training or consulting services after the Course	No	

❖ Germany

Training Course Title:	AUDITS + CONSULTING - RESIDENTIAL BUILDINGS
Training Provider Name:	BAFA Guidelines, offered by many providers
COURSE OVERVIEW	
Aim (scope of the training)	Certification in auditing and consulting for energy efficiency in residential buildings "On-site" energy efficiency consulting BAFA
Level/Type of training	Additional qualification
Target groups	Architects, Engineers, Technicians
Entry requirements	Base qualification according to the 2014 EnEv regulations (see 1.1)
Qualifications/Certification obtained	„Energieberatung für Wohngebäude (Vor-Ort-Beratung, individueller Sanierungsfahrplan)" Energy Consulting for residential buildings ("on-site consulting", individualised renovation timetables) ; Registration as "on-site" consultant (BAFA); Inlcusion on the dena "energy-efficiency expert"
Duration/Structure	130 teaching units à 45 minutes 210 teaching units for persons without a formal qualification as an architect or engineer For an advanced certificate an extra 80 teaching units can be taken
Course Fee	1900 – 2300
EDUCATIONAL ISSUES	
Course Syllabus - Topics	**Legal frameworks**: EU Building guidelines; EnEv (energy-saving ordinance 2014) ; DIN V 18599 Energy evaluation of buildings; DIN 4108/4701 Heat insulation and heat requirement calculation **Building Envelopes in new and existing buildings**: Efficient house, solar construction, climate-friendly building design, Heat storage capacity; Building energy fundamentals; Thermal insulation materials and systems in comparison; Exterior and roof insulation in regards to humidity, sound and summer-time thermal insulation; Building envelope weak points: thermal bridges, ventilation heat losses; Internal and core insulation; Basics summer comfort / heat protection; Detailing: Thermal bridges in new building and existing buildings, analysis of thermal bridges **Systems engineering and renewable energies in new and existing buildings**; Overview heating technology; Overview water heating; Overview ventilation systems, heat recovery; Emissionen; Control technology for heating and domestic ventilation systems, Knowledge of hydraulic balancing, Regulation for renewable energies; Photovoltaics **Accounting and profitability**, Project reporting; Economic efficiency/profitability; Funding/support; Software programs for the energy evaluation of residential buildings; Communicating low investment measures; Issuing energy certificates and preparation of modernisation recommendations, also in connection with economic efficiency; KfW/BAFA funding specific details; Project report (energy audit/consultation report); Communication and consulting skills; Demand-consumption comparison; Application of DIN V 18599 with software,; Differentiation DIN V 18599 and DIN 4108/4701 **Planning/construction supervision**: Electrical engineering/lighting
Assessment	Exam by training provider
Training method	Face-to-face lessons, or online lessons
Training material provided	Yes
INFORMATION ABOUT THE TRAINERS / TRAINING PROVIDERS	

Are the training courses /training providers accredited by a credible authority / certification body?	dena list of criteria fulfilling courses after application

Training Course Title:	**PLANNIG AND IMPLEMENTATION –RESIDENTIAL BUILDINGS**
Training Provider Name:	**Guidelines by KfW + BAFA, many training providers**
COURSE OVERVIEW	
Aim (scope of the training)	Registration for energy efficient building and renovation - Residential buildings (KfW)
Level/Type of training	Additional qualification
Target groups	Architects, Technicians
Entry requirements	Base qualification according to the 2014 EnEv regulations (see 1.1)
Qualifications/Certification obtained	„Energieberatung für Wohngebäude (Vor-Ort-Beratung, individueller Sanierungsfahrplan)“ Energy Consulting for residential buildings (on-site consulting, individualised renovation timetables) Inlcusion on the dena “energy-efficiency expert”
Duration/Structure	130 teaching units à 45 minutes 210 teaching units for persons with a vocational training background instead of a university background
Course Fee	1800 – 2400 Euros
EDUCATIONAL ISSUES	
Course Syllabus - Topics	**Legal frameworks:** EU Building guidelines; EnEv (energy-saving ordinance 2014); DIN V 18599 Energy evaluation of buildings; DIN 4108/4701 Heat insulation and heat requirement calculation **Building Envelopes in new and existing buildings:** Efficient house, solar construction, climate-friendly building design, Heat storage capacity; Building energy fundamentals; Thermal insulation materials and systems in comparison; Exterior and roof insulation in regards to humidity, sound and summer-time thermal insulation; Building envelope weak points: thermal bridges, ventilation heat losses; internal and core insulation; Basics summer comfort / heat protection; Detailing: Thermal bridges in new and existing buildings, calculation of thermal bridges and proof of equivalence, design recommendations **Systems engineering and renewable energies in new and existing buildings:** Overview heating technology; Overview water heating; Overview ventilation systems, heat recovery; Emissions; Control engineering for heating and home ventilation systems, knowledge of hydraulic balancing, regulation for renewable energies; Ventilation: creation of ventilation concepts; Implementation of renewable energies; Photovoltaics **Accounting and profitability, Project reporting:** Economic efficiency/profitability; Funding/support; Software programs for the energy evaluation of residential buildings; Communicating low investment measures; Issuing of energy certificates as public legal proof after new construction and renovation; KfW funding specific details; Project report planning / construction documentation of a KfW efficiency house; Communication of consulting skills; Application of DIN V 18599 with software, Differentiation DIN V 18599 and DIN 4108/4701 **Planning/construction supervision:** Planning/implementation of airtight buildings, Tendering and contracting, construction time plans, Construction supervision/quality assurance;

	Detailing of construction supervision for new construction and renovation; Instruments for quality assurance: basics, application thermography and airtightness testing
Practical training	-
Assessment	Exam by training provider
Training method	Face-to-face lessons, or online lessons
Training material provided	Yes
INFORMATION ABOUT THE TRAINERS / TRAINING PROVIDERS	
Are the training courses /training providers accredited by a credible authority / certification body?	DENA list of criteria fulfilling courses after application

Training Course Title:	**PLANNIG AND IMPLEMENTATION – NON-RESIDENTIAL BUILDINGS**
Training Provider Name:	**Guidelines by KfW + BAFA, many training providers**
COURSE OVERVIEW	
Aim (scope of the training)	Registration for energy efficient building and renovation - Residential buildings (KfW)
Level/Type of training	Additional qualification
Target groups	Architects, Engineers, Technicians
Entry requirements	Base qualification according to the 2014 EnEv regulations (see 1.1) One base qualification Module; Audits + Consulting Residential buildings or Planning and Implementing in Residential Buildings
Qualifications/Certification obtained	For certification in the category “Energy Efficient building and renovating for non-residential buildings” ; Inlcusion on the dena “energy-efficiency expert”
Duration/Structure	80 teaching units à 45 minutes
Course Fee	1900 – 2500 Euros
EDUCATIONAL ISSUES	
Course Syllabus - Topics	**Legal frameworks:** Application of the EnEV (energy-saving ordinance 2014) in practice; Legal basis I: EU building directive, EnEG, EnEV, EEWärmeG; Legal basis II: Standards, especially DIN V 18599 **Building Envelopes in new and existing buildings:** Basics: efficient house, solar construction, climate-friendly building design, heat storage capacity; Thermal insulation materials and systems in comparison; External and roof insulation, taking into account moisture, sound and summer heat protection; Energy fundamentals; Basics summer comfort / heat protection **Systems engineering and renewable energies in new and existing buildings:** Overview heating technology, Overview cooling technology; Weak points in heating technology; Overview water heating; Overview ventilation systems, heat recovery; Emissions calculations; Lighting; Control engineering and building automation for non-residential buildings; Ventilation: development of ventilation concepts; Implementation of renewable energies; Photovoltaic **Accounting and profitability, Project reporting:** Economic efficiency/profitability; Subsidies for non-residential buildings and implementation model contracting; Software programs for the energy evaluation of non-residential buildings; Low-investment measures for non-residential buildings; Application of DIN V 18599; Issuing of efficiency-house certificates; KFW subsidy specific details; Project-reporting; Plausibility check, comparison of usage and requirements **Planning/construction supervision:** Tendering and contracting; Construction supervision/quality assurance; Detailing of construction supervision for new construction and renovation; Instruments for quality assurance

Assessment	Exam by training provider
Training method	Face-to-face lessons, or online lessons
Training material provided	Yes
INFORMATION ABOUT THE TRAINERS / TRAINING PROVIDERS	
Are the training courses /training providers accredited by a credible authority / certification body?	DENA list of criteria fulfilling courses after application

Training Course Title:	**CONSULTING + AUDITS IN SMES**
Training Provider Name:	**Guidelines by KfW + BAFA, many training providers**
COURSE OVERVIEW	
Aim (scope of the training)	Registration for energy efficiency audits and consulting – Small and medium enterprises (BAFA)
Level/Type of training	Additional qualification
Target groups	Architects, Engineers, Technicians
Entry requirements	Base qualification according to the 2014 EnEv regulations (see 1.1) One base qualification Module; Audits + Consulting Residential buildings or Planning and Implementing in Residential Buildings
Qualifications/Certification obtained	For certification in the category “Energy Efficiency Consulting and Auditing in SMEs” Inlcusion on the dena “energy-efficiency expert”
Duration/Structure	80 teaching units à 45 minutes
Course Fee	1600-2000 Euros
EDUCATIONAL ISSUES	
Course Syllabus - Topics	Explanations on legal issues of commercial energy consulting (e.g. EnEV non-residential buildings); Existing commercial building envelope (renovation of commercially used buildings); System technology including heating, cooling, lighting, ventilation, hot water preparation; Efficient power generation, especially cogeneration units; Cross-sectional technologies such as electric motors and drives, electrically driven pumps, room air conditioning systems, compressed air systems, heat recovery (heat exchange) and lighting systems; System optimization; Process technology, process cooling and process heating; Heat recovery / waste heat utilization; Measurement and control technology; Energy efficiency in information and communication technology; Profitability, investment and cost calculation, especially life cycle cost analysis; Further contents, which focus on the preparation, planning, implementation and follow-up of energy audits in companies; Energy management systems; Use of renewable energies in companies; funding opportunities and/or political background information
Assessment	Exam by training provider
Training method	Face-to-face lessons, or online lessons
Training material provided	Yes
INFORMATION ABOUT THE TRAINERS / TRAINING PROVIDERS	
Are the training courses /training providers accredited by a credible authority / certification body?	DENA list of criteria fulfilling courses after application

❖ Greece

Training Course Title:	ENERGY AUDIT – KENAK SOFTWARE APPLICATION FOR BUILDING ENERGY AUDIT
Training Provider Name:	University of West Attica/ Research Laboratory of Energy Applications and Energy Saving Systems
COURSE OVERVIEW	
Aim (scope of the training)	Delivers all the necessary theoretical and practical background for conducting energy audit in residential buildings or tertiary buildings in general
Level/Type of training	Seminar
Target groups	Diploma Engineers, MSc equivalent
Entry requirements	As defined by article 52, par. 3 of Law 4409/2016 (Government Gazette A 136) for Energy Auditors
Qualifications/Certification obtained	Engineering Diploma/Attendance Certification
Duration/Structure	36 hours (equally distributed in 3 weeks) 4 hours per day between 18:00-22:00 (Monday, Wednesday, Friday)
Course Fee	250 €
EDUCATIONAL ISSUES	
Course Syllabus – Topics	Introduction to Energy Inspections - Institutional Framework [4 hours]; Presentation of Technical Instructions: TOTEE 20701-1 (2017) and TOTEE 20701-2 (2017) - Part A [4 hours]; Presentation of Technical Instructions: TOTEE 20701-1 (2017) and TOTEE 20701-2 (2017) - Part B [4 hours]; Presentation of Technical Instructions: TOTEE 20701-1 (2017) and TOTEE 20701-2 (2017) - Part C [4 hours]; Energy saving interventions in buildings (shell, EM systems) [4 hours]; Using Buildingcert - Portal Access Information www.buildingcert.gr - Example 1 Visiting a residential building and preparing necessary data / metrics according to TOTE 20701-4 (2017) [2 + 2 hours]; Example 1 - Implementation of KENAK software for issuing energy certificate in residential building [4 hours]; Example 2 - Visit to a tertiary sector building for measurements and recording of necessary data [4 hours]Example 2 - Implementation of KENAK software for energy certification in tertiary sector building [4 hours]
Practical training	In site measurements
Assessment	-
Training method	Lectures, Software labs
Training material provided	Software tutorials, lecture presentations
Training facilities	Residential and tertiary buildings, University Labs
INFORMATION ABOUT THE TRAINERS / TRAINING PROVIDERS	
Trainers Profile	The lecturers of the seminar modules are members of the academic staff of the University of Western Attica with extensive experience in energy auditing as well as an external associate in energy auditing
Certified trainers (Yes / No)	Yes
ADDITIONAL INFORMATION	
Course frequency	Upon submission of 15-25 participants
Location (in case of class training method)	University of West Attica, Athens, Greece

Training Course Title:	ISO 50001: 2018- BASIC PRINCIPLES OF ENERGY MANAGEMENT SYSTEMS
Training Provider Name:	TÜV HELLAS
COURSE OVERVIEW	
Aim (scope of the training)	Upon completion of this Training Program participants will have acquired beyond their systematic knowledge of Management Systems (documentation control, training, internal audits, non-compliance management, review etc.) and fundamental knowledge of: establishing an appropriate energy policy; the energy planning of the activities of an organization that affect its energy performance; identifying energy needs and consumption; identifying opportunities to improve the energy performance of an activity or process; the definition of appropriate energy indicators for measuring and monitoring energy performance; identifying legal and other requirements regarding the organization's energy issues; defining specific objectives for energy efficiency; defining criteria for the efficient operation and maintenance of equipment with significant energy use; defining specifications for the supply of equipment or energy services
Level/Type of training	Seminar
Target groups	ISO 50001 is an important management tool for businesses and its effective implementation aims to improve their energy performance and reduce energy costs from their activity, product production and service delivery. The standard applies to all types and sizes of organizations and businesses and, due to the similarity of its structure to that of ISO14001: 2004, it is easy to integrate into existing and certified systems
Qualifications/Certification obtained	Analysis of key concepts of Energy Management; Energy Management Legislation; Principles and main purpose of an Energy Management System; Detailed presentation of standard requirements for both the design and internal/external inspection of an Energy Management System
Duration/Structure	2 days seminar
Course Fee	550 €
EDUCATIONAL ISSUES	
Course Syllabus - Topics	ISO 50001
INFORMATION ABOUT THE TRAINERS / TRAINING PROVIDERS	
Trainers Profile	Certification Manager, Head of Environment Sector, Chemical engineers, PhD
Certified trainers (Yes / No)	Yes
Are the training courses /training providers accredited by a credible authority / certification body?	Attendance Certification by TÜV HELLAS (TÜV NORD)
ADDITIONAL INFORMATION	
Location (in case of class training method)	Athens

Training Course Title:	ISO 50001 CQI & IRCA CERTIFIED COURSE NO. INSPECTORS / LEAD AUDITOR OF ENERGY MANAGEMENT SYSTEMS 1783- PROVIDED BY TÜV NORD CERT GMBH
Training Provider Name:	TÜV HELLAS
COURSE OVERVIEW	
Aim (scope of the training)	The purpose of the seminar is to provide participants with the necessary knowledge and skills so that they can perform first-, second- and third-party management systems audits in accordance with ISO 50001 and in accordance with ISO 19011 and ISO 17021 where applicable. More specifically, the training seminar will prepare participants with the necessary knowledge and skills to become competent Lead Inspectors
Level/Type of training	Seminar

Target groups	All those who need detailed knowledge of EnMS Process Control, Energy Management Consultants, Management personnel involved in the implementation and maintenance of ISO 50001, as well as Executives working with Regulators are welcome
Qualifications/Certification obtained	Successful completion of the seminar (including written examination) is achieved by obtaining a certificate that can be used to support the application of an interested party to be accredited as an IRCA auditor
Duration/Structure	5 days seminar (09:00-19:00 each day)
Course Fee	700 €
EDUCATIONAL ISSUES	
Course Syllabus - Topics	Introduction to the scope of an Energy Management System (EnMS), the standards of an EnMS, inspection of a Management System (MS) and a third-party Certification; Structure of P-D-C-A (Plan-Do-Check-Act); Interdependence between the concepts Management Responsibility, Energy Policy, Energy Planning, Performance Control, Review Management and Continuous Improvement; Differences between First-, Second- and Third-Party Inspections; The role and responsibility of the Inspector; Conduct all inspection processes through highly interactive assignments: design, conduct, report and verify EnMS inspection, including role exercises.
Practical training	N/A
Assessment	Written examination
INFORMATION ABOUT THE TRAINERS / TRAINING PROVIDERS	
Trainers Profile	Certification Manager, Head of Environment Sector, Chemical engineer, PhD
Certified trainers (Yes / No)	Yes
Are the training courses /training providers accredited by a credible authority / certification body?	A certificate that can be used to support an applicant's application for accreditation as an IRCA Auditor is provided by TÜV NORD CERT GmbH
ADDITIONAL INFORMATION	
Location (in case of class training method)	Athens

Training Course Title:	**EUREM – ENERGY SAVING SEMINAR**
Training Provider Name:	**German-Hellenic Chamber of Industry and Commerce**
COURSE OVERVIEW	
Aim (scope of the training)	The EUREM seminar is an educational program aimed at Energy Managers and professional engineers. It has started by the Nuremberg Chamber of Commerce 1999. By 2017, its work had been subsidized through three European projects, adding more countries in a network of 30 countries. In Greece, EUREM was launched in 2006, and the Hellenic-German Chamber of Commerce and Industry was then a partner with CRES, which had undertaken the adaptation of the material to the Greek version. There have been in Greece since 2008 seven (7) cycles in Athens and two (2) in Thessaloniki, creating a registry of 106 EUREM Energy Managers, while the worldwide register exceeds 5,000 specialists.
Level/Type of training	Specifically, the seminar includes the following: 19 days of physical presence courses; 17 topics divided into 3 subcategories; 4 e-learning topics; 1 test after completing the courses; 1 energy project in 1 month The EUREM seminar leads to the EUREM Certificate and the registration number after: 80% course attendance; 50% exam success; 50% on energy project.
Target groups	Professional engineers
Entry requirements	N/A

Qualifications/Certification obtained	EUREM seminar included in Joint Ministerial Decision 175275/2018 - Government Gazette 1927 / N / 30-05-2018, giving 3 points to the system of scoring for professionals qualifications of Energy Auditors
Duration/Structure	3 months, 2 days courses for each week (Friday 17:30-21:30 and Saturday 09:00-17:00)
Course Fee	1650 €
EDUCATIONAL ISSUES	
Course Syllabus - Topics	**Management modules:** Energy management systems**;** Project financial analysis and management**;** Legislation, energy trading & emissions. **Engineering modules:** Basic principles of energy; Energy data & load management; Energy requirements of buildings; Heating – Geothermal; Air conditioning; Cooling; Electric motors**;** Green-IT**;** Thermal processes**;** Cogeneration of heat & electricity**;** Lighting**;** Compressed air **RES modules:** Solar Energy; Biomass **E-learning topics:** Energy audits according to the Standard EN 16247 / ISO 50002**;** Energy corporate culture**;** Mobility & Transport Management **;** Industry 4.0 and Energy Saving
Practical training	Project Assignment
Assessment	Examination, Energy Project Delivery – Project work, Delivery of Energy Project - Energy study, Presentation of Energy Project - Energy Study
Training method	Tutorials
Training material provided	Yes, presentations, notes, regulations
Training facilities	N/A
INFORMATION ABOUT THE TRAINERS / TRAINING PROVIDERS	
Are the training courses /training providers accredited by a credible authority / certification body?	EUREM seminar included in Joint Ministerial Decision 175275/2018 - Government Gazette 1927 / N / 30-05-2018, giving 3 points to the system of scoring for professionals; qualifications of Energy Auditors;
ADDITIONAL INFORMATION	
Course frequency	Annually
Location (in case of class training method)	Athens, Thessaloniki

Training Course Title:	**HELLENIC PASSIVE BUILDING INSTITUTE**
Training Provider Name:	**HELLENIC PASSIVE BUILDING INSTITUTE**
COURSE OVERVIEW	
Aim (scope of the training)	The 2-day seminar (duration 18 hours long), provides the knowledge and practical applications that technicians need to implement in buildings in accordance with the world's most demanding very high energy efficiency standard, the Passive House standard. The seminar focuses on optimizing the building envelope and its systems while providing basic knowledge of design principles. Participants are taught construction practices that minimize thermal bridges, while maximizing the airtightness of the building by choosing many different materials. An introduction to building systems is provided, with an emphasis on heat recovery mechanical ventilation, heat pumps and RES technologies.
Level/Type of training	Seminar
Target groups	Technicians
Entry requirements	N/A
Qualifications/Certification obtained	Shell/envelope technician , Systems technician
Duration/Structure	2 days seminar
Course Fee	150 €

EDUCATIONAL ISSUES	
Course Syllabus - Topics	**1st Module:** Basic building design principles (90 minutes)**;** Economic efficiency of a passive building (90 minutes)**;** Building air tightness (90 minutes)**;** Construction progress - quality assurance (90 minutes) **2nd Module - Technical shell specification:** Heat insulation (90 minutes)**;** Thermal bridges (90 minutes)**;** Frames (90 minutes) **2nd Module - Technical systems specification:** Ventilation systems (225 minutes)**;** Ventilation in existing buildings - special constructions (45 minutes) **3rd Module - Technical shell specification:** Existing buildings (180 minutes)**;** Basic principles of ventilation**;** Basic heating - cooling principles (90 minutes) **3rd Module - Technical systems specification:** Heating - cooling (180 minutes)**;** Basic principles of insulation**;** Basic thermographic principles**;** Basic framework principles (90 minutes)
Practical training	N/A
Assessment	Written examination
ADDITIONAL INFORMATION	
Location (in case of class training method)	Athens

❖ Italy

Training Course Title:	BASES OF ENERGY MANAGEMENT. COURSE FOR ENERGY MANAGER AND EGE
Training Provider Name:	FIRE (FEDERAZIONE ITALIANA EFFICIENZA ENERGETICA)
COURSE OVERVIEW	
Aim (scope of the training)	The online training course for EM and EGE aims to provide a complete and in-depth preparation on all issues of energy management. The online training course addresses both EM who already operate in the field, and aspiring EGE UNI 11339 who intend to update their technical preparation given the exam for certification.
Level/Type of training	Not applicable
Target groups	Consultants, Energy Managers, Engineers, Certified EGE
Entry requirements	No requirements are needed
Qualifications/Certification obtained	Certificate of attendance. The course is part of the updating activities that can be reported to obtain professional training credits, presenting the self-certification of the informal updating. The training modules also respond to the obligation of professional updating provided for the maintenance of the EGE certification.
Duration/Structure	Online course, one month, divided into 10 modules of 4 hours each
Course Fee	366 €-732 € for the whole course. Possibility to register for the single module from 61 €-122 €.
EDUCATIONAL ISSUES	
Course Syllabus – Topics	Energy efficiency in the industrial and civil sector, Energy Performance Contract, electricity and gas market, ISO 14001 and ISO 50001 standards, project management, incentives, energy diagnostics, measurement and verification methodologies.
Practical training	No
Assessment	There is no form of evaluation. The certificate of participation will be issued to those who have attended at least 80% of the modules.
Training method	Online lectures
Training material provided	Presentations by teachers in pdf format
Training facilities	No
INFORMATION ABOUT THE TRAINERS / TRAINING PROVIDERS	
Trainers Profile	FIRE experts and certified EGE (SECEM)
Certified trainers (Yes / No)	Yes
Are the training courses /training providers accredited by a credible authority/certification body?	Yes (SECEM)
ADDITIONAL INFORMATION	
Contacts	FIRE, formazione@fire-italia.org http://fire-italia.org/calendario-eventi/corso-fire-fem-02-2020/
Course frequency	Information not available
No. of trained installer per year	Information not available

No. of trained installer per course	Information not available
Location (in case of class training method)	Online
Training or consulting services after the Course	No

Training Course Title:	**GLOBAL ENERGY MANAGEMENT – MAJOR OF THE MASTER IN INTERNATIONAL MANAGEMENT**
Training Provider Name:	**LUISS BUSINESS SCHOOL**
COURSE OVERVIEW	
Aim (scope of the training)	This program focuses on the transfer of basic knowledge about the energy industry as well as developing a thorough knowledge of the energy ecosystem. Students learn managerial skills and develop an understanding of the environmental and societal dimensions required to guide their actions. Despite being focussed on energy management, this training course could also be useful to sit for the EGE qualification.
Level/Type of training	Not applicable
Target groups	The Master is addressed to recent graduates who want to integrate a robust theoretical training with a strong practical knowledge of emerging trends in the energy industry and transformation management
Entry requirements	Undergraduate Degree in any discipline and the LUISS Admission Test: LUISS English Test(Applicants with high TOEFL/IELTS scores can be exempted from the English test); CEB SHL Logic Test – Inductive, Numerical, Deductive(Applicants with high GMAT/GRE scores can be exempted from the Logic test); Personal Interviews
Qualifications/Certification obtained	The Master provides students with 60 ECTS credits
Duration/Structure	The Master lasts 12 months and it is composed of 4 terms. Full Time
Course Fee	16000 €
EDUCATIONAL ISSUES	
Course Syllabus – Topics	**Core courses:** Technologies for Energy: Smart Grid, IoT and Smart Mobility; Megatrends in the Energy Ecosystem; Project Financing for Energy; Financial Modeling for Energy; Oil & Gas: Industry Fundamentals Challenged by New Sources and New Geopolitics; Managing Renewable Sources of Energy; Transformation in Power Utilities; Geopolitics.
Practical training	Labs and The Field Project (internship, entrepreneurial project, research project).
Assessment	Information not available
Training method	Combination of frontal lectures and labs
Training material provided	Information not available
Training facilities	Access to all Luiss facilities
INFORMATION ABOUT THE TRAINERS / TRAINING PROVIDERS	
Trainers Profile	University professor and Industry experts
Certified trainers (Yes / No)	Yes
Are the training courses /training providers	Yes

accredited by a credible authority/certification body?	
ADDITIONAL INFORMATION	
Contacts	Luiss Business School, masterluissbs@luiss.it https://businessschool.luiss.it/management-energy-industry/
Course frequency	Yearly
No. of trained installer per year	Information not available
No. of trained installer per course	Information not available
Location (in case of class training method)	Luiss Business School, Villa Blanc, Via Nomentana21600162 Rome (RM), Italy
Training or consulting services after the Course	Information not available

Training Course Title:	**TRAINING COURSE FOR EXPERT IN ENERGY MANAGEMENT - UNI CEI 11339: 2009 - INDUSTRIAL AND CIVIL SECTOR**
Training Provider Name:	**SUDFORMAZIONE**
COURSE OVERVIEW	
Aim (scope of the training)	The training course allows the acquisition of the "Expert in Energy Management" certification (EGE). It, therefore, provides adequate knowledge to identify actions, interventions and procedures for efficient use of energy, to prepare energy balances according to economic parameters and final energy uses. The course is certificated ICMQ (https://www.icmq.it)accredited by ACCREDIA.
Level/Type of training	Not applicable
Target groups	The training course is addressed to technicians in charge of energy management in the industrial and civil sector, and to all those who intend to approach energy systems.
Entry requirements	For those who intend to take the EGE exam: Bachelor's degree with three-year experience or technical diploma with ten-year experience in the reference sector
Qualifications/Certification obtained	Certificate of participation or EGE certification (if you have passed the final exam). The training course recognizes the professional credits for Engineers and Architects.
Duration/Structure	Course duration: 12 days Civil sector: 48 hours + 16 specific hours = 64 hours Industrial sector: 48 hours + 16 specific hours = 64 hours Civil and Industrial sectors: 80 hours
Course Fee	**Couse** Civil sector: € 1180,00; Industrial sector: € 1180,00 Civil and Industrial sectors: € 1470,00 **Exam** (can be done without attending the course) Civil sector: € 600,00; Industrial sector: € 600,00 Civil and Industrial sectors: € 750,00
EDUCATIONAL ISSUES	
Course Syllabus – Topics	**Core courses:** The professional figure of the “expert in energy management” (EGE) according to UNI 11339; Knowledge of the reference legislation and technical regulations; Electricity, gas and fuels markets; Techniques

	to evaluate energy savings; Energy incentives; Renewable sources: photovoltaic, geothermal, solar thermal, solar thermodynamic; Management and evaluation of projects; Energy performance contract; The energy certification; The ISO 50001 standard; Specific module for the industrial sector; Specific module for the civil sector.
Practical training	No
Assessment	**Exam** (can be done without attending the course) Civil sector: 1 written test (multiple choice)+ 1 case study + 1 oral test Industrialsector: 1 written test (multiple choice) + 1 case study + 1 oral test Civil and Industrial sectors:1 written test with additional topics (multiple choice) + 1 case study + 1 oral test
Training method	Frontal lectures
Training material provided	Information not available
Training facilities	Information not available
INFORMATION ABOUT THE TRAINERS / TRAINING PROVIDERS	
Trainers Profile	Information not available (established by the body that issues the certification)
Certified trainers (Yes / No)	Information not available (probably EGE)
Are the training courses /training providers accredited by a credible authority/certification body?	Yes
ADDITIONAL INFORMATION	
Contacts	Sudformazione, info@sudformazione.com https://www.sudformazione.com/corso-per-esperto-in-gestione-dellenergia-uni-cei-113392009-settore-industriale-e-civile/
Course frequency	Information not available
No. of trained installer per year	Information not available
No. of trained installer per course	Information not available
Location (in case of class training method)	Bari (BA), Italy
Training or consulting services after the Course	Information not available

Training Course Title:	**GESTIONE DEI CONSUMI ENERGETICI (ENERGY CONSUMPTION MANAGEMENT)**
Training Provider Name:	**UNIVERSITY OF ROME TOR VERGATA**
COURSE OVERVIEW	
Aim (scope of the training)	The training course provides the knowledge necessary for the management of energy requirements in companies producing goods and services. At the end of the course, the candidate can carry out energy audits and to support organizations in the development of their Energy Management Systems in compliance with to the international standard ISO 50001:2011 (development of energy policy and energy planning, the definition of energy best practices for design, operations, maintenance and procurement, the definition of energy measurement and control system, etc.).
Level/Type of training	Industrial engineering course (bachelor and master's degree)
Target groups	Mechanical, energy and management engineering students

Entry requirements	It is a public course and no requirements are needed. To sit for the exam, the students must register for the degree course or enrol for the single course to be attended (compatibly with the study plan).
Qualifications/Certification obtained	6 ECTS credits(university credits)
Duration/Structure	4 months, 30 lessons, 60 academic hours
Course Fee	Attendance is free but to take the exam, the university fee payment is needed
EDUCATIONAL ISSUES	
Course Syllabus - Topics	**Introduction to Energy Management:** energy management basics; enterprise as an energy system; energy efficiency; the role of the Energy Manager and energy management approach: quick fixes, energy projects and comprehensive energy management. **Energy Audit:** energy auditing basics, energy data collection, energy bill analysis, energy consumption analysis, electrical system audit, lighting system audit, air compressed system audit, HVAC system audit, thermal system audit, energy audit reporting, energy economics and energy projects evaluation. **Energy consumption monitoring and control:** defining an energy consumption measurement system, energy consumption targeting, energy consumption monitoring, energy consumption control (CUSUM chart and control chart), energy key performance indicators, information system for energy management. **Energy management system:** basics of the energy management system, ISO 50001 standard: general requirements for an energy management system, management responsibility, energy policy, energy planning (energy review, energy baseline, energy performance indicators, energy objectives, energy targets and energy management action plans), Implementation and operation (competence, training and awareness, operational control, design, procurement of energy services, products, equipment and energy), checking and management review. **Energy Cost Accounting**: basics of management accounting. definition of responsibility centres (energy cost centres) and standard costs; the information system for energy; energy budgeting and planning and control process; variance analysis of energy coss; set of indicators for variance analysis of energy cost. **Subsidies:** energy efficiency certificates; basics of Energy Service Contracts.
Practical training	Group exercise based on real cases, plant visits.
Assessment	Written and oral exam
Training method	Frontal lessons
Training material provided	The material provided during the lessons
Training facilities	No
INFORMATION ABOUT THE TRAINERS / TRAINING PROVIDERS	
Trainers Profile	University professor
Certified trainers (Yes / No)	Yes
Are the training courses /training providers accredited by a credible authority/certification body?	Yes
ADDITIONAL INFORMATION	

Contacts	**Course website:** https://didattica.uniroma2.it/informazioni/index/insegnamento/166890-Gestione-Dei-Consumi-Energetici **Macroareawebsite:** http://ing.uniroma2.it
Course frequency	Yearly
No. of trained installer per year	30
No. of trained installer per course	30
Location (in case of class training method)	University of Rome Tor Vergata, Rome (RM), Italy
Training or consulting services after the Course	No

Training Course Title:	**ENERGY MANAGER**
Training Provider Name:	**FESTO ACADEMY**
COURSE OVERVIEW	
Aim (scope of the training)	***The training course aims and includes the below:*** Energy management in key sectors (civil and industrial); Obtain an overall investigation methodology to quantify the energy performance of building-plant and process systems; Define and develop an optimal energy-economic plan; Obtain a deep knowledge of the legislative and regulatory context, to obtain certifications in the energy and environmental field; Check the efficiency and technical and economic effectiveness of energy management activities; Know the incentive mechanisms for energy efficiency and renewable energy sources; Prepare for the EGE certification exam (Energy Management Expert)
Level/Type of training	Not applicable
Target groups	Energy manager, maintenance managers, technical services managers, figures involved in the management of the energy component in the industrial process
Entry requirements	No requirements are needed
Qualifications/Certification obtained	No
Duration/Structure	Full course: 6 days; Module 3: 4 days; Module 1 and 2: 2 days; Module 1 or 2: 1 day
Course Fee	Full course: € 2.900,00; Module 3: € 2.100,00 Module 1 and 2: € 1.300,00; Module 1 or 2: € 700,00
EDUCATIONAL ISSUES	
Course Syllabus - Topics	**Module 1** The role of the Energy manager; Diagnosis and analysis of energy consumption. **Module 2** Energy Management Systems (ISO 50001), **Module 3** Energy management contracts; Energy and Facility Management; Critical analysis, evaluation and enhancement of interventions; Economics; Project Management for Energy Efficiency; Being Project

	Leader: management of collaborators and communication.
Practical training	No
Assessment	Information not available
Training method	Frontal lectures
Training material provided	Information not available
Training facilities	No
INFORMATION ABOUT THE TRAINERS / TRAINING PROVIDERS	
Trainers Profile	Information not available
Certified trainers (Yes / No)	Information not available
Are the training courses /training providers accredited by a credible authority/certification body?	Information not available
ADDITIONAL INFORMATION	
Contacts	Festo Academy, contatti@festo.com https://www.festocte.it/academy/energy_efficiency/
Course frequency	Information not available
No. of trained installer per year	Information not available
No. of trained installer per course	Information not available
Location (in case of class training method)	Assago (MI), Italy
Training or consulting services after the Course	Information not available

Training Course Title:	**ENERGY MANAGER**
Training Provider Name:	**ENEA**
COURSE OVERVIEW	
Aim (scope of the training)	The training course is addressed to people involved in organizational activities. It considers the characteristics of the sector and markets in which a company operates and the main elements that contribute to the functioning of the organization; the most common organizational models; the organization of public administrations, the relationship between the organizational choices of a company, the characteristics of its market and territory; the factors that contribute to producing the results of the organization, i.e. energy, quality certification, environmental certification.
Level/Type of training	Not applicable
Target groups	Energy Manager
Entry requirements	No requirements are needed
Qualifications/Certification obtained	Certificate of participation (after request)
Duration/Structure	10 Modules
Course Fee	Free
EDUCATIONAL ISSUES	
Course Syllabus - Topics	Module 01 - Energy, development and environment; Module 02 - Fundamentals of energetics; Module 03 –EGE, tasks and functions Module 04 - Efficient use of energy; Module 05 - Renewable energy sources; Module 06 - Energy accounting; Module 07 - Legislation and contract law; Module 08 - Organization and Management; Module 09

	- Communication and marketing; Module 10 - Economy and finance
Practical training	No
Assessment	No
Training method	Online Course
Training material provided	Course material
Training facilities	No
INFORMATION ABOUT THE TRAINERS / TRAINING PROVIDERS	
Trainers Profile	Information not available
Certified trainers (Yes / No)	Information not available
Are the training courses /training providers accredited by a credible authority/certification body?	Yes
ADDITIONAL INFORMATION	
Contacts	ENEA, e-learn@enea.it http://www.formazione.enea.it/
Course frequency	Not applicable
No. of trained installer per year	Information not available
No. of trained installer per course	Information not available
Location (in case of class training method)	Online
Training or consulting services after the Course	No

❖ Romania

Training Course Title:	*ACCREDITED ENERGY MANAGER FOR INDUSTRY*
Training Provider Name:	*ROMANIAN TECHNICAL UNIVERSITIES – EG. TECHNICAL UNIVERSITY OF CLUJ-NAPOCA*
COURSE OVERVIEW	
Aim (scope of the training)	To prepare professionals in energy / electrical / thermal / mechanical and civil engineering to become accredited Energy Managers for industry and represent the energy users with an annual energy consumption of more than 1000 toe/yr. in the relation with the Energy Efficiency Department (EED) and to report according to the energy efficiency law 121/2014 all the required energy and other data to this EED.
Level/Type of training	Post-graduate in only technical universities
Target groups	Engineers employed in private or public companies, which have to report by law the energy consumption or which offer energy services.
Entry requirements	To be professionals with more than 3 years-experience in power / electrical / thermal / mechanical and civil engineering, with a bachelor diploma.
Qualifications/Certification obtained	Accredited Energy Manager for Industry.
Duration/Structure	Variable in each university from one week up to 3 months of scheduled direct and online meeting, with at least 120 hours in total.
Course Fee	Between 500 – 1000 Eur.
EDUCATIONAL ISSUES	
Course Syllabus – Topics	***Corse Course:*** Energy management fundamentals; Energy Efficiency Programme preparation; Energy Markets; Energy performance contracting; Energy Service Companies – ESCOs; Energy analysis in different industrial processes
Practical training	Presented case studies; Home-works with calculation sheets
Assessment	Preparation of a case study for its own company Test with multiple answers
Training method	Direct meetings; Online meetings; Home-work materials
Training material provided	Books – electronic contents; Power-point presentations Calculation sheets
Training facilities	Power Engineering and Thermal Engineering laboratories
INFORMATION ABOUT THE TRAINERS / TRAINING PROVIDERS	
Trainers Profile	Doctor Engineers in Power / Electrical / Thermal / Mechanical / Civil Engineering, employed in or by the universities
Certified trainers (Yes / No)	No
Are the training courses /training providers accredited by a credible authority / certification body?	No
ADDITIONAL INFORMATION	
Contacts	On the website of each technical university in Romania
Course frequency	When at least 10 to 15 people are gathered to form a class
No. of trained people per year	At national level, no more than 40 – 50 professionals

No. of trained people per course	Average of 10 people
Location (in case of class training method)	In each university (Bucharest, Cluj, Iasi, Craiova, Brasov, Baia Mare, Constanta, Timisoara)
Training or consulting services after the Course	No

Training Course Title:	***ACCREDITED ENERGY AUDITOR FOR INDUSTRY***
Training Provider Name:	***ROMANIAN TECHNICAL UNIVERSITIES – EG. POLITECHNICA UNIVERSITY OF BUCHAREST***
COURSE OVERVIEW	
Aim (scope of the training)	To prepare professionals in energy / electrical / thermal / mechanical and civil engineering to become accredited Energy Auditors and perform energy audits for industry for obliged by law energy users with an annual energy consumption of more than 1000 toe/yr. in the relation with the Energy Efficiency Department (EED) and to report according to the energy efficiency law 121/2014 all the realised energy audits to this EED.
Level/Type of training	Post-graduate in only technical universities
Target groups	Engineers as authorized physical person or employed in private or public companies, which offer energy services.
Entry requirements	To be professionals with more than 3 years-experience in power / electrical / thermal / mechanical and civil engineering, with a bachelor diploma.
Qualifications/Certification obtained	Accredited Energy Auditor for industry – complex type Accredited Energy Auditor for industry – electricity Accredited Energy Auditor for industry – thermal
Duration/Structure	Variable in each university from one week up to 3 months of scheduled direct and online meeting, with at least 120 hours in total.
Course Fee	Between 500 – 1000 Eur.
EDUCATIONAL ISSUES	
Course Syllabus – Topics	***Corse Course:*** Energy audit fundamentals; Energy Audit content and elaboration; Energy analysis and energy balances evaluation; Energy efficiency solutions; Energy measurements and sensors; Energy performance contracting; Energy Service Companies – ESCOs; Cost-benefit analysis
Practical training	Presented case studies Home-works with calculation sheets
Assessment	Preparation of a case study for a company; Test with multiple answers
Training method	Direct meetings; Online meetings; Home-work materials
Training material provided	Books – electronic contents; Power-point presentations; Calculation sheets
Training facilities	Power Engineering and Thermal Engineering laboratories
INFORMATION ABOUT THE TRAINERS / TRAINING PROVIDERS	

Trainers Profile	Doctor Engineers in Power / Electrical / Thermal / Mechanical / Civil Engineering, employed in or by the universities
Certified trainers (Yes / No)	No
Are the training courses /training providers accredited by a credible authority / certification body?	No
ADDITIONAL INFORMATION	
Contacts	On the website of each technical university in Romania
Course frequency	When at least 10 to 15 people are gathered to form a class
No. of trained people per year	At national level, no more than 40 – 50 professionals
No. of trained people per course	Average of 10 people
Location (in case of class training method)	In each university (Bucharest, Cluj, Iasi, Craiova, Brasov, Baia Mare, Constanta, Timisoara)
Training or consulting services after the Course	No

Training Course Title:	**ACCREDITED ENERGY MANAGER FOR LOCAL COMMUNITIES**
Training Provider Name:	**ROMANIAN TECHNICAL UNIVERSITIES – EG. TECHNICAL UNIVERSITY OF CLUJ-NAPOCA**
COURSE OVERVIEW	
Aim (scope of the training)	To prepare professionals in energy / electrical / thermal / mechanical and civil engineering to become accredited Energy Managers for local communities with more than 20.000 inhabitants and represent the local public authorities in the relation with the Energy Efficiency Department (EED) and to report according to the energy efficiency law 121/2014 all the required energy and other data to this EED.
Level/Type of training	Post-graduate in only technical universities
Target groups	Engineers employed in public local authorities, which have to report by law the energy consumption or which offer energy services.
Entry requirements	To be professionals with more than 3 years-experience in power / electrical / thermal / mechanical and civil engineering, with a bachelor diploma.
Qualifications/Certification obtained	Accredited Energy Manager for local communities with more than 20.000 inhabitants.
Duration/Structure	Variable in each university from one week up to 3 months of scheduled direct and online meeting, with at least 120 hours in total.
Course Fee	Between 500 – 1000 Eur.
EDUCATIONAL ISSUES	
Course Syllabus – Topics	***Corse Course:*** Energy management fundamentals; Energy Efficiency Programme preparation; Energy Markets; Energy performance contracting;

	Energy Service Companies – ESCOs; Energy analysis in for building and utilities; Cost-benefit analysis
Practical training	Presented case studies; Home-works with calculation sheets
Assessment	Preparation of a case study for a local public authority; Test with multiple answers
Training method	Direct meetings; Online meetings; Home-work materials
Training material provided	Books – electronic contents; Power-point presentations Calculation sheets
Training facilities	Power Engineering and Thermal Engineering laboratories
INFORMATION ABOUT THE TRAINERS / TRAINING PROVIDERS	
Trainers Profile	Doctor Engineers in Power / Electrical / Thermal / Mechanical / Civil Engineering, employed in or by the universities
Certified trainers (Yes / No)	No
Are the training courses /training providers accredited by a credible authority / certification body?	No
ADDITIONAL INFORMATION	
Contacts	On the website of each technical university in Romania
Course frequency	When at least 10 to 15 people are gathered to form a class
No. of trained people per year	At national level, no more than 40 – 50 professionals
No. of trained people per course	Average of 10 people
Location (in case of class training method)	In each university (Bucharest, Cluj, Iasi, Craiova, Brasov, Baia Mare, Constanta, Timisoara)
Training or consulting services after the Course	No

Training Course Title:	***ACCREDITED ENERGY AUDITOR FOR BUILDINGS***
Training Provider Name:	***ROMANIAN TECHNICAL UNIVERSITIES – EG. TECHNICAL UNIVERSITY OF CLUJ-NAPOCA***
COURSE OVERVIEW	
Aim (scope of the training)	To prepare professionals in civil / energy / electrical / thermal and mechanical engineering to become accredited Energy Auditors for buildings and perform building energy audits and energy performance certificates for buildings, according to the energy performance Methodology MC, approved by the Ministry of Development and according to the energy performance of the buildings law 372/2005.
Level/Type of training	Post-graduate in only technical universities
Target groups	Engineers
Entry requirements	To be professionals with more than 5 years-experience in civil / power / electrical / thermal and mechanical engineering, with a bachelor diploma.
Qualifications/Certification obtained	Accredited Energy Auditor for buildings – type I. Accredited Energy Auditor for buildings – type II.

Duration/Structure	Usually from 3 to 6 months of scheduled direct and online meeting, with at least 190 hours in total.
Course Fee	Between 1000 – 2000 Eur.
EDUCATIONAL ISSUES	
Course Syllabus – Topics	***Core Course:*** Thermal performance of the building envelope; HVAC installations energy required levels; Lighting energy required level; Energy Performance Certification; Energy Audit report; Cost-benefit analysis
Practical training	Presented case studies Home-works with calculation sheets
Assessment	Preparation of a case study energy audit for a building Test with multiple answers as an exam hosted by the Ministry of Development
Training method	Direct meetings; Online meetings; Home-work materials
Training material provided	Books – electronic contents; Power-point presentations Calculation sheets
Training facilities	Power Engineering and Thermal Engineering laboratories
INFORMATION ABOUT THE TRAINERS / TRAINING PROVIDERS	
Trainers Profile	Doctor Engineers in Civil Engineering, employed in or by the universities
Certified trainers (Yes / No)	No
Are the training courses /training providers accredited by a credible authority / certification body?	Yes. The Ministry of Development
ADDITIONAL INFORMATION	
Contacts	On the website of each technical university in Romania
Course frequency	When at least 20 to 30 people are gathered to form a class
No. of trained people per year	At national level, no more than 100 – 150 professionals
No. of trained people per course	Average of 20 people
Location (in case of class training method)	In each university (Bucharest, Cluj, Iasi, Craiova, Brasov, Baia Mare, Constanta, Timisoara)
Training or consulting services after the Course	No

❖ Slovenia

Training Course Title:	EVROPSKI ENERGETSKI MENEDŽER – EUREM (EUROPEAN ENERGY MANAGER[8]
Training Provider Name:	JOŽEF STEFAN INSTITUTE – ENERGY EFFICIENCY CENTRE
COURSE OVERVIEW	
Aim (scope of the training)	The aim of the course is to: prepare an analysis of company's internal energy audit, technical and organizational concepts of energy efficiency projects and to manage such projects and provide their adequate presentation to company's executives, to estimate and assure energy savings as well as constant internal improvements.
Level/Type of training	Standardized training of further education
Target groups	To all who wish to gain a comprehensive overview of areas energy managers work on and relevant skills for successful energy management, especially for those responsible for energy management in companies of public and private sector, building managers, plant and process managers, process engineers.
Qualifications/Certification obtained	Licenced European Energy Manager (CCI)
Duration/Structure	6-8 months: Preparational activities (EUREM employees), Educational modules (4 modules + exam), Practical training (on-site operations, measurements and consulations)
Course Fee	2.000€ (+ VAT)
EDUCATIONAL ISSUES	
Course Syllabus - Topics	**Module 1**: European and Slovenian energy legislation and regulations; Natural gas (market and trade); Electrical energy (market and trade); Emissions; Economical analysis of energy efficiency projects; Financial sources for financing EE, RES measures and ECO innovations; Measurements in energy sector and safety regulations; Management and organization – social skills and combating conflicts; Energy management; Basics of energy; Preparation of EPC's **Module 2:** Energy audits, overview of practical training**;** Gathering and analyzing data (energy supply and energy consumption)**;** Energy management in practice**;** Digitalization of processes and forecasting energy consumption**;** Lighting**;** Energy-Efficient buildings**;** Heating**;** Processed heat **Module 3:** Air Conditioning**;** Cooling**;** Electromotors**;** Advanced methods for complex system energy analysis**;** Practical cases in Slovenia in the EU**;** Cogeneration of energy**;** Innovations, effectivity and quality – good examples from practical cases **Module 4:** Measurements and regulation**;** Energy-efficient use of water**;** Process optimization**;** Compressed air**;** Solar energy**;** Solar collectors for heat energy production**;** Photovoltaics**;** Biomass energy**;** Biogas energy**;** Green office: suitable working environment**;** Energy-efficient transformation
Practical training	Choosing mentor for the project assessment; On-site operations, measurements and consultations; Presenting findings from practical training and the project assessment in front of the Course Committee
Assessment	After education modules: written exam; After practical training and finishing project assessment: presentation and defense of the project assessment in front of the Course Committee
Training method	Both: courses and practical training
Training material provided	Yes: Material/literature in basic knowledge of topics (energy management, energy regulations, energy technology etc.), for theoretical courses, exercises, study cases and control lists.
Training facilities	Reactor Infrastructure Centre, Jožef Stefan Institute – Energy Efficiency Centre, Jamova cesta 39, 1000 Ljubljana, Slovenia

INFORMATION ABOUT THE TRAINERS / TRAINING PROVIDERS		
Trainers Profile	No info	
Certified trainers (Yes / No)	Yes	
Are the training courses /training providers accredited by a credible authority / certification body?		Yes
ADDITIONAL INFORMATION		
Contacts	Dr. Boris Sučić (+386 1 588 52 99; boris.sucic@ijs.si); Igor Ribič (+386 1 588 52 37; igor.ribic@ijs.si)	
Course frequency	Once per year (from March to December)	
No. of trained installer per year	From 15 to 20	
No. of trained installer per course	From 15 to 20	
Location (in case of class training method)	Reactor Infrastructure Centre, Jožef Stefan Institute – Energy Efficiency Centre, Jamova cesta 39, 1000 Ljubljana, Slovenia	
Training or consulting services after the Course	Yes: monitoring the implementation of project assessments, consultations with mentor and other experts, questionnaires, workshops, individual meetings, EUREM Alumni meetings, EUREM conferences.	

Training Course Title:	**BUREAU VERITAS EN1 ENERGY MANAGEMENT SYSTEMS AND COMPLIANCES WITH ISO 50001:2018**
Training Provider Name:	**BUREAU VERITAS**
COURSE OVERVIEW	
Aim (scope of the training)	Participants will acquire their systematic knowledge of Energy Management Systems and fundamental knowledge of ISO 50001.
Level/Type of training	Seminar
Target groups	For businesses and their energy managers, consultants etc. who aim to improve the energy performance and reduce energy costs from their activity, product production and service delivery. For energy auditors with already existing knowledge of ISO 50001:2011 that wish to upgrade their knowledge.
Entry requirements	-
Qualifications/Certification obtained	Certificate of Attendance for course: EN1 ENERGY MANAGEMENT SYSTEMS AND COMPLIANCES WITH ISO 50001:2018
Duration/Structure	1-day seminar (8 hours)
Course Fee	245 € (+ VAT)
EDUCATIONAL ISSUES	
Course Syllabus - Topics	ISO 50001:2018
Training method	Lectures with discussions
Training facilities	M Hotel, Derčeva ulica 4, 1000 Ljubljana, Slovenia
ADDITIONAL INFORMATION	
Contacts	Andrej Uršič, Gregor Simonič, Janko Remec + 386 1 4757 669; seminarji@si.bureauveritas.com
Location (in case of class training method)	M Hotel, Derčeva ulica 4, 1000 Ljubljana, Slovenia

Training Course Title:	**BUREAU VERITAS EN2 SEMINAR FOR ENERGY AUDITORS THAT DEAL WITH ENERGY MANAGEMENT SYSTEMS COMPLIANT WITH ISO 50001:2018**
Training Provider Name:	**BUREAU VERITAS**
COURSE OVERVIEW	
Aim (scope of	Participants will acquire their systematic knowledge of Energy Management Systems and

the training)	fundamental knowledge of ISO 50001: understanding an appropriate energy policy, its structure and requirements; the energy planning of the activities of an organization that affect its energy performance; identifying opportunities to improve the energy performance of an activity or process; the definition of appropriate energy indicators for measuring and monitoring energy performance.
Level/Type of training	Seminar
Target groups	For businesses and their energy managers, consultants etc. who aim to improve the energy performance and reduce energy costs from their activity, product production and service delivery. For energy auditors with already existing knowledge of ISO 50001:2011 that wish to upgrade their knowledge.
Entry requirements	-
Qualifications/Certification obtained	Certificate of Attendance for course: EN2 SEMINAR FOR ENERGY AUDITORS THAT DEAL WITH ENERGY MANAGEMENT SYSTEMS COMPLIANT WITH ISO 50001:2018
Duration/Structure	2-day seminar (16 hours)
Course Fee	345 € (+ VAT)
EDUCATIONAL ISSUES	
Course Syllabus - Topics	ISO 50001:2018
Practical training	Yes
Assessment	Written exam
Training method	Lectures with discussions and practical training (exercises)
Training facilities	M Hotel, Derčeva ulica 4, 1000 Ljubljana, Slovenia
ADDITIONAL INFORMATION	
Contacts	Andrej Uršič, Gregor Simonič, Janko Remec + 386 1 4757 669; seminarji@si.bureauveritas.com
Location (in case of class training method)	M Hotel, Derčeva ulica 4, 1000 Ljubljana, Slovenia

Training Course Title:	**BUREAU VERITAS EMS4 – SEMINAR FOR ENERGY AUDITORS THAT DEAL WITH ENVIRONMENTAL MANAGEMENT SYSTEMS COMPLIANT WITH ISO 14001:2015**
Training Provider Name:	**BUREAU VERITAS**
COURSE OVERVIEW	
Aim (scope of the training)	Participants will acquire their systematic knowledge of Environmental Management Systems and fundamental knowledge of ISO 14001: understanding an appropriate environment policy, its structure and requirements, planning of the activities of an organization that affect its waste and environment system, identifying opportunities to improve waste management of an activity or process, writing certain reports concerning the assessment of the waste (environment) management system.
Level/Type of training	Seminar
Target groups	For businesses, and employees or consultants, responsible for environment and waste management and for energy auditors that wish to receive detailed, fundamental knowledge of ISO 14001:2015.
Entry requirements	/
Qualifications/Certification obtained	Certificate of Attendance for course: EMS4 – Seminar for Energy Auditors that Deal with Environmental Management Systems Compliant with ISO 14001:2015 and Registration into BV Energy Auditor ISO 14001:2015 Register
Duration/Structure	2-day seminar (16 hours)
Course Fee	335 € (+ VAT)
EDUCATIONAL ISSUES	

Course Syllabus - Topics	ISO 14001:2015
Practical training	Yes
Assessment	Written exam
Training method	Lectures with discussions and practical training (exercises)
Training material provided	No info
Training facilities	M Hotel, Derčeva ulica 4, 1000 Ljubljana, Slovenia
ADDITIONAL INFORMATION	
Contacts	Andrej Uršič, Gregor Simonič, Janko Remec, Miran Gašper, Špela Korent Urek, Viljem Strašek + 386 1 4757 669; seminarji@si.bureauveritas.com
Location (in case of class training method)	M Hotel, Derčeva ulica 4, 1000 Ljubljana, Slovenia

Training Course Title:	**BUREAU VERITAS EMS5 – SEMINAR FOR ENERGY AUDITORS THAT DEAL WITH ENVIRONMENTAL MANAGEMENT SYSTEMS COMPLIANT WITH ISO 14001:2015 (CQI – IRCA APPROVED SEMINAR PR315)**
Training Provider Name:	**BUREAU VERITAS**
COURSE OVERVIEW	
Aim (scope of the training)	Participants will be able to conduct value-added inspections according to ISO 14001:2015, understand an appropriate environment policy, its structure and requirements (between ISO 14001, ISO 19011 and ISO 17021), understand key environmental goals, planning activities of an organization that affect its waste and environment system, identify opportunities to improve waste management of an activity or process and write certain reports concerning the assessment of the waste (environment) management system.
Level/Type of training	Seminar
Target groups	For those wishing to register with the IRCA auditors register, for any serious professional dealing with environmental issues, especially those responsible for implementing and maintaining environmental management systems and managing programs for internal audits, for those who are required to perform more demanding and extensive operational audits and for those seeking to develop their skills in inspection and the environment at a professional level.
Entry requirements	Knowledge of ISO 14001:2015 and experience with managing internal audits.
Qualifications/Certification obtained	CQI-IRCA-approved certificate
Duration/Structure	5-day seminar
Course Fee	1.345 € (+ VAT)
EDUCATIONAL ISSUES	
Course Syllabus - Topics	Requirements of ISO 14001:2015, environmental management system; Key areas of focus for the inspection of key environmental processes; Roles and responsibilities of inspectors and chief inspectors; Skills and the development of inspectors; Review of compliance inspection; Objectives and types of environmental inspections; Procedures and techniques for the design, conduct of the inspection and the preparation of the inspection reports; Post-inspection and continuous improvement inspection actions; Effective planning, inspection and reporting of inspection based on applicable inspection standards; Identification of valid findings, non-compliance and management of corrective actions; Certification (according to ISO 17021 and IAF

	MD1 specifications); ISO 19011 and CQI-IRCA criteria
Practical training	Yes
Assessment	Written exam
Training method	Lectures with discussions, group work and practical training (exercises)
Training material provided	No info
Training facilities	M Hotel, Derčeva ulica 4, 1000 Ljubljana, Slovenia
ADDITIONAL INFORMATION	
Contacts	Janko Remec, Rasto Jurca + 386 1 4757 669; seminarji@si.bureauveritas.com
Location (in case of class training method)	M Hotel, Derčeva ulica 4, 1000 Ljubljana, Slovenia

Training Course Title:	**INTERNAL AUDITORS ISO 50001:2018**
Training Provider Name:	**TÜV SÜD**
COURSE OVERVIEW	
Aim (scope of the training)	Participants will acquire the systematic knowledge of Energy Management Systems and fundamental knowledge of ISO 50001:2018 and ISO 19011:2018. Attendees will establish main principles of an appropriate energy policy, energy planning of the activities of an organization that affect its energy performance, define appropriate energy indicators for measuring and monitoring energy performance and identify legal and other requirements regarding the organization's energy issues.
Level/Type of training	Seminar
Target groups	For internal auditors that deal with Energy Management Systems, energy managers, process engineers and for businesses that aim to improve their energy performance and reduce energy costs from their activity, product production and service delivery.
Entry requirements	-
Qualifications/Certification obtained	Certificate of Attendance for course: INTERNAL AUDITORS ISO 50001:2018
Duration/Structure	2-day seminar (14 hours)
Course Fee	370 € (+ VAT)
EDUCATIONAL ISSUES	
Course Syllabus - Topics	Key concepts of Energy Management; Energy Management Legislation; Principles and main purpose of an Energy Management System; ISO 50001:2018
Practical training	Yes, workshop
Assessment	Written exam
Training method	Lectures with discussions, workshop and practical training
Training material provided	No info
Training facilities	No info
INFORMATION ABOUT THE TRAINERS / TRAINING PROVIDERS	
Trainers Profile	Head of Course trainings
Certified trainers (Yes / No)	Yes
Are the training courses /training providers accredited by a credible authority / certification body?	Attendance Certification by TÜV SÜD
ADDITIONAL INFORMATION	
Contacts	Vilko Švab (+386 2 3333 551 vilko.svab@tuv-sud.si), usposabljanje@tuv-sud.si

Training Course Title:	ENERGY MANAGEMENT SYSTEM ISO 50001:2018
Training Provider Name:	**TÜV SÜD**
COURSE OVERVIEW	
Aim (scope of the training)	Participants will acquire the systematic knowledge of Energy Management Systems (and the integration with other management systems) and fundamental knowledge of ISO 50001:2018.
Level/Type of training	Seminar
Target groups	For internal auditors that deal with Energy Management Systems, energy managers, process engineers and for businesses that aim to improve their energy performance and reduce energy costs from their activity, product production and service delivery.
Entry requirements	-
Qualifications/Certification obtained	Certificate of Attendance for course: ENERGY MANAGEMENT SYSTEM ISO 50001:2018
Duration/Structure	1-day seminar (7 hours)
Course Fee	250 € (+ VAT)
EDUCATIONAL ISSUES	
Course Syllabus - Topics	Key concepts of Energy Management; Principles and main purpose of an Energy Management System and integration with other management systems; ISO 50001:2018
Training method	Lectures with discussions.
Training material provided	No info
Training facilities	No info
INFORMATION ABOUT THE TRAINERS / TRAINING PROVIDERS	
Trainers Profile	Head of Course trainings
Certified trainers (Yes / No)	Yes
Are the training courses /training providers accredited by a credible authority / certification body?	Attendance Certification by TÜV SÜD
ADDITIONAL INFORMATION	
Contacts	Vilko Švab (+386 2 3333 551 vilko.svab@tuv-sud.si), usposabljanje@tuv-sud.si

Training Course Title:	SEMINAR FOR ENERGY AUDITORS: ENERGY MANAGEMENT SYSTEM ISO 50001:2018
Training Provider Name:	**SIQ**
COURSE OVERVIEW	
Aim (scope of the training)	Participants will acquire the systematic knowledge of Energy Management Systems (and the integration with other management systems) and fundamental knowledge of ISO 50001:2018.
Level/Type of training	Seminar
Target groups	For internal and energy auditors that deal with Energy Management Systems, energy managers, ecologists and for businesses that aim to improve their energy performance and reduce energy costs from their activity, product production and service delivery. For all that would like to receive knowledge of ISO 50001:2018.
Qualifications/Certification obtained	Certificate of Attendance for course: ENERGY MANAGEMENT SYSTEM ISO 50001:2018
Duration/Structure	3-day seminar (35 hours)

Course Fee	830 € (+ VAT)
EDUCATIONAL ISSUES	
Course Syllabus - Topics	Key concepts of Energy Management; Principles and main purpose of an Energy Management System and integration with other management systems; ISO 50001:2018 and differences with ISO 50001:2011; Energy policy, energy planning, energy audits, energy indicators, energy consumption, energy action plans; Efficient implementation of Energy Management System; Increasing energy efficiency with EMS
Assessment	Written exam
Training method	Lectures with discussions, workshop
Training material provided	Yes (5 days before the lecture)
Training facilities	Slovenian Institute of Quality and Metrology, Mašera – Spasićeva ulica 10, 1000 Ljubljana, Slovenia
ADDITIONAL INFORMATION	
Contacts	Bogomil Kandus, Blanka Kaker, Marjeta Gabrovšek (+386 1 5609 712 marjeta.gabrovsek@siq.si)
Location (in case of class training method)	Slovenian Institute of Quality and Metrology, Mašera – Spasićeva ulica 10, 1000 Ljubljana, Slovenia

❖ Spain

Training Course Title:	ENERGY MANAGEMENT SPECIALIST
Training Provider Name	*INSTITUTO SUPERIOR DEL MEDIO AMBIENTE (ISM)*
COURSE OVERVIEW	
Aim (scope of the training)	Energy Management aims at the continuous improvement in the use of energy by means of a more efficient use of it, reducing its consumption and making a better use of renewable energies, thereby reducing the costs associated with the energy bill and reducing greenhouse gas emissions. The Energy Management Specialist program is aimed at providing the tools, methods and practical knowledge needed to optimize energy management in different business sectors. The objectives are: To know the general concepts and fundamentals of energy; Understand energy supply and procurement operations; Know how to carry out an energy analysis of company buildings and industrial operations; Know the measurement equipment and data collection methodologies; Learn how to conduct energy audits in accordance with the collection of standards UNE-EN 16247; To implement an Energy Management System according to ISO 50001; To know the ISO 50001 standard in detail, the objective of its requirements; its philosophy and the different approaches when applying said standard.
Level/Type of training	Energy Management Specialist Specialized technical training in the environment
Target groups	Environmental managers or technicians from large companies interested in carrying out and/ or supervising the energy audits that their company has to carry out. Environmental and/ or energy consultants. Professionals related to the environmental and energy areas interested in new development opportunities.
Entry requirements	To formalize the registration of the course, send to info@ismedioambiente.com the completed application for admission, the curriculum vitae (CV) or brief professional review, a copy of the ID card and documentation proving the discount requested. Payment of registration fees will be made by transfer to the Banco Santander account number (IBAN ES42 0049 4664 11 2916723790), indicating OL_EGE as a reference.
Qualifications/Certification obtained	Certificate granted by "*Instituto Superior del Medio Ambiente*"
Duration/Structure	250 h (12/02/2020 – 10/07/2020)
Course Fee	780 € (there are discounts applicable for being a former ISM student; for anticipation of enrolment; for being a member of professional colleges and associations in Spain; for being students or unemployed; for enrolment of three or more people from the same company or business group; etc.). Course subsidized by the State Foundation for Training in Employment ("*Fundación Estatal para la Formación en el Empleo*", FUNDAE).
EDUCATIONAL ISSUES	
Course Syllabus – Topics	The course is divided into two modules: 1. **Module I: Energy Audit in the Company** (170h) → In its first module, the course maintains the structure of the content course for conducting Energy Audits recommended by the Royal Decree 56/2016 , of February 12, providing also the

	necessary tools for the reduction of the energy bill in the company.**Energy Fundamentals**: Energy Fundamentals; Energy environment and energy regulation; **Energy analysis of buildings:** Passive building elements; Active building elements; Regulatory framework for energy efficiency in buildings; **Energy analysis of industries:** Energy in industrial processes; Industrial technologies ; **Measurement equipment and data collection:** Planning of measurements and measurement equipment; Evaluation and accounting of energy consumption; Supply and contracting of energy;**Execution of audit, presentation of results and proposals for improvement:** Definition, objectives, methodology and audit sheets; Economic financial analysis. Investment planning. Audit report; Energy saving improvements. Buildings, processes and transport; Grants and subsidies for energy efficiency. **Module II: Energy Management Systems: ISO 50001** (80h) → In its second module the objective is to present the benefits of implementing an Energy Management System in accordance with the new international standard ISO 50001, to know the standard in detail, the objective of its requirements, its philosophy and the different approaches when applying this standard. **Introduction to energy management**: Introduction; ISO standards and Information Processing Tools; Energy Management System; **ISO 50001 requirements**: Energy planning; Implementation and operation; Identification of improvement opportunities and proposal of energy objectives; **Implementation of ISO 50001:** Certification process; Practical cases of implementation of ISO 50001; Example of an SGE Audit. Practical case
Practical training	Practical exercises and tests are carried out to deepen the knowledge acquired in the theoretical part of the course.
Assessment	The evaluation of the student's knowledge is continuous through periodic monitoring of the progress made and their participation in the Tutoring Forums offered by the technological platform that supports the course. In each didactic unit there is a specific evaluation method that allows the teaching team to monitor the student's learning. These evaluation elements are activated on a scheduled basis and must be answered before the established delivery deadline is met.
Training method	Distance training through the ISM Virtual Campus
Training material provided	Online training material; Information; Practical exercises; Verification test
Training facilities	Learning platform that allows the student to access the course content and carry out practices and consultations with the teaching team, as well as having the resources and help they need at any time. The platform is available 24 hours a day and through it the student can request help from the teaching staff at any time. The teaching team will try to reinforce the student's autonomy in their training process, supporting and clarifying all their doubts and difficulties that may arise in the development of the training action. The course is therefore carried out through the different spaces available on the platform, where the student can consult online training material, download information, carry out practical exercises and test the knowledge acquired.
INFORMATION ABOUT THE TRAINERS / TRAINING PROVIDERS	
Trainers Profile	Graduates (Engineers, Environmental Sciences, ...) in the energy field (management systems, environmental services, energy efficiency, renewable energy, ...)
Are the training courses /training providers accredited by a credible authority / certification body?	Yes, Certified by "*Instituto Superior del Medio Ambiente*"
ADDITIONAL INFORMATION	
Contacts	Instituto Superior del Medio Ambiente C/ General Ramírez de Madrid, 8 28020, Madrid T (+34) 91 444 36 43; info@ismedioambiente.com; www.ismedioambiente.com
Location (in case of class training method)	Online – ISM Virtual Campus

Training Course Title:	ENERGY AUDIT IN THE COMPANY
Training Provider Name:	*INSTITUTO SUPERIOR DEL MEDIO AMBIENTE (ISM)*

COURSE OVERVIEW	
Aim (scope of the training)	The objective of this course is to prepare professionals to carry out Energy Audits in companies, in accordance with the UNE-EN 16247 collection of standards. Energy Audits. The course maintains the structure of the content course for conducting Energy Audits recommended by the Royal Decree 56/2016, of February 12, also providing the necessary tools for reducing the energy bill in the company. The objectives are: To know the general concepts and fundamentals of energy; Understand energy supply and procurement operations; Know how to carry out an energy analysis of company buildings and industrial operations; Know the measurement equipment and data collection methodologies; Learn how to conduct energy audits in accordance with the collection of standards UNE-EN 16247. Energy Audits.
Level/Type of training	Energy auditor in the company; Specialized technical training in the environment
Target groups	Environmental managers or technicians from large companies interested in carrying out and/ or supervising the energy audits that their company has to carry out. Environmental and/ or energy consultants. Professionals related to the environmental and energy areas interested in new development opportunities.
Entry requirements	To formalize the registration of the course, send to info@ismedioambiente.com the completed application for admission, the curriculum vitae (CV) or brief professional review, a copy of the ID card and documentation proving the discount requested. Payment of registration fees will be made by transfer bank.
Qualifications/Certification obtained	Certified granted by "*Instituto Superior del Medio Ambiente*"
Duration/Structure	170 h (06/05/2020 – 31/07/2020)
Course Fee	480 € (there are discounts applicable for being a former ISM student; for anticipation of enrolment; for being a member of professional colleges and associations in Spain; for being students or unemployed; for enrolment of three or more people from the same company or business group; etc.).Course subsidized by the State Foundation for Training in Employment ("*Fundación Estatal para la Formación en el Empleo*", FUNDAE).
EDUCATIONAL ISSUES	
Course Syllabus – Topics	Energy fundamentals: Energy fundamentals; Energy environment and energy regulation; Energy analysis of buildings: Passive building; Active building elements; Regulatory framework for energy efficiency in buildings; Energy analysis of industries: Energy in industrial processes; Industrial technologies; Measurement equipment and data collection: Planning of measurements and measurement equipment; Evaluation and accounting of energy consumption; Supply and contracting of energy ; Execution of audit, presentation of results and proposals for improvement: Definition, objectives, methodology and audit sheets; Economic financial analysis. Investment planning. Audit report; Energy saving improvements. Buildings, processes and transport; Grants and subsidies for energy efficiency
Practical training	Practical exercises and tests are carried out to deepen the knowledge acquired in the theoretical part of the course.
Assessment	The evaluation of the student's knowledge is continuous through periodic monitoring of the progress made and their participation in the Tutoring Forums offered by the technological platform that supports the course. In each didactic unit there is a specific evaluation method that allows the teaching team to monitor the student's learning. These evaluation elements are activated on a scheduled basis and must be answered before the established delivery deadline is met.
Training method	Distance training through the ISM Virtual Campus
Training material provided	Online training material; Information; Practical exercises;

	Verification test
Training facilities	Learning platform that allows the student to access the course content and carry out practices and consultations with the teaching team, as well as having the resources and help they need at any time. The platform is available 24 hours a day and through it the student can request help from the teaching staff at any time. The teaching team will try to reinforce the student's autonomy in their training process, supporting and clarifying all their doubts and difficulties that may arise in the development of the training action. The course is therefore carried out through the different spaces available on the platform, where the student can consult online training material, download information, carry out practical exercises and test the knowledge acquired.
INFORMATION ABOUT THE TRAINERS / TRAINING PROVIDERS	
Trainers Profile	Mining Engineer specialized in Energy; senior energy consultant; teachers
Are the training courses /training providers accredited by a credible authority / certification body?	Yes, Certified by "*Instituto Superior del Medio Ambiente*"
ADDITIONAL INFORMATION	
Contacts	Instituto Superior del Medio Ambiente; C/ General Ramírez de Madrid, 8; 28020, Madrid; T (+34) 91 444 36 43; info@ismedioambiente.com; www.ismedioambiente.com
Location (in case of class training method)	Online – ISM Virtual Campus

Training Course Title:	**EXPERT COURSE IN ENERGY AUDITS AND MANAGEMENT**
Training Provider Name:	**ATECYR**
COURSE OVERVIEW	
Aim (scope of the training)	The objectives of this course are: To learn how to carry out an energy audit in the residential, small tertiary, large tertiary and industrial fields, studying the energy saving measures by means of internationally recognized energy simulation programs and following the indications of the UNE EN 16247 standard; To obtain professional competence guaranteed by Atecyr, necessary to undertake any energy audit demanded in the energy efficiency sector with a guarantee and technical solvency, from a simple energy diagnosis of a residential building, to a detailed analysis by computer simulation of the energy efficiency measures of a tertiary building.
Level/Type of training	Specialized technical training in audits and energy management
Target groups	Aimed at professionals with knowledge and experience in the fields of installations and energy efficiency. In particular, all professionals who carry out any activity related to energy service providers; Industrial engineers, technicians, senior and middle managers who carry out their professional activity in the energy sector; Senior and technical architects, upper and middle grades who want to study in depth the energy saving measures that can be achieved through the optimization of the building's facilities; Administration technicians involved in compliance with RD 56/2016 of energy audits; Responsible for the maintenance of neighbouring communities, buildings and industries; Technicians from companies that implement ISO 50001 energy and ISO14001 environmental management systems; Professionals from the commercial world and business development of companies dedicated to engineering, consulting, infrastructure, electricity, renewable energy and, in general, all those that offer energy efficiency services.
Entry requirements	This course is aimed at professionals who have already carried out simple energy audits, and starting from a basic knowledge want to know the particularities of the large tertiary, which could include an office building, a shopping centre, a hotel, a

	school or similar. In the admission process, the training and professional career of the candidate will be evaluated, with the aim of analysing the suitability of their profile for the training program. Registration applications will be processed on a first-come, first-served basis. A photocopy of the ID card and the curriculum vitae must be sent with the application. Once your admission is confirmed, you must send the course registration form to ATECYR, along with the proof of payment of the reservation. The student must attend the classes by videoconference, which will be given during the course schedule. Attendance at face-to-face classes is compulsory. The student, in order to be able to follow the classes, needs to have a computer (not a notebook) with an internet connection to access the WebEx website; speakers; microphone and mouse. In order to obtain the title, it will be necessary to attend at least 80% of the sessions (face-to-face) and pass the objective tests and individual or group work commissioned by the teachers.
Qualifications/Certification obtained	At the end of each course, an accreditation diploma will be awarded to students who have met the minimum requirements of attendance, participation, delivery of exercises and final exam. This diploma will be an expert Auditor and Energy Manager issued by Atecyr, being an Atecyr's own qualification.
Duration/Structure	272 h (72 h will be mandatory face-to-face and 200h will be semi-presential) Classes will be held in Friday afternoon and Saturday morning format. The schedule will be: Fridays from 3:30 p.m. to 5:30 p.m. - 6:00 p.m. to 8:00 p.m. and Saturdays from 9:00 a.m. to 11:00 p.m. - 11:30 a.m. to 1:30 p.m. Each day of classes will consist of 4 hours with a half-hour break.
Course Fee	The cost of each course if done independently is: For permanent and protective partners: Course I: residential and small tertiary →800 €; Course II: large tertiary →2,000 €; Course III: industry →1,200 €; Complete expert course: 3,500 € For non-associates of Atecyr: Course I: residential and small tertiary →1,000 €; Course II: large tertiary →2,500 €; Course III: industry →1,500€; Complete expert course: € 4,500 € When you reserve your place, you must pay 25% of the price of the course, with the remaining 75% being paid before the course begins. The Ministry of Employment and Social Security, through the State Foundation for Training in Employment ("*Fundación Estatal para la Formación en el Empleo*", FUNDAE), helps companies to finance training plans through subsidized credits. Companies can make use of this bonus.
EDUCATIONAL ISSUES	
Course Syllabus – Topics	The training consists of three courses: **1. Course I: Audits in residential and small tertiary (80h) →** The content of this course will enter the fundamentals of thermodynamics, heat and cold production, among others, as well as the study of energy consuming equipment and installations. It will be taught how to make a data collection, how to analyse consumption through billing and different monitoring methods. There is also a course on building energy certification and simulation programs. Specific chapters are included to go deeper into energy saving measures in electrical installations, Sanitary Hot Water (SHW), refrigeration, and ventilation. In order to validate the knowledge acquired, practical cases of success in both residential and small tertiary sectors will be solved, and it will be explained how to make a final energy audit report. Finally, a special session is dedicated to learning how to establish criteria for deciding in a retail case the locations that need to be audited for the sample to be meaningful and how to extrapolate the results. Fundamental knowledge: Units; Psychrometry. Psycro Program; Heat transmission; Thermodynamics; Hydraulics; Fuels and combustion; Compression cycles**;** Typologies of buildings and facilities : Types of buildings; Building classification; Classification of the constructive elements of the thermal envelope of the building: facade walls, walls, roofs, openings, partitions and floors ; Technical parameters of construction elements and their component materials: Transmittance, resistance, conductivity, thermal bridges, infiltrations,... ; Evolution of the regulations regarding thermal insulation requirements for buildings: CT-79, CTE and NZEB ; Types of facilities; Fuel installations; Electrical and

lighting installations; Water supply; Thermal installations, small installations: heating, direct expansion cooling, ventilation and SHW; Renewable energies: biomass, solar thermal and photovoltaic. How to collect data: General data; Energy consumption; Air conditioning and refrigeration; Lighting. Energy contracting and billing: Low voltage electricity contracting; Natural gas, diesel and propane contracting; Biomass contracting; Invoice analysis; Tools for calculating the rate optimization. Measurement equipment and its use: Measurement of fundamental parameters: temperature, pressure, flow, electrical energy, heat and fossil fuels; Measurement of electrical parameters: voltage, current, power factor, active and reactive energy. Energy certification and simulation programs: Difference between an audit and an energy certification; LIDER; CALENER VYP and CERMA; Simplified method: C3X; Simplified method: C3. Study of energy efficiency measures: MAEs: Building envelope (Facade walls; other walls; roofs; floors and ceilings; openings: carpentry and glazing; thermal bridges; air renewal); Electrical installations (Correction of reactive; balancing of circuits); Lighting (Use of natural light; control of lighting; replacement of lamps and/ or luminaires); Heating (Production, distribution, emission and control; preventive maintenance); Refrigeration (Production, distribution, emission and control; preventive maintenance); Ventilation (Recovery; free cooling; equipment); Renewable energies (Biomass, solar thermal and photovoltaic; cogeneration). Multipoint audits: Classification of sites by typology; Significant sample selection; Extrapolation of results. Preparation of the audit report and success stories: Residential building; Community of owners; Business chain

2. **Course II: Grand tertiary audits (136h)** → This course is aimed at professionals who have already carried out simple energy audits, and starting from a basic knowledge, want to know the particularities of the large tertiary sector, which could include an office building, a shopping center, a hotel, a school or similar. The content of this course offers extended knowledge about installations, energy contracting and billing of measurement equipment and its use, energy certification programs for large tertiary, simulation programs with a special chapter dedicated to ENERGY PLUS, study of energy saving measures, implementation of energy management systems based on ISO 50001, the international IPMVP measurement and verification protocol and the necessary methodology to be followed for good data collection and a good reporting. The data collection will be done in a real installation and work will be done on success cases of public buildings, hospitals, hotels, leisure centers and restaurants.

Installations in large tertiary buildings: Electrical installations (transformation centers; electrical boards and distributions; motors; others); Lighting; Renewable energy and cogeneration; Heating, cooling, ventilation and ACS; Water installations; All-air installations; Other thermal facilities: swimming pools and laundry. Energy contracting and billing: Review of low voltage contracting; High voltage contracting; Quarterly data analysis; Calculation tools for hourly and quarterly data. Measurement and use equipment: Measurements of fundamental parameters: temperature, pressure, flow, electrical consumption, thermal and fossil fuels; Measurements in the building and its surroundings (Dry temperature; operating temperature; relative humidity; air velocity; CO_2 concentration; lighting level; transmittance of the enclosures; infiltrations; measurement of external conditions); Measurement of electrical parameters: current, power factor, active and reactive energy; Boiler measurements: direct and indirect method; Measurements in direct expansion machines: direct and indirect method; Examples of measurements with fixed instrumentation in boilers, chillers, air conditioners, solar energy and SHW production; Examples of measurements with portable instrumentation in boilers, chillers, air conditioners, solar energy and DHW production. Analysers of electrical networks and thermographic cameras. Energy certification programs: Difference between an audit and an energy certification; CALENER GT. Simulation programs: Characteristics of the simulation programs (Objectives: Why? When? For what? What program ?; concepts on the thermal model/s of a building (B model/s); concepts on model/s of equipment and systems (HVAC model/s); concepts about B / HVAC definition model/s (D model/s); concepts about D simulation model/s (S model/s); idiosyncrasy of software and information systems)); ENERGY PLUS (Introduction to EnergyPlus models {B, HVAC, D and S} ; guided example: how to enter HVAC model? Options; guided example: calculation of rates, consumption, comfort, etc.; guided example: results; example unguided); Integration of MAEs in ENERGY PLUS . Study of energy efficiency measures in large tertiary buildings: Building envelope (Facade walls; other walls; roofs; floors and ceilings; openings: carpentry and glazing; thermal bridges; air renewal); Lighting (Use of natural light; control of lighting; replacement of lamps and/ or luminaires ; DIALUX program); Electrical installations (Correction of reactive; balancing of circuits; transformation centers; others); Renewable energies and cogeneration (Biomass, solar thermal and photovoltaic; cogeneration);

	Thermal installations 1; Thermal installations 2; MAEs in CALENER GT. Implementation of energy management systems : energy audits or implementation of ISO 50001? ; UNE EN 50001 ; UNE 216301 and 216501 . Measurement and verification protocols : Introduction to measurement and verification (M and V) (Energy services; definitions; differences between audits and M and V procedures; M and V protocols); Determination of savings (Need to estimate energy savings; measurement period prior to saving measures to establish benchmarks; measurement period after executing MAEs; calculation of savings establishing a base reference; methods based on price per useful kWh); Isolated verification of the saving measure (verification of saving with the measurement of a single key parameter; verification of saving with the measurement of all the parameters; practical cases); Verification of the whole installation (verification of savings with the measurement of consumption in the whole installation; verification of savings through calibrated simulation; case studies); Choice of the M&V procedure (factors to consider; cost of the M&V plan; uncertainty in measurements; uncertainty in the estimation of the savings); Measurement and verification options: A, B, C and D . Audit report: Objective; Scope; Regulations; Building description; State of the facilities (Analysis of energy supplies; analysis of production processes; analysis of horizontal and service technologies; measurement and collection of data; energy accounting; measurements of consumption; energy bills; energy indicators; analysis of proposals for improvement; development of improvements; linkage of improvements; linkage of improvements; recommendations and good practises); Action plan. Data collection in a real installation: Ambient conditions; Electrical and lighting; Hydraulic; Heat; Cold. Contracting and financing models. Success stories and practical exercises: Hospital; Leisure and restaurant center; Hotel; Audit + rehabilitation in a singular building **3. Course III: Audits in industry (56h)** → Firstly, this course will lay the foundations for how to correctly perform a mass and energy balance. Later it goes on to analyse different equipment and horizontal processes in the industry, among which are heat exchangers, boilers and furnaces, compressed air, water networks and thermal fluids, insulation, industrial cold production, drying and evaporation, among others. The course goes in depth into how to detect energy saving measures through practical examples and success cases, ensuring the student's understanding. Introduction: mass and energy balance. Energy in processes; Equipment and horizontal processes in industry: Heat exchangers; Industrial boilers and furnaces; Compressed air; Networks of water and thermal fluids: steam, superheated water and organic heat transfer fluids, turbines and transport; Industrial cold production; Drying and evaporation; Thermal and refractory insulation; Regulation and control. Maintenance operations and operations log; Pinch Point; Industry specific MAEs; Success stories and practical exercises
Practical training	Successful case studies on different types of buildings will be solved and it will be explained how to make a final energy audit report. The data collection will be done in a real installation and work will be done on success stories of public buildings, hospitals, hotels, leisure centers and restaurants .
Assessment	At the end of each course there will be an evaluation exam. For those students who take all three courses that complete the expert course: The evaluation will be continuous throughout the training program. It will consider the acquisition, not only of knowledge, but also skills and attitudes. There will be a partial control of knowledge in each module. At the end of the course, students will carry out a project consisting of an audit and the implementation of a management system that the student will have to present and defend before an expert tribunal. To carry out the project, the student will have tutoring sessions to solve doubts.
Training method	The classes will be given via WebEx (videoconferencing system). Students will receive an invitation by mail to participate in the class sessions, they must enter the class identifying themselves with name and surname. The student will be able to follow the classes listening to the teacher's explanations and seeing on screen the powerpoint presentation and the blackboard where the teacher will make the notes that he/she considers. If the student has questions, they should raise their hand (an action available in WebEx) so that the teacher can give way to them and ask them through their microphone so that all the participants can hear them.

	The Association reserves the right to establish a control system for monitoring classes, which will be communicated to the students for the proper running and use of the course.
Training material provided	The course fee includes: **Documentation:** Didactic material with the teachers' presentations to follow the classes, DTIEs technical documents and Energy Efficiency Guides. Computer programs, Diploma and certification of attendance. The student will receive the DTIEs Technical Documents that are needed for the course follow-up by courier. The presentations that the teachers will use will be uploaded a week before on the Atecyr server so that they can be downloaded. Paper documentation: Energy Audit Manual; DTIE 7.03 Data input to the LIDER and CALENER VyP programs; DTIE 7.04 Data entry to the CALENER GT program; DTIE 7.06 Simplified procedures for the certification of newly built homes: CERMA, CE2, CES; DTIE 17.01 Economic Analysis of Efficient Systems and Calculation of Return on Investments. Case studies; DTIE 17.04 Instrumentation and measurement; DTIE 11.03 Energy metering according to RITE in water systems for heating and SHW (Sanitary Hot Water); DTIE 18.01 Energy Rehabilitation of the Thermal Enclosure of Buildings; DTIE 18.03 Integration of Renewable Energies in Building Rehabilitation; DTIE 18.04 Energy audits. Case studies Documentation in digital format: Getting to Net Zero Energy Saving Guide in Food Stores; Energy Saving Guide in Catering Companies; Energy Saving Guide in Residences and Day Care Centers; Energy Saving Guide in Automobile Workshops; Guide to Energy Saving and Efficiency in Hotel Establishments in the Valencian Community; Guide to Energy Saving and Efficiency in Commercial Premises in the Valencian Community; Guide to Energy Saving and Efficiency in the Municipalities of the Valencian Community; Guide to Energy Saving and Efficiency in Municipalities; Guide to Energy Saving and Efficiency in Offices and Dispatches; Guide to Energy Audits in Office Buildings in the Community of Madrid; Guide to Energy Audits in the Hotel Sector of the Community of Madrid; Guide to Energy Audits in Restaurants in the Community of Madrid; Guide to Energy Efficiency in the Andalusian Hotel Sector; Guide to Energy Efficiency in Sports Facilities; Energy Management Guide in the Hotel Sector; Energy Rehabilitation Guide for Residential Buildings; Practical Guide for Environmental Management in Hotels; Guide on Energy Efficiency in Communities of Owners; Guide on Energy Service Companies (ESCO); Municipal Energy Management Guide; Guide To Energy Management; How High Can You Go?; Manual of Good Practices for Improving the Energy Efficiency of Hotels in the Canary Islands; Procedure Manual for Carrying Out Energy Audits in Buildings. Volume 1: Methodology. Instructions. Recommendations; Procedure Manual for Carrying Out Energy Audits in Buildings. Volume 2: Audit type. Technical Sheets; Technical Instruction Manuals for Energy Conservation. Conditioning of premises; Energy Efficient Building Solutions; Energy Conservation Techniques in Industry. Fundamentals and Savings in Operations; Energy Conservation Techniques in Industry. Savings in Processes; Guide to Energy Efficiency in Design and Calculation of Thermal Insulation of Pipes, Devices and Equipment; Guide to Energy Efficiency in Consumption Accounting; Energy Efficiency Guide on Energy Efficiency Periodic Inspection Procedures for Heat Generators;Energy Efficiency Guide on Procedures for the Periodic Inspection of Energy Efficiency procedures for the Determination of the Energy Efficiency for the Determination of the Energy Performance of Water-Cooling Plants and Autonomous Air Treatment Equipment; Commissioning of installations according to RITE; Energy savings through free cooling

	and heat recovery with humidifier in the exhaust air; Hourly frequencies of repetition in temperature. 24-hour interval; Frequency program
Training facilities	The course will be held in the training room of Atecyr's headquarters offices located in street Agastia 112 A in Madrid. The classes will be given via WebEx (videoconferencing system).
INFORMATION ABOUT THE TRAINERS / TRAINING PROVIDERS	
Trainers Profile	The course on Energy Audit and Management in Building and Industry has a teaching staff composed by the most experienced and skilled professionals from the field of audit and energy management. Most of the teaching staff are industrial engineers, as well as some professors specialized in the energy sector.
Are the training courses /training providers accredited by a credible authority / certification body?	Yes, after having taken the exam of each course, the student will obtain a diploma issued by Atecyr, in case of taking the whole course, the diploma will be of Expert Auditor and Energy Manager (Atecyr's own qualification)
ADDITIONAL INFORMATION	
Contacts	ATECYR C/ Agastia 112 A - 28043 Madrid, Technical secretary: Arcadio García; Tel: 91 767 13 55 - Fax: 91 767 06 38, formacion@atecyr.org - www.atecyr.org
Location (in case of class training method)	In the training room of the Atecyr's headquarters offices located at street Agastia 112 A in Madrid. The classes will be given via WebEx (videoconferencing system).
Training or consulting services after the Course	Atecyr has planned a series of specific training courses that can be taken in the same year or in several years. The courses are independent from each other, so it is not necessary to take the first course to take the second one as long as the student starts with sufficient previous knowledge, which will be assessed before admission. The organization of the course reserves the right to cancel it in case of not covering a minimum number of places, in which case the full amount of the course will be returned to the registered people. See special conditions for companies that register more than two participants. Any cancellation of the course reservation must be made in writing. Cancellations made after the course has started or the non - appearance of the student will not lead to any refund. Registration for the course and enrolment is understood to have been carried out and limited to attendance at the corresponding course in which the student is enrolled, being limited this registration to the same course and without this registration entitling the student to attend successive or alternative times to the same course in periods other than the one corresponding to this registration, in which case the student must proceed to a new registration and payment of the corresponding enrolment fee.

Training Course Title:	**ENERGY EFFICIENCY IN LIGHTING SYSTEMS**
Training Provider Name:	***INSTITUTO SUPERIOR DEL MEDIO AMBIENTE (ISM)***
COURSE OVERVIEW	
Aim (scope of the training)	With this course the student will learn to: Know the basic concepts necessary to face the improvements in energy efficiency in lighting both in indoor installations and public lighting; Verify compliance with the regulations on energy efficiency applicable to both in indoor and outdoor lighting; Know and identify the different technologies in lighting systems existing at present; Identify opportunities for improving energy savings in lighting systems; Identify the most common computer tools used for the

	design of lighting installations.
Level/Type of training	Energy Efficiency in Lighting Installations; Specialized technical training in the environment
Target groups	The course is aimed at university students, graduates, bachelors, masters, degrees or technicians linked to the construction or engineering sector, who need to start or complement their knowledge of tools, systems and procedures to improve the energy efficiency of buildings and general facilities.
Entry requirements	To formalize the registration of the course, send to info@ismedioambiente.com the completed application for admission, the curriculum vitae (CV) or brief professional review, a copy of the ID card and documentation proving the discount requested. Payment of the registration fees will be made by transfer to the Banco Santander account number (IBAN ES42 0049 4664 11 2916723790), indicating OL_ ILU as a reference.
Qualifications/Certification obtained	Certificate granted by "*Instituto Superior del Medio Ambiente*"
Duration/Structure	50 h (from 11/03/2020 to 08/04/2020)
Course Fee	200 € (there are discounts applicable for being a former ISM student; for anticipation of enrolment; for being a member of professional colleges and associations in Spain; for being students or unemployed; for enrolment of three or more people from the same company or business group; etc.).Course subsidized by the State Foundation for Training in Employment ("*Fundación Estatal para la Formación en el Empleo*", FUNDAE).
EDUCATIONAL ISSUES	
Course Syllabus – Topics	1. Basic lighting concepts: Magnitudes used in lighting; Lighting systems 2. Energy efficiency in indoor lighting installations: Design criteria of an indoor installation; Regulations, Control systems for indoor installations; Lighting installation design tools; Energy saving measures 3. Energy efficiency in outdoor lighting installations: Design criteria for outdoor lighting; Regulations; Public lighting control systems; Public lighting panels; Audit of a public lighting installation; Energy saving measures
Practical training	Practical exercises and tests are carried out to deepen the knowledge acquired in the theoretical part of the course.
Assessment	The evaluation of the student's knowledge is continuous through periodic monitoring of the progress made and their participation in the Tutoring Forums offered by the technological platform that supports the course. In each didactic unit there is a specific evaluation method that allows the teaching team to monitor the student's learning. These evaluation elements are activated on a scheduled basis and must be answered before the established delivery deadline is met.
Training method	Distance training through the ISM Virtual Campus
Training material provided	Online training material; Information; Practical exercises; Verification test
Training facilities	Learning platform that allows the student to access the course content and carry out practices and consultations with the teaching team, as well as having the resources and help they need at any time. The platform is available 24 hours a day and through it the student can request help from the teaching staff at any time. The teaching team will try to reinforce the student's autonomy in their training process, supporting and clarifying all their doubts and difficulties that may arise in the development of the training action. The course is therefore carried out through the different spaces available on the

	platform, where the student can consult online training material, download information, carry out practical exercises and test the knowledge acquired.
INFORMATION ABOUT THE TRAINERS / TRAINING PROVIDERS	
Trainers Profile	Graduates (Engineers, Environmental Sciences, ...) in the energy field (management systems, environmental services, energy efficiency, renewable energy, ...)
Are the training courses /training providers accredited by a credible authority / certification body?	Yes, Certified by ***"Instituto Superior del Medio Ambiente"***
ADDITIONAL INFORMATION	
Contacts	Instituto Superior del Medio Ambiente C/ General Ramírez de Madrid, 8; 28020, Madrid T (+34) 91 444 36 43, info@ismedioambiente.com; www.ismedioambiente.com
Location (in case of class training method)	Online – ISM Virtual Campus

Training Course Title:	**ENERGY SAVING AND ENERGY EFFICIENCY**
Training Provider Name:	***INSTITUTO SUPERIOR DEL MEDIO AMBIENTE (ISM)***
COURSE OVERVIEW	
Aim (scope of the training)	With this course the student will learn to: Introduce the current energy context and review the existing regulations and legislation in the framework of energy saving and efficiency; Understand the energy market and acquire practical notions of how to manage energy supply bills; Make the student aware of the bases of efficient energy management of companies and institutions; Learn the different techniques and saving measures in buildings and systems for lighting, air conditioning and equipment areas; Identify the quality criteria, methodology and requirements of an energy audit.
Level/Type of training	Savings and energy efficiency, Specialized technical training in Environment
Target groups	The course is aimed at environmental technicians, engineers, architects, municipal and public administration workers, directors, project managers and exceptionally non-professional people who are interested in developing in this sector.
Entry requirements	To formalize the registration of the course, send to info@ismedioambiente.com the completed application for admission, curriculum vitae (CV) or brief professional review, a copy of the ID card and documentation proving the discount requested. Payment of the registration fees will be made by transfer to the Banco Santander account number (IBAN ES 03 0049 4664 1822 1672 0642), indicating OL_AEE as reference.
Qualifications/Certification obtained	Certificate granted by "*Instituto Superior del Medio Ambiente*"
Duration/Structure	100 h (from 01/04/2020 to 22/05/2020)
Course Fee	480 € (there are discounts applicable for being a former ISM student; for anticipation of enrolment; for being a member of professional colleges and associations in Spain; for being students or unemployed; for enrolment of three or more people from the same company or business group; etc.). Course subsidized by the State Foundation for Training in Employment ("*Fundación Estatal para la Formación en el Empleo*", FUNDAE).
EDUCATIONAL ISSUES	
Course Syllabus – Topics	1. Introduction to energy efficiency and regulations: Current energy context; European directives; State strategies and regulations to promote energy efficiency 2. Energy market: Regulatory framework and liberalization of the gas and electricity market; Energy billing; Supply optimization; The natural gas market 3. Energy management: The Energy Manager; Energy Management Systems; Energy Service Companies; Measurement and Verification of Savings 4. Energy audit: Basic concepts; Initial information collection; Definition of energy audit; Data collection; Analysis of data obtained; Report writing; Report review

	5. Analysis of horizontal technologies: Lighting; Air conditioning and Sanitary Hot Water (SHW); Equipment; Other facilities
Practical training	Practical exercises and tests are carried out to deepen the knowledge acquired in the theoretical part of the course.
Assessment	The evaluation of the student's knowledge is continuous through periodic monitoring of the progress made and their participation in the Tutoring Forums offered by the technological platform that supports the course. In each didactic unit there is a specific evaluation method that allows the teaching team to monitor the student's learning. These evaluation elements are activated on a scheduled basis and must be answered before the established delivery deadline is met.
Training method	Distance training through the ISM Virtual Campus
Training material provided	Online training material; Information, Practical exercises, Verification test
Training facilities	Learning platform that allows the student to access the course content and carry out practices and consultations with the teaching team, as well as having the resources and help they need at any time. The platform is available 24 hours a day and through it the student can request help from the teaching staff at any time. The teaching team will try to reinforce the student's autonomy in their training process, supporting and clarifying all their doubts and difficulties that may arise in the development of the training action. The course is therefore carried out through the different spaces available on the platform, where the student can consult online training material, download information, carry out practical exercises and test the knowledge acquired.
INFORMATION ABOUT THE TRAINERS / TRAINING PROVIDERS	
Trainers Profile	Graduates (Engineers, Environmental Sciences, ...) in the energy field (management systems, environmental services, energy efficiency, renewable energy, ...)
Are the training courses /training providers accredited by a credible authority / certification body?	Yes, Certified by "*Instituto Superior del Medio Ambiente*"
ADDITIONAL INFORMATION	
Contacts	Instituto Superior del Medio Ambiente C/ General Ramírez de Madrid, 8; 28020, Madrid; T (+34) 91 444 36 43 info@ismedioambiente.com; www.ismedioambiente.com
Location (in case of class training method)	Online – ISM Virtual Campus

Training Course Title:	**ENERGY AUDITS IN INDUSTRY AND BUILDING**
Training Provider Name:	**CIRCE**
COURSE OVERVIEW	
Aim (scope of the training)	With this course the student will learn to: Carry out the initial assessment of the state of energy supplies; Manage building certification tools; Analyse production processes and horizontal technologies; Know the measurement and verification procedures as a basis for financing and optimization; Expand knowledge of energy accounting; Analyse technical and economic feasibility of MAE´s proposals; Performing audit reports,; Know the elements that make up the UNE-EN-ISO 50001: 2001 Standard; Know the different documents that form the basis of a Quality Management System.
Level/Type of training	Energy audits in industry and building, Specialized technical Training in Environment
Target groups	The course is aimed at university students, graduates, graduates, masters, degrees or technicians.

Entry requirements	-
Qualifications/Certification obtained	Certificate granted by CIRCE and endorsed by ENAC
Duration/Structure	200 h
Course Fee	900 € (discounts are applicable for being a member of Professional Associations and Colleges in Spain; for being students; unemployed; for groups of workers from the same company). Course subsidized by the State Foundation for Training in Employment ("*Fundación Estatal para la Formación en el Empleo*", FUNDAE).
EDUCATIONAL ISSUES	
Course Syllabus – Topics	Energy accounting and economic analysis; Energy supply and economic cost; Electric systems; Motors and drives; Indoor and outdoor lighting; HVAC systems; Boilers and steam systems; Building automation and control systems; Building envelope; Building energy certification; Cogeneration systems and renewable energies; Energy management systems; Energy audits; Measurement and verification.
INFORMATION ABOUT THE TRAINERS / TRAINING PROVIDERS	
Trainers Profile	Graduates (Engineers, Environmental Sciences, ...) in the energy field (management systems, environmental services, energy efficiency, renewable energy, ...)
Are the training courses /training providers accredited by a credible authority / certification body?	Yes, certificate granted by CIRCE and endorsed by ENAC
ADDITIONAL INFORMATION	
Contacts	Fundación CIRCE, Parque Empresarial Dinamiza, Av. Ranillas Edificio 3D, 1ª planta, 50018, Zaragoza, T (+34) 976 97 68 59, circe@fcirce.es, www.fcirce.es
Location (in case of class training method)	Online – Moodle web tool

Training Course Title:	**ENERGY AUDITOR (BUILDING + INDUSTRY)**
Training Provider Name:	***ASOCIACIÓN DE EMPRESAS DE EFICIENCIA ENERGÉTICA* (A3e)**
COURSE OVERVIEW	
Aim (scope of the training)	The main objective of the "Energy Auditor (Building + Industry)" course is to train experts in the performance and supervision of Energy Audits in Buildings and Industries.
Level/Type of training	Energy Auditor (Building + Industry); Energy audits
Target groups	The course is aimed at graduates, engineers, architects, graduates, technical engineers, technical architects, etc.
Entry requirements	Students who have completed the A3e Energy Auditor (Building + Industry) course will be able to request the "Energy Auditor (Building + Industry)" certification granted by the AEC - Spanish Association for Quality *("Asociación Española para la Calidad")*, and the A3e - Association of Energy Efficiency Companies *("Asociación de Empresas de Eficiencia Energética")*. For this purpose, students must request to AEC, attaching the required documentation (photocopy of the university degree in a technical or scientific degree of medium or higher level; photocopy of the certificate accrediting having completed the course "Energy Auditor (Building + Industry)" issued by A3e, proof of having paid the exam fees (€ 300 + VAT)). In addition, the energy efficiency knowledge test convened by A3e must be passed.
Qualifications/Certification obtained	Obtaining the certificate is complementary, optional and independent of the course. The student, after completing the A3e course, will be able to take the exam that leads to the certificate. The completion of the course and the presentation of the end-of-course work (energy audit or case study provided by the course organization) gives students the possibility of taking an exam that, once passed, grants the certificate "Energy Auditor (Building + Industry)" , issued by the AEC (Spanish Association for Quality) and by the

	A3e - Association of Energy Efficiency Companies. This certificate is valid for 4 years.
Duration/Structure	100h to 200h of dedication by the student and 3 months of access to a platform during the course.
Course Fee	The General price of the course "Energy Auditor (Building + Industry)" is 908 €. There is a discount for associates and unemployed (726€). The price without online classes is € 605. Course subsidized by the State Foundation for Training in Employment ("*Fundación Estatal para la Formación en el Empleo*", FUNDAE). Moreover, the price of the certifications for both "Energy Auditor (Building + Industry)" and "Chief Energy Auditor (Building + Industry)" is 363 €.
EDUCATIONAL ISSUES	
Course Syllabus Topics	The course syllabus is adapted to Annex V of RD 56/2016: General concepts of energy fundamentals; Alternative sources of power generation; Optimization of the supply contract; Building energy Structure; Energy in buildings and energy equipment; Energy saving and efficiency measures in buildings; Energy efficiency regulations; Horizontal technologies in industry; Industrial process optimization; Examples of energy saving and efficiency measures in industry; Protocol for the development of an energy audit; Material, means and technical equipment required for the performance of an energy audit; Measurement and verification of savings and consumption management; Energy management systems: ISO 50001 and ESES The content of the online classes is: Class I on-line: Introduction (audits , auditor profile, etc.); Types of documents: diagnosis, audit and ESE audit; Applicable legislation (Directive 2012/27 / EU, RD 56/2016, UNE-EN 16247). Class II on-line : Phases of an audit; Example: energy balance Audit report. Class III on-line: Measurement equipment; Energy consumption. Management. Class IV on-line: Energy billing , electricity consumption curves; Example: optimization of the electric bill. Class V on-line: Horizontal technologies in the industry; Example: MAEs industry. Class VI on-line: Energy Saving Measures (*MAEs*/ESMs) in industry and building; Example: MAEs edification or common. Class VII online: Measurement and Verification protocols (IPMV and others); Example: baseline resolution/ optimization. Class VIII on-line: Doubts case study. Consumption distribution; AEC exam questions
Practical training	The course includes self-assessments, access to a forum, additional documentation and ongoing support from teachers
Assessment	The student must develop an energy audit and present it at the end of the training action.
Training method	The course includes 8 online classes of approximately 2 hours each, weekly.
Training material provided	Self - evaluations, Additional documentation
Training facilities	On-line platform
INFORMATION ABOUT THE TRAINERS / TRAINING PROVIDERS	
Trainers Profile	Classes are given by A3e-accredited teachers. They are professionals from A3e member companies, with extensive experience in conducting audits and with a long career in teaching. The professional profile of the teachers are higher graduates (Engineers, Environmental Sciences, ...) in the energy field (management systems, environmental services, energy efficiency, renewable energy, ...)
Certified trainers (Yes / No)	Yes, teachers accredited by A3e
Are the training courses /training providers accredited by a credible authority / certification body?	Yes, by the Association of Energy Efficiency Companies
ADDITIONAL INFORMATION	
Contacts	Asociación de Empresas de Eficiencia Energética Calle Agustín de Foxá 25, Planta 1, Oficina 1, 28036 Madrid,, 917 88 57 24, info@asociacion3e.org
Course frequency	2 convocatorias por año
Location (in case of class training method)	On-line training
Training or consulting services after the Course	If the student also accredits an experience of more than 3 years carrying out energy audits, and the accomplishment of more than 20 energy audits, the student will be able to obtain the certificate "Chief Auditor Energy (Building+ Industry) ".

Training Course Title:	ENERGY AUDITS (010709)
Training Provider Name:	COGITI
COURSE OVERVIEW	
Aim (scope of the training)	The objectives of the course are: Learn the methodology to carry out an energy audit, Take real data in buildings, Treat the field data, Optimize energy systems, Calculate energy savings and economic feasibility of proposals, Perform audit reports, Acquire knowledge enough to be able to carry out an energy audit of buildings.
Level/Type of training	Energy audits; Level: intermediate (previous basic training is required by university engineering degree)
Target groups	The course is aimed at engineers
Entry requirements	It will be necessary to be at least 8 students for the course to take place. The pre - enrollment must be formalized on the online platform www.cogitiformacion.es and then make the payment (by payment gateway, by card, by bank transfer or deposit). A minimum university degree in Engineering is required.
Qualifications/Certification obtained	COGITI course completion certificate
Duration/Structure	100h (8 weeks)
Course Fee	400 € (there are discounts applicable for being members of COGITI; for being students of entities that have agreements with COGITI and discounts for companies). Course subsidized by the State Foundation for Training in Employment ("*Fundación Estatal para la Formación en el Empleo*", FUNDAE).
EDUCATIONAL ISSUES	
Course Syllabus – Topics	Energy audits. Introduction: Introduction; European directive on energy efficiency and its proposal for transposition in Spain; Definitions; UNE 216501: 2009 Energy Audits and the new UNE-EN 16247; Energy accounting: Energy analysis; Economic analysis; Energy inventory: Lighting; Thermal envelope; Electric system; Fuel system; Thermal conditioning; SHW; Ventilation; Other facilities; Measurement and Instruments of Energy Audits: Definitions; Lighting measurements; Electrical measurements; Temperature measurements; Flow measurement; Combustion analysis; Optimization of energy efficiency (I). Content of an improvement proposal: Stages of an energy-saving measure; Content of an improvement proposal: Technical description, Energy evaluation and Financial evaluation; Optimization of energy efficiency (II). Energy saving measures (*MAEs*/ESMs): MAE in lighting (lighting control); MAE in thermal envelope (change of windows; insulation); MAE in heat production (change of boiler for a more efficient one; change of fuel); MAE in cold production (change of chiller or heat pump; geothermal heat pump) ; MAE in air conditioning: limitation of hours and temperatures; MAE in production of SHW (solar thermal energy; heat pump thermoelectric exchange; compressed air heat recovery); MAE in ventilation: heat recovery from the outside air; MAE in electric motors (exchange of electric motor for a more efficient one; frequency converter); MAE in pipeline distribution: pipe insulation; MAE in electrical self-consumption (photovoltaic energy; hydraulic energy); MAE in electrical quality: capacitor bank; Case study: Carrying out a real audit throughout the course with the knowledge acquired during the course.
Practical training	Conducting case studies and questionnaires
Assessment	In order to obtain the certificate of completion of the course the student will have to exceed the minimum targets set by the teacher (overcoming evaluation questionnaires, case studies, participation, etc.).
Training method	The course will take place on the virtual campus of the COGITI e-learning training platform where the content of the courses, the forum and tutorials will be available. As the training is e-learning, students will follow the different topics proposed in the course at the pace they can, and at the times that best suit their schedule.
Training material provided	Questionnaires, Documentation, Case studies
Training facilities	The course will be taught entirely via the Internet on the COGITI Training Platform

INFORMATION ABOUT THE TRAINERS / TRAINING PROVIDERS	
Trainers Profile	Industrial engineers (superiors and technicians) in the energy field
Certified trainers (Yes / No)	Yes
Are the training courses /training providers accredited by a credible authority / certification body?	Yes, teachers accredited by the CEM certification (Certified Energy Manager) of the AEE (Association Energy Engineer) and by the CMVP (Certified in Measurement and Verification Professional) certification of the AEE.
ADDITIONAL INFORMATION	
Contacts	COGITI – Consejo General de la Ingeniería Técnica Industrial 985 73 28 91, www.cogitiformacion.es, secretaria@cogitiformacion.es
Location (in case of class training method)	On-line mode

Training Course Title:	**M-31 ENERGY AUDITS**
Training Provider Name:	**AENOR**
COURSE OVERVIEW	
Aim (scope of the training)	The objectives of the course are: To understand the aspects related to an energy audit: which facilities to audit, phases and methodology of the audit, tools for its execution, interpretation of the results and presentation of conclusions; To deepen in the energy aspects that are analysed in an energy audit; To know the best available technologies in terms of energy efficiency and saving; To understand the energy audit as a first step in the implementation of an energy efficiency management system
Level/Type of training	Energy audits
Target groups	The course is aimed at technicians and managers of energy efficiency projects, technical consulting professionals, facility maintenance staff, people interested in developing their professional careers in the energy auditing sector and/ or who require training in this area.
Entry requirements	-
Qualifications/Certification obtained	Certificate endorsed by AENOR
Duration/Structure	14h (06/05/2020 from 9:00h to 18:00h and 07/05/2020 from 9:00h to 18:00h)
Course Fee	835€ (the course can be discounted)
EDUCATIONAL ISSUES	
Course Syllabus – Topics	Introduction to the energy audit: Reasons to carry out an energy audit; Energy legislative framework; Energy service companies (ESCOs); Basic concepts; EN 16247 standards; Energy audit methodology: Analysis of energy supplies; Analysis of production processes; Analysis of horizontal technologies and services; Measurement and data collection. Planning of the measurement campaign. Equipment required; Carrying out an energy accounting: Methodology for carrying it out; Identification of energy factors; Analysis of improvement proposals: Ways for improvement; Best available technologies; Development and evaluation of improvements; Concatenation of improvements; Recommendations and good practices; Preparation of the audit report: Structure of the document; Minimum contents; Case studies
Practical training	Case studies
Training material provided	Documentation, information
Training facilities	Face-to-face modality/ Possibility of teaching in your company
ADDITIONAL INFORMATION	
Contacts	AENOR C/ Génova, 6. 28004 Madrid, 914 326 000, info@aenor.com
Location (in case of class training method)	Face-to-face modality/ Possibility of teaching in your company

Training Course Title:	PRACTICAL COURSE OF CONDUCTING ENERGY AUDITS
Training Provider Name:	RENOVETEC
COURSE OVERVIEW	
Aim (scope of the training)	The objectives of the course are for attendees to learn to carry out energy audits from a practical point of view, using the necessary tools and making examples.
Level/Type of training	Energy audits Medium level. (A university degree is required, but no prior knowledge of energy audits is necessary)
Target groups	The course is aimed at industrial engineers and technical engineers interested in energy audits
Duration/Structure	24h (25/05/2020 to 27/05/2020)
Course Fee	726€ (there are discounts for recent graduates and for the unemployed) The course is subsidized by FUNDAE ("*Fundación Estatal para la Formación en el Empleo")*
EDUCATIONAL ISSUES	
Course Syllabus – Topics	Energy management in industry: Energy management in industry; The energy manager; Energy audit; Valuation of energy costs; Profitability of a saving measure; Energy management systems Optimization of energy in industry: Maximization of added value; Return on investments; Proposals for general measures and energy recommendations; Improvements or savings measures by type of application; Cogeneration; Methodology in an energy audit: Phases of performance of an audit; Material, means and equipment necessary for the audit; Previous data; Data collection and measurements; Energy analysis; Proposals and conclusions; Case studies in an industrial company: Preliminary data; Data collection and measurements; Energy analysis; Proposals and conclusions
Practical training	Case studies
Training method	Acquisition of theoretical concepts; putting concepts into practice, using tools and making case studies and examples.
Training material provided	Colour book, Workbook with self-test questionnaires
Training facilities	Madrid/ Company facilities
INFORMATION ABOUT THE TRAINERS / TRAINING PROVIDERS	
Trainers Profile	Higher Degree in Chemical Sciences and author of books on industrial, energy, renewable energy facilities, etc.
ADDITIONAL INFORMATION	
Location (in case of class training method)	Madrid/ Company facilities

Training Course Title:	COURSE OF SAVING AND ENERGY EFFICIENCY IN BUILDING
Training Provider Name:	CAMPUS SEAS
COURSE OVERVIEW	
Aim (scope of the training)	The Course on Energy Saving and Efficiency in Buildings studies the general concepts of energy saving, energy audit tools, legislation, energy certification criteria in force in Spain and the software used. Likewise, it is studied how the integration of renewable energies in buildings increases their importance for optimal certification. At the end of the studies you will be able to: Know the guidelines for conducting energy audits, inspections and certifications; Interpret the Technical Building Code regarding more efficient systems and facilities; Perform the calculation to know the energy demand of a building and obtain the

	calculation of the energy efficiency of a building; Apply the necessary methods to optimize an energy certification of new buildings and existing ones; Manage the LIDER, CALENER VYP, CALENER GT (HULC), CE3X and CE3 energy certification software to qualify the energy efficiency of a building; Select renewable energy technologies, for better efficiency in a building; Know the most efficient tools, such as energy audits, certification processes and the best procedures to optimize the use and integration of renewable energy in current or new buildings; Perform energy certifications if you meet the requirements for certification established by Royal Decree 235/2013. The Energy Saving and Efficiency in Building Course is adapted to the requirements of the new *CTE*/TBC (technical building code) dated September 2013
Level/Type of training	Renewable energy, Energy efficiency in buildings, Optimal savings
Target groups	Graduates who want to learn how to calculate energy efficiency in buildings and how to optimally save in buildings
Entry requirements	One of the following requirements must be met to access one of the technical courses: Being over 18 years old; Be in possession of the title of Bachelor, European Baccalaureate, International Baccalaureate, Be in possession of the title of Higher Technician in Vocational Training (FP; *Formación Profesional*), or Higher Technician in Plastic Arts and Design or Higher Sports Technician; Being over 25 years old with at least 1 year of accredited professional experience related to the content of the training; Being a university graduate
Qualifications/Certification obtained	You will receive your own university degree issued directly by San Jorge University, with 6 ECTS credits
Duration/Structure	150 h (6 ECTS)
EDUCATIONAL ISSUES	
Course Syllabus – Topics	General concepts in energy savings and efficiency: General concepts in energy saving and efficiency; Energy audits : Introduction to energy audit. Carrying out an energy audit; Energy certification: Energy regulations in buildings. Elements of certification. Qualifying procedure; Unified tool LIDER - CALENER (HULC) I : Introduction to the HULC program. Geometric, constructive and operational definition. Calculation, results and generation of the verification report. Viewing of the report and printing of results; Unified Tool LIDER - CALENER (HULC) II: Calener GT. Calener VYP; CE3X: How to download the program. Obtaining the building data. Energy Rating. Improvement measures. Economic analysis. Example residential building. Example of individual house within a block. Small tertiary and large tertiary. Conclusions; CE3: How to download the program. Obtaining the building data. Energy Rating. Improvement measures. Certification of a residential building with the CE3 program. Individual housing within a block. Small tertiary and large tertiary. Certification of a large tertiary. ; Renewable energy in buildings: Energy consumption in Spanish homes. Building saving measures. Wind energy integration in buildings. Integration of active solar thermal systems in buildings. Biomass integration in buildings.
Practical training	Use energy audit tools and programs to rate energy efficiency
Assessment	No exam
Training method	Live classes through Webinars, Online training through your own virtual classroom
Training material provided	Online training material, Practical exercises, Training with computer programs, Guaranteed company practices
Training facilities	Online virtual classroom
INFORMATION ABOUT THE TRAINERS / TRAINING PROVIDERS	
Are the training courses /training providers accredited by a credible authority / certification body?	Yes, you will receive your own university degree issued directly by Universidad San Jorge, with 6 ECTS credits
ADDITIONAL INFORMATION	
Contacts	Campus SEAS, C/ Violeta Parra 9, 50015 Zaragoza, Tel. 900 011 677
Location (in case of class training method)	Online

Training or consulting services after the Course	Guaranteed internships and permanent access to the job bank; To be part of the SEAS Alumni community allowing access to always updated materials, contact with more than 50,000 alumni and other advantages; Qualifying training for workers through the State Foundation for Training in Employment ("*Fundación Estatal para la Formación en el Empleo*", Fundae), Live Webinar Classes

Training Course Title:	**ENERGY CERTIFICATION OF BUILDINGS. GENERAL METHOD WITH LEADER - CALENER (HULC)**
Training Provider Name:	***INSTITUTO SUPERIOR DEL MEDIO AMBIENTE (ISM)***
COURSE OVERVIEW	
Aim (scope of the training)	With this course the student will learn to: Know the technical aspects established in the CTE DB-HE and RITE, Start managing the HULC and VyP tool, Know the basic concepts of calculation for the thermal envelope and facilities, Collect all the necessary data, and application regulations (climate zone, ventilation, lighting, minimum solar fraction, etc.) for the introduction of input variables for the definition of a building in the program, Know the calculation methodologies and know how to interpret the results obtained.
Level/Type of training	Energy Certification of buildings. General method with LIDER - CALENER (HULC) Specialized Technical Training in Environment
Target groups	The course is aimed at construction professionals who are involved in both new construction and major renovation projects. The ideal profile for this course is designers and consultants of sustainability and energy saving in buildings; Engineers, Architects, Technical Architects, building energy consultants and other building professionals. This course will help those technicians who are responsible for the design of the execution or rehabilitation projects in relation to the Energy Saving chapters.
Entry requirements	To formalize the registration of the course, send to info@ismedioambiente.com the completed application for admission, the curriculum vitae (CV) or brief professional review, a copy of the ID card and documentation proving the discount requested. Payment of registration fees will be made by transfer to the Banco Santander account number (IBAN ES42 0049 4664 11 2916723790), indicating OL_HULC as a reference.
Qualifications/Certification obtained	Certificate granted by "*Instituto Superior del Medio Ambiente*"
Duration/Structure	80 h (from 26/02/2020 to 14/04/2020)
Course Fee	320 € (there are discounts applicable for being a former ISM student; for anticipation of enrolment; for being a member of professional colleges and associations in Spain; for being students or unemployed; for enrolment of three or more people from the same company or business group; etc.). Course subsidized by the State Foundation for Training in Employment ("*Fundación Estatal para la Formación en el Empleo*", FUNDAE).
EDUCATIONAL ISSUES	
Course Syllabus – Topics	Introduction: Background; Origin of the certification; Methods used: Differences; CTE-HE energy certification and verification; Data, analysis and procedure: Download and installation of the HULC program; Scope of the program; Start of a project: General Data; Database management; Calculation of heating and cooling demands: HE 1 verification; Definition of systems: consumption calculation and HE0 verification; Administrative documentation; Practical exercise: Energy rating of a single-family home; Practical exercise: Energy rating of an individual house in a block; Practical exercise: Energy rating of a block of flats; Practical exercise: Energy rating of a commercial premises
Practical training	Practical exercises and tests are carried out to deepen the knowledge acquired in the theoretical part of the course.

	The course is fundamentally practical and from the beginning the management of the program will be addressed.
Assessment	The evaluation of the student's knowledge is continuous through periodic monitoring of the progress made and their participation in the Tutoring Forums offered by the technological platform that supports the course. In each didactic unit there is a specific evaluation method that allows the teaching team to monitor the student's learning. These evaluation elements are activated on a scheduled basis and must be answered before the established delivery deadline is met.
Training method	Distance training through the ISM Virtual Campus
Training material provided	Online training material, Information, Practical exercises, Verification test
Training facilities	Learning platform that allows the student to access the course content and carry out practices and consultations with the teaching team, as well as having the resources and help they need at any time. The platform is available 24 hours a day and through it the student can request help from the teaching staff at any time. The teaching team will try to reinforce the student's autonomy in their training process, supporting and clarifying all their doubts and difficulties that may arise in the development of the training action. The course is therefore carried out through the different spaces available on the platform, where the student can consult online training material, download information, carry out practical exercises and test the knowledge acquired.
INFORMATION ABOUT THE TRAINERS / TRAINING PROVIDERS	
Trainers Profile	Graduates (Engineers, Environmental Sciences, ...) in the energy field (management systems, environmental services, energy efficiency, renewable energy, ...)
Are the training courses /training providers accredited by a credible authority / certification body?	Yes, Certified by *"Instituto Superior del Medio Ambiente"*
ADDITIONAL INFORMATION	
Contacts	Instituto Superior del Medio Ambiente C/ General Ramírez de Madrid, 8, 28020, Madrid, T (+34) 91 444 36 43, info@ismedioambiente.com, www.ismedioambiente.com
Location (in case of class training method)	Online – ISM Virtual Campus

Training Course Title:	**ENERGY CERTIFICATION OF EXISTING BUILDINGS. OPTION SIMPLIFIED WITH CE3 AND CE3X**
Training Provider Name:	***INSTITUTO SUPERIOR DEL MEDIO AMBIENTE (ISM)***
COURSE OVERVIEW	
Aim (scope of the training)	With this course the student will learn to: Achieve theoretical and practical knowledge on the two CE3 and CE3X procedures published for the energy certification of existing residential, small and medium tertiary as well as large tertiary buildings, Know the applicable regulations, Handle CE3 and CE3X tools properly, Obtain the energy efficiency rating according to current regulations
Level/Type of training	Energy Certification of existing buildings. Simplified option with CE3 and CE3X Specialized Technical Training in Environment
Target groups	The course is aimed at professionals in construction, real estate, engineering, environmental and energy consultancy sectors.
Entry requirements	To formalize the registration of the course, send to info@ismedioambiente.com the completed application for admission, the curriculum vitae (CV) or brief professional review, a copy of the ID card and documentation proving the discount requested. Payment of registration fees will be made by bank transfer.

Qualifications/Certification obtained	Certificate granted by "*Instituto Superior del Medio Ambiente*"
Duration/Structure	70 h (from 19/02/2020 to 03/04/2020)
Course Fee	280 € (there are discounts applicable for being a former ISM student; for anticipation of enrolment; for being a member of professional colleges and associations in Spain; for being students or unemployed; for enrolment of three or more people from the same company or business group; etc.).Course subsidized by the State Foundation for Training in Employment ("*Fundación Estatal para la Formación en el Empleo*", FUNDAE).
EDUCATIONAL ISSUES	
Course Syllabus – Topics	Introduction and background: Introduction; Background: RD 47/2007 Energy Certification and Directive 2010/31/EU; Royal Decree 235/2013, of April 5, which approves the basic procedure for the certification of the energy performance of buildings; Data, analysis and procedure: Download and installation of CE3X and CE3 programs; Initial data; Analysis of thermal enclosure and facilities; Certification procedure; Improvement measures; Single-family insulated house: Practical exercise 1. Energy rating of a single-family insulated house with CE3X; Practical exercise 2. Energy rating of a single-family insulated house with CE3; House included in block: Practical exercise 3. Energy rating of a house included in block with CE3X; New construction housing block: Practical exercise 4. Energy rating of a new construction housing with CE3X; Business premises. Small tertiary: Practical exercise 5. Energy rating of commercial premises for hairdressing. Small tertiary with CE3X; Business premises. Grand Tertiary: Practical exercise 6. Energy rating of an integrated training center. Large tertiary with CE3X
Practical training	Practical exercises and tests are carried out to deepen the knowledge acquired in the theoretical part of the course. The course is fundamentally practical and from the beginning the management of the program will be addressed.
Assessment	The evaluation of the student's knowledge is continuous through periodic monitoring of the progress made and their participation in the Tutoring Forums offered by the technological platform that supports the course. In each didactic unit there is a specific evaluation method that allows the teaching team to monitor the student's learning. These evaluation elements are activated on a scheduled basis and must be answered before the established delivery deadline is met.
Training method	Distance training through the ISM Virtual Campus
Training material provided	Online training material, Information, Practical exercises, Verification test
Training facilities	Learning platform that allows the student to access the course content and carry out practices and consultations with the teaching team, as well as having the resources and help they need at any time. The platform is available 24 hours a day and through it the student can request help from the teaching staff at any time. The teaching team will try to reinforce the student's autonomy in their training process, supporting and clarifying all their doubts and difficulties that may arise in the development of the training action. The course is therefore carried out through the different spaces available on the platform, where the student can consult online training material, download information, carry out practical exercises and test the knowledge acquired.
INFORMATION ABOUT THE TRAINERS / TRAINING PROVIDERS	
Trainers Profile	Graduates (Engineers, Environmental Sciences, ...) in the energy field (management systems, environmental services, energy efficiency, renewable energy, ...)

Are the training courses /training providers accredited by a credible authority / certification body?	Yes, certified by *"Instituto Superior del Medio Ambiente"*
ADDITIONAL INFORMATION	
Contacts	Instituto Superior del Medio Ambiente C/ General Ramírez de Madrid, 8, 28020, Madrid, T (+34) 91 444 36 43 info@ismedioambiente.com, www.ismedioambiente.com
Location (in case of class training method)	Online – ISM Virtual Campus

Training Course Title:	**BUILDING ENERGY AUDIT**
Training Provider Name:	***INSTITUTO SUPERIOR DEL MEDIO AMBIENTE (ISM)***
COURSE OVERVIEW	
Aim (scope of the training)	With this course the student will learn to: Acquire the theoretical and practical knowledge necessary to carry out, in a methodical and rational way, the inspection, analysis and evaluation of energy systems, both active (facilities) and passive (envelope), and of the habits of use of a building; Train to plan energy saving measures that are technically and economically viable; Review the legislation applicable to energy installations in buildings; Provide knowledge on the management of measurement and monitoring equipment; Know the step-by-step methodology for conducting an energy audit and applying the savings measurement and verification procedures.
Level/Type of training	Building energy audit, Specialized Technical Training in Environment
Target groups	The course is aimed at university students, graduates, graduates, masters, degrees or technicians related to the construction or engineering sector, who need to start or complement their knowledge of tools, systems and procedures for energy auditing of buildings.
Entry requirements	To formalize the registration of the course, send to info@ismedioambiente.com the completed application for admission, the curriculum vitae (CV) or brief professional review, a copy of the ID card and documentation proving the discount requested. Payment of registration fees will be made by transfer to the Banco Santander account number (IBAN ES42 0049 4664 11 2916723790), indicating OL_ AEE as reference.
Qualifications/Certification obtained	Certificate granted by "*Instituto Superior del Medio Ambiente*"
Duration/Structure	150 h (from 18/03/2020 to 29/05/2020)
Course Fee	420 € (there are discounts applicable for being a former ISM student; for anticipation of enrolment; for being a member of professional colleges and associations in Spain; for being students or unemployed; for enrolment of three or more people from the same company or business group; etc.). Course subsidized by the State Foundation for Training in Employment ("*Fundación Estatal para la Formación en el Empleo*", FUNDAE).
EDUCATIONAL ISSUES	
Course Syllabus – Topics	Introduction: Energy and environmental environment (international context, European context and national context); Energy regulations; Regulatory framework for energy efficiency in buildings (PNAE, CTE, RITE, CEE); Energy consumption in buildings (tertiary sector, residential sector); Technical foundations and basic concepts: Basic concepts related to energy efficiency; Passive elements (thermal envelope and building elements); Active elements (energy supplies, horizontal technologies and services); Building energy audit: Definition and objectives; Measurement and data collection methodology (coding, cards and questionnaires, planning, measurements and measurement equipment); Analysis of passive elements; Analysis of active elements; Information processing: Identification of energy factors; Implementation of energy accounting; Help tools for information processing; Data evaluation and energy saving improvements: Analysis of energy billing (electricity market, fossil fuel market); Energy saving improvements in passive elements (insulation, glazing,

	bioclimatic architecture); Energy saving improvements in services (heating, SHW, air conditioning, ventilation, lighting, lifts and office automation); Energy saving improvements through renewable energy (solar, wind, biomass and geothermal); Cogeneration systems for buildings; Audit report: Action plan; Economic financial analysis; Minimum content (description of audited facilities, energy saving measures, investment planning, summary of savings and investments); Action plan: Recommendations and good practices (case studies); Aid and subsidies (energy organizations and agencies, latest public aid); Energy management system (definition, UNE-EN 16001 - 2010); Sustainability (LEED and BREEAM registries); Practical case: Energy Audit of the practical case
Practical training	Practical exercises and tests are carried out to deepen the knowledge acquired in the theoretical part of the course.
Assessment	The evaluation of the student's knowledge is continuous through periodic monitoring of the progress made and their participation in the Tutoring Forums offered by the technological platform that supports the course. In each didactic unit there is a specific evaluation method that allows the teaching team to monitor the student's learning. These evaluation elements are activated on a scheduled basis and must be answered before the established delivery deadline is met.
Training method	Distance through the ISM Virtual Campus
Training material provided	Online training material; Information; Practical exercises; Verification test
Training facilities	Learning platform that allows the student to access the course content and carry out practices and consultations with the teaching team, as well as having the resources and help they need at any time. The platform is available 24 hours a day and through it the student can request help from the teaching staff at any time. The teaching team will try to reinforce the student's autonomy in their training process, supporting and clarifying all their doubts and difficulties that may arise in the development of the training action. The course is therefore carried out through the different spaces available on the platform, where the student can consult online training material, download information, carry out practical exercises and test the knowledge acquired.
INFORMATION ABOUT THE TRAINERS / TRAINING PROVIDERS	
Trainers Profile	Graduates (Engineers, Environmental Sciences, ...) in the energy field (management systems, environmental services, energy efficiency, renewable energy, ...)
Are the training courses /training providers accredited by a credible authority / certification body?	Yes, Certified by *"Instituto Superior del Medio Ambiente"*
ADDITIONAL INFORMATION	
Contacts	Instituto Superior del Medio Ambiente C/ General Ramírez de Madrid, 8, 28020, Madrid, T (+34) 91 444 36 43, info@ismedioambiente.com, www.ismedioambiente.com
Location (in case of class training method)	Online – ISM Virtual Campus

Training Course Title:	**ENERGY EFFICIENCY OF BUILDINGS**
Training Provider Name:	**MINISTRY OF LABOUR AND SOCIAL ECONOMY**
COURSE OVERVIEW	
Aim (scope of the training)	With this course the student will learn to: Manage the efficient use of energy; Evaluate the efficiency of energy and water installations in buildings; Collaborate in the building's energy certification process; Determine the feasibility of implementing solar installations; Promote the efficient use of energy; Make improvement proposals with the required quality, complying with current regulations and in safety conditions.

Level/Type of training	Energy efficiency of buildings; Energy efficiency; Energy and water; Level 3 Professional Certificate
Target groups	The course is aimed at graduates, engineers, architects, graduates, technical engineers, technical architects, etc.
Entry requirements	It is required to have a minimum of 1 year of professional experience and to have any of the following qualifications: graduate, engineer, architect, graduate, technical engineer, technical architect or the corresponding degree.
Qualifications/Certification obtained	ENACC0108 Professional Certificate of Energy Efficiency of Buildings (RD 643/2011, May 9)
Duration/Structure	800h
EDUCATIONAL ISSUES	
Course Syllabus – Topics	Energy efficiency in heating and SHW installations in buildings; Energy efficiency in air conditioning installations in buildings; Energy efficiency in indoor and outdoor lighting installations; Maintenance and improvement of facilities in buildings; Edification and energy efficiency in buildings; Energy rating of buildings; Computer programs in energy efficiency in buildings; Efficient water supply and sanitation facilities in buildings; Efficient maintenance in water supply and sanitation facilities in buildings; Determination of solar potential; Energy needs and proposals for solar installations
Training method	Face-to-face
INFORMATION ABOUT THE TRAINERS / TRAINING PROVIDERS	
Are the training courses /training providers accredited by a credible authority / certification body?	*Ministerio de Trabajo y Economía Social* (Ministry of Labour and Social Economy)
ADDITIONAL INFORMATION	
Location (in case of class training method)	Different autonomous regions centers in Spain Consult in www.sede.sepe.gob.es/especialidadesformativas

Training Course Title:	**SPECIALIST IN INTEGRATED MANAGEMENT SYSTEMS: QUALITY, ENVIRONMENT, ENERGY AND PRL**
Training Provider Name:	***INSTITUTO SUPERIOR DEL MEDIO AMBIENTE (ISM)***
COURSE OVERVIEW	
Aim (scope of the training)	With this course the student will learn to: Analyse the main management challenges in the company and the benefits of adopting standard management models; Evaluate the advantages and disadvantages of the implementation and certification of integrated management systems; Interpret the reference standards for quality management (ISO9001: 2015), the environment (ISO14001: 2015), energy (ISO50001: 2018) and the prevention of occupational risks (ISO45001: 2018); Know the requirements of the different sectoral management systems and the possibilities of integration into a single global system; Know the different types of audits and the standard that marks the guidelines for the Audit of management systems (ISO 19011: 2018); Study the documentary needs and options for the optimization of the integrated management documentary subsystem; Enhance professional skills and technical training to identify opportunities for continuous improvement and propose personalized management solutions.
Level/Type of training	Specialist in integrated management systems: quality, environment, energy and PRL Specialized Technical Training in Environment

Target groups	The course is aimed at university graduates without work experience and quality technicians, the environment or those responsible for the prevention of occupational hazards who are going to assume responsibilities in an Integrated Management System or want to deepen their knowledge of the UNE-EN ISO 9001 Standards, 14001, EMAS Regulation, ISO 50001 and ISO45001, and in the strategies for the design, implementation, integration and auditing of systems and optimization of integrated management in the company, as well as anyone interested in acquiring training that they can develop in their professional field in the future.
Entry requirements	To formalize the registration of the course, send to info@ismedioambiente.com the completed application for admission, the curriculum vitae (CV) or brief professional review, a copy of the ID card and documentation proving the discount requested. Payment of registration fees will be made by transfer to the Banco Santander account number (IBAN ES42 0049 4664 11 2916723790), indicating OL_ESI as a reference.
Qualifications/Certification obtained	Certificate granted by "*Instituto Superior del Medio Ambiente*"
Duration/Structure	250 h (from 14/04/2020 to 25/09/2020)
Course Fee	650 € (there are discounts applicable for being a former ISM student; for anticipation of enrolment; for being a member of professional associations and colleges in Spain; for being students or unemployed; for enrolment of three or more people from the same company or business group ; etc.). Course subsidized by the State Foundation for Training in Employment ("*Fundación Estatal para la Formación en el Empleo*", FUNDAE).
EDUCATIONAL ISSUES	
Course Syllabus Topics	**Module I: Integrated Management in the Company:** Key aspects of management in the company : Control of resources and processes; Legal and other requirements; Organization of work; Continuous improvement; Standardized Management Systems: Standardization of Management Systems; Infrastructure for Quality and Industrial Safety; Standardized Systems of Interest in Company Management; Management Systems Integration: The need for Management Systems integration; Key aspects for integration; Integration of Management Systems according to UNE 66177: 2005**; Module II: Quality Management:** Quality Management: History of Quality; Stages and Definitions of Quality; Quality and non-quality costs; Quality Application; Importance of Quality Management Systems; Standard 9001: History of Standard 9001; Familiar with ISO 9000 Standards; ISO 9001 and other Quality Standards; Design and Implementation of a Quality Management System: Approach to ISO 9001: 2015; Context of the Organization; Leadership and Planning; Support and Operation; Performance evaluation and improvement; Considerations for the Integration of Quality Management: ISO 9001 as the basis for integration; Integration of requirements; Documentary integration; Integration in the Processes; Integration of Audits and Certifications; **Module III: Environmental Management:** Environmental Management in the Company: Global Environmental Problems; Recent Industrial Disasters; Externalities and Environmental Aspects; Circular Economy; The ISO 14001 Standard and the EMAS Regulation: History of the Standard; The ISO 14000 series; The EMAS Regulation; Design and Implementation of an Environmental Management System: Implications of the implementation of an Environmental Management System; Context of the Organization; Leadership, Responsibility and Environmental Policy Environmental Aspects, Objectives and Planning: Support and Operation; Evaluation and Continuous Improvement ; **Module IV: Energy Management:** Energy Management and Efficiency: Regulatory framework; Energy Market; Energy Services ; Energy Management Systems: ISO 50001: Energy Management in the Company; Energy Performance and other concepts of SGEn; Requirements of ISO 50001 Standard; Implementation and Operation; Verification and Review by Management; Energy Audit: Basic concepts of Energy Audit; Energy Audit Requirements; Carrying out the Energy Audit; Consideration for the Integration of Energy Management: Relationship ISO 50001 – UNE-EN 16247; Carbon footprint; Integration in Management; **Module V: Occupational Risk Prevention (ORP/ *PRL*):** Occupational Risks Prevention: Historical Evolution of the ORP (*PRL*); Legal Framework of the ORP (*PRL*); ORP (*PRL*) Management; Historical Evolution of the ORP (*PRL*); Legal Framework of the ORP (*PRL)*; ORP (*PRL*) management; Management of Safety and Health at Work: OHSAS 18001 and ISO 45001: Policy on Safety and Health at Work; Planning; Implementation and Operation; Check; Transition between OHSAS 18001 and ISO 45001, Considerations for the Integration of ORP (*PRL*) Management: Consideration for the

	Integration of the ORP (*PRL*) Management; **Module V I : Other Systems and Tools for Management:** Total Quality Management: Concept of Total Quality; Malcom Baldrige; EFQM model; Ecological Labelling of Products and Services: Ecological Labels; Synthetic Indicators; Social Responsibility: Definition; Global Pact; Sustainability Reports; ISO 26000; SA 8000; SGE21 Standard; Information Security: Protection of Personal Data; Industrial Secret; Information Security Management; **Module VII : Audit and Certification of Management Systems:** Typology of Management Systems Audits: Definition of Audits; Agents involved in the Audit; Types of Audits; Management Systems Audit: ISO 19011: ISO 19011; Management Systems Audit Methodology: The Audit Program; Competence and Evaluation of the Auditors; Conducting the Audit; **Module V III : Case Study:** Direction and Elaboration of an Integrated Management System: During the course the knowledge is applied to a case on which, through the analysis of processes, the necessary documentation in the implementation of an Integrated Management System is designed and prepared by students. At the end, students will have a real integrated model in accordance with the quality, environment, energy management and occupational risk prevention standards studied throughout the course.
Practical training	Practical exercises and tests are carried out to deepen the knowledge acquired in the theoretical part of the course.
Assessment	The evaluation of the student's knowledge is continuous through periodic monitoring of the progress made and their participation in the Tutoring Forums offered by the technological platform that supports the course. In each didactic unit there is a specific evaluation method that allows the teaching team to monitor the student's learning. These evaluation elements are activated on a scheduled basis and must be answered before the established delivery deadline is met.
Training method	Distance training through the ISM Virtual Campus
Training material provided	Online training material; Information; Practical exercises; Verification test
Training facilities	Learning platform that allows the student to access the course content and carry out practices and consultations with the teaching team, as well as having the resources and help they need at any time. The platform is available 24 hours a day and through it the student can request help from the teaching staff at any time. The teaching team will try to reinforce the student's autonomy in their training process, supporting and clarifying all their doubts and difficulties that may arise in the development of the training action. The course is therefore carried out through the different spaces available on the platform, where the student can consult online training material, download information, carry out practical exercises and test the knowledge acquired.
INFORMATION ABOUT THE TRAINERS / TRAINING PROVIDERS	
Trainers Profile	Graduates (Engineers, Environmental Sciences, ...) in the energy field (management systems, environmental services, energy efficiency, renewable energy, ...)
Are the training courses /training providers accredited by a credible authority / certification body?	Yes, Certified by "*Instituto Superior del Medio Ambiente*"
ADDITIONAL INFORMATION	
Contacts	Instituto Superior del Medio Ambiente C/ General Ramírez de Madrid, 8 28020, Madrid, T (+34) 91 444 36 43, info@ismedioambiente.com, www.ismedioambiente.com
Location (in case of class training method)	Online – ISM Virtual Campus

❖ UK

Course Title	ENERGY AND SUSTAINABLE BUILDING DESIGN
Course Provider	DE MONTFORT UNIVERSITY LEICESTER
Course Duration	1 Year
Entry Requirements	You should have the equivalent of a **British Honors degree** (2:2 minimum) in a relevant numerate subject, for example engineering, physical sciences, and mathematics. Architects with an interest in computer modelling are also encouraged to apply.
Accreditations	Accredited by CIBSE and the Energy Institute
Course Overview	The need for sustainable approaches to building design is universally acknowledged. As the effects of climate change are felt, the drive towards more energy-efficient buildings is intensifying. Sustainable buildings need not be technologically complex, but a high level of sophistication in design procedures and performance analysis is required.The course has been accredited by both the Chartered Institute of Building Service Engineers (CIBSE) and the Energy Institute for completing the educational requirements for chartered engineer registration. CIBSE is an international body which represents and provides services to the building services profession, with a membership of 17,000, one-fifth of which is outside the UK. The Energy Institute is the leading professional body for the energy industries, supporting almost 12,000 professionals.
Course Modules	Sustainable Development; Sustainable Buildings; Sustainable Energy; Building; Building Performance Modelling; Energy Analysis Techniques; Study Skills and Research Methods; Dissertation. Each module has 20 credits and dissertation has 60 credits
Relevant Energy Efficiency modules	Sustainable Energy, provides a systematic understanding of the global energy system and energy sources. The module examines the physical principles and application of current technologies and their environmental impacts, and how these interact in energy systems. Energy Analysis, This very practical module will equip you with the skills to analyse energy data from buildings and industrial processes, and to carry out energy audits and surveys to identify energy and greenhouse gas saving opportunities. Issues such as heating, lighting, ventilation and general energy use are considered, and crucially, ways to bring about energy savings and how to make energy saving recommendations, sometimes as much as 20% with zero (or very low) investment. The case studies used are mainly for non-domestic buildings but all of the techniques can also be applied to dwellings. The module includes the theory behind energy analysis, and practical building surveys can be carried out, and data analysis in lab sessions, the assessment being to prepare a report similar to one you would produce as a professional energy efficiency consultant.
Course Qualification	MSc/PG Dip/PG Cert

Course Title	ADVANCED PROFESSIONAL DIPLOMA IN ENERGY EFFICIENT BUILDINGS, SYSTEMS AND REFURBISHMENT
Course Provider	LEEDS BECKETT UNIVERSITY
Course Duration	3 Months
Entry Requirements	Applicants should have either a second-class honors degree in a cognate subject, at least a second class honors degree in a non-cognate subject supported by evidence of an aptitude for the subject applied for, or have or have equivalent experience or training, normally from

	within the work environment.
Accreditations	Leeds Beckett Certification
Course Overview	This course provides an opportunity for the latest practices in the design of energy-efficient buildings and refurbishments. Through case studies and fieldwork, you will analyse the latest energy-efficiency innovations and renewable technologies applied to new buildings and those undergoing retrofits. By examining contemporary passive houses, nearly-zero-energy buildings and energy plus-structures, you will discover how the leading exemplars in this field achieve their efficiency performances. You will also study the shortcomings in current building efficiencies - where they fall short in meeting their energy targets and how they can be improved with the resources available.The work will be shaped by cutting-edge research as individuals collaborate with specialists who help inform new Government regulations and policies. This will broaden their knowledge and help them forge contacts with the principal thinkers and leaders in the building performance sector.
Course Modules	Low to Zero-Energy Buildings and Energy-Efficient Building Systems (20 credits); Sustainable Refurbishment and Retrofit (20 credits)
Relevant Energy Efficiency modules	Low to Zero-Energy Buildings and Energy-Efficient Building Systems – Core. In this module, you will gain a comprehensive understanding of the principals of low to zero energy buildings, focusing on their energy sustainability, fabric and systems such as lighting and heating; Sustainable Refurbishment and Retrofit – Core: In this module, you will discover the techniques relating to sustainable refurbishment and retrofit, examining the design and detail of existing and pre-1900 structures.
Course Qualification	Advanced Professional Diploma

Course Title	**ENERGY SYSTEMS AND DATA ANALYTICS MSc**
Course Provider	**UCL**
Entry Requirements	A minimum of an upper second-class Bachelor's degree or an overseas qualification of an equivalent standard.
Course Duration	MSc (1 year FT, 2 years PT), PG Diploma (9 months)
Accreditations	UCL Certificate, PG certification
Course Overview	The Energy Systems and Data Analytics MSc provides an academically leading and industrially relevant study of energy systems through the lens of data analytics. Advanced analytics, fueled by big data and massive computational power, has the potential to transform how energy systems are designed, operated and maintained. You will gain the skills and knowledge to unlock the transformative potential of big energy data, and understand how it can reshape the energy sector.
Course Modules	Compulsory modules: Energy Systems (15 credits); Energy Data Analytics (15 credits); Statistics for Energy Analysis (15 credits); Energy Analytics in the Built Environment (15 credits); Energy and Transport Analytics (15 credits); Spatial Analysis of Energy Data (15 credits). Optional modules (a choice of two): Introduction to System Dynamics Modelling (15 credits); Eco-innovation, Business and Market Development (15 credits); Energy, Technology and Innovation (15 credits); UK Energy and Environment Policy and Law (15 credits); Econometrics of Energy Markets (15 credits); Dissertation/report; All Master of Science (MSc) students undertake an independent research project which culminates in a 10,000-word dissertation (60 credits).
Relevant Energy Efficiency modules	Energy Analytics in the Built Environment (15 credits); Energy Systems (15 credits); Energy Data Analytics (15 credits); Spatial Analysis of Energy Data (15 credits)
Course Qualification	MSc or PG Diploma and a PG Certificate

Course Title	CARBON MANAGEMENT (ONLINE LEARNING)
Course Provider	THE UNIVERSITY OF EDINBURGH
Entry Requirements	A UK 2:1 honors degree, or its international equivalent, in any subject. We will also take any professional experience into account.
Accreditations	The University of Edinburgh certification
Course Overview	This online MSc is a ground-breaking development of our award-winning campus-based MSc in Carbon Management. It will provide you with high-level knowledge, skills and training in the business, economics and science of carbon management. By the end of the program, students will: demonstrate an understanding of key issues relating to global, regional and local carbon management, specifically: the science of climate change; the economics of climate change; the business response to climate change; be familiar with carbon auditing methodologies, as well as the tools used for climate change impact assessment and adaptation planning; develop and demonstrate an integrated view of mitigation and adaptation by businesses, NGOs and governments; possess in-depth knowledge and understanding in more specific climate change management related areas and obtain an understanding of how to undertake research and apply this knowledge in the context of a major study (dissertation); demonstrate skills in interdisciplinary analysis, drawing upon different empirical sources, analytical perspectives and sub-disciplines within carbon management studies; conduct research into carbon management issues that require familiarity with a range of data, research sources and appropriate methodologies
Course Modules	The MSc comprises seven compulsory courses and a dissertation. You will cover them all in three sections: Climate Change Management (3 courses); Carbon Innovation (3 courses); Applied Carbon Methods (1 course and dissertation).You can study the first two sections as standalone qualifications. If you complete both successfully, you will be eligible for a Postgraduate Diploma in Carbon Management (Online Learning).
Relevant Energy Efficiency modules	Carbon Innovation
Course Qualification	PG Diploma or MSc

Training Course Title:	LEVEL 1: CERTIFICATE IN ENERGY MANAGEMENT ESSENTIALS ONLINE
Training Provider Name:	ENERGY INSTITUTE
COURSE OVERVIEW	
Aim (scope of the training)	An introductory qualification providing a comprehensive, practical overview of the fundamentals of energy management.This 60 hour online course provides participants with all the essential knowledge and skills they need to save energy, reduce operational costs and carbon emissions, comply with legislation and meet their organisation's environmental goals.This course can be started at any time and can be worked through at the participant's own pace. Participants are each assigned an expert tutor who will be available to provide support via telephone or email. You will also be able to interact with others on the course through the course forum on the online learning centre.
Level/Type of training	Level 1/ Online
Target groups	Those looking to begin a career in energy management or have recently taken up a role with energy management responsibilities Those looking to conduct internal energy audits for ESOS (with guidance and sign-off from a qualified ESOS Lead Assessor) Those who would like to refresh their knowledge before pursuing an EI upper-level training course Those coming from a wide range of fields including procurement, facilities management, finance, CSR and sustainability, who want to gain a better understanding of the field of energy management.

Entry requirements	Not Specified
Qualifications /Certification obtained	On successful completion of the course, students will achieve the Energy Institute's Level 1 'Certificate in Energy Management Essentials' training qualification. They will also be well prepared to move on to the Level 2 course to gain the Energy Institute's Level 2 'Energy Management Professional' training qualification.This course also meets the prior-knowledge requirement for attending an International register of Certificated Auditors (IRCA) certified Energy Management Systems (ISO 50001) Auditor/Lead Auditor Training course.
Duration/Structure	60 Hours online course
Course Fee	Energy Institute "EI" Member - 1475.00 £+ VAT Non-Member of "EI" - 1680.00 £ + VAT
EDUCATIONAL Details	
Course Syllabus - Topics	Introduction to energy management: Building an energy management process; Metering and buying; Metering monitoring and targeting techniques; Regulations and standards; Energy auditing in practice; Energy auditing: Report writing; Energy management solutions; Energy management: Project development; Renewables; Mounting an effective staff awareness campaign.
Practical training	Independent project: Energy audit & report.
Assessment	End of course exam
Training method	Not specified or N/A
Training material provided	Not specified or N/A
Training facilities	Energy Institute, 61 New Cavendish Street, London, United Kingdom, W1G 7AR
INFORMATION ABOUT THE TRAINERS / TRAINING PROVIDERS	
Trainers Profile	A registered charity, incorporated by Royal Charter in 2003, the EI is licensed by the Engineering Council (UK) to offer Chartered, Incorporated and Engineering Technician status to engineers, and by the Society for the Environment to award Chartered Environmentalist status.
Certified trainers (Yes / No)	Yes
Are the training courses /training providers accredited by a credible authority / certification body?	EI experts and trainers are chartered and have a wealth of industry experience and expertise
ADDITIONAL INFORMATION	
Contacts	webtraining@energyinst.org
Course frequency	Not Specified

Training Course Title:	**LEVEL 2 ENERGY MANAGEMENT PROFESSIONAL**
Training Provider Name:	**ENERGY INSTITUTE**
COURSE OVERVIEW	
Aim (scope of the training)	Gain a comprehensive understanding of energy management, solve a real-world issue within your organization and achieve the Energy Institute's Level 2: Energy management professional online qualification. The Energy Institute's (EI's) 200 hours online course offers a comprehensive overview of all the knowledge and skills required of a professional Energy Manager. The course covers the essential technical theory of energy use, as well as providing an in-depth understanding of the managerial and commercial aspects of an energy management role. The course is designed to help participants to save energy, reduce carbon emissions, meet their organization's environmental targets and save money. It

	also includes a project that allows a student to solve a real issue within their organization as part of the learning process. Students can work through the materials at their own pace – ideal for busy professionals looking to develop their career while at work.
Level/Type of training	Level 2/ Online
Target groups	Not Specified
Entry requirements	2+ years' relevant experience either working as an Energy Manager or another related area such as Building Services, Energy Engineering, Sustainability, Facilities Management, Procurement or Energy Consultancy OR successful completion of the EI's Level 1 – Certificate in Energy Management Essentials training course. GCSE English and AS / A Level Maths or Science, or equivalent by qualification or experience. Experience in using Microsoft Excel.
Qualifications/Certification obtained	On successful completion of the Level 2 course, you will achieve the Energy Institute Level 2: Energy Management Professional qualification. Those who have 3 or more years' energy management experience will be well-placed to move on to the Level 3: Advanced Energy Manager (AEM) course. **This course has replaced the EI's Level 2: Training in Energy Management through Open Learning (TEMOL) course. EMP and TEMOL are equivalent qualifications.
Duration/Structure	200 hours / Online course
Course Fee	Energy Isntitute "EI" Member - 1880.00 £+ VAT Non-Member of "EI" - 2110.00 £ + VAT
EDUCATIONAL Details	
Course Syllabus - Topics	15 modules totaling approximately 200 hours of online learning; Tutor support with continuous assessment. Flexible part-time, self-paced study that can be started at any time throughout the year; An integral 50-hour work-based project supported by specialist tutors to solve a real energy management problem in your organization. Mandatory core modules: The role of an energy manager; Heat transfer; Fuels and combustion; Finance, procurement and risk assessment; Project implementation; Optional modules: take at least two modules from list A and a further 8 modules from list A or B; List A: Heating and ventilation; Air conditioning and refrigeration; Lighting; Motors and drives. List B: Building physics and thermal comfort; On-site electricity generation; Building management systems (BMS); The UK energy industry and energy costs; UK electricity grids; Measurement and verification; Data testing and analysis; Energy and the environment; Energy management systems and standards: ISO 50001; Compressed air; Steam and process heating; Energy management and transport; Carbon management plans; Energy and water efficiency.
Practical training	Flexible part-time, self-paced study that can be started at any time throughout the year. An integral 50-hour work-based project supported by specialist tutors to solve a real energy management problem in your organisation
Assessment	Tutor support with continuous assessment
Training method	Not specified or N/A
Training material provided	Not specified or N/A
Training facilities	Energy Institute, 61 New Cavendish Street, London, United Kingdom, W1G 7AR
INFORMATION ABOUT THE TRAINERS / TRAINING PROVIDERS	
Trainers Profile	A registered charity, incorporated by Royal Charter in 2003, the EI is licensed by the Engineering Council (UK) to offer Chartered, Incorporated and Engineering Technician status to engineers, and by the Society for the Environment to award Chartered Environmentalist status.
Certified trainers (Yes / No)	Yes
Are the training courses /training providers accredited by	EI experts and trainers are chartered and have a wealth

a credible authority / certification body?	of industry experience and expertise.
ADDITIONAL INFORMATION	
Contacts	webtraining@energyinst.org, +44 (0)20 7467 7178
Course frequency	Not Specified

Training Course Title:	**ISO 500012018 - ENERGY MANAGEMENT SYSTEMS - INTRODUCTION AND AWARENESS 1-DAY TRAINING**
Training Provider Name:	**ENERGY INSTITUTE**
COURSE OVERVIEW	
Aim (scope of the training)	This 1-day foundation course is an introduction for anyone involved in the development, implementation and management of an EnMS based on ISO 50001. It provides an understanding of what an EnMS is, the main requirements of ISO 50001, and how to improve an EnMS once it has been established. This course forms an excellent basis for further training to become an internal or lead ISO 50001 auditor. It comprises lecture and workshop exercises.
Level/Type of training	INTRODUCTION AND AWARENESS
Target groups	This 1-day foundation course is an introduction for anyone involved in the development, implementation and management of an EnMS based on ISO 50001. It provides an understanding of what an EnMS is, the main requirements of ISO 50001, and how to improve an EnMS once it has been established. This course forms an excellent basis for further training to become an internal or lead ISO 50001 auditor. It comprises lecture and workshop exercises.
Entry requirements	There are no formal prerequisites for this course.
Qualifications/Certification obtained	Not Specified
Duration/Structure	1 Day
Course Fee	£450 + VAT
EDUCATIONAL DETAILS	
Course Syllabus - Topics	Learning outcomes: Understand the guidance and application for energy management systems provided by ISO 50001; Explain the purpose of ISO 50001 and the benefits to an organisation of using the standard; Outline key concepts and approaches to an energy management system; Describe, with reference to Plan – Do – Check – Act cycle, the structure, scope and purpose of ISO 50001; Outline key ISO 50001 definitions and terminology; Briefly summarise relevant energy management legislation; Identify sources of law and sources of information on energy management legislation; Outline the key requirements of ISO 50001
Practical training	Not Specified
Assessment	Not Specified
Training method	Not specified or N/A
Training material provided	Not specified or N/A
Training facilities	Energy Institute, 61 New Cavendish Street, London, United Kingdom, W1G 7AR
INFORMATION ABOUT THE TRAINERS / TRAINING PROVIDERS	
Trainers Profile	A registered charity, incorporated by Royal Charter in 2003, the EI is licensed by the Engineering Council (UK) to offer Chartered, Incorporated and Engineering Technician status to engineers, and by the Society for the Environment to award Chartered Environmentalist status.
Certified trainers (Yes / No)	Yes
Are the training courses /training providers accredited by a credible authority / certification body?	EI experts and trainers are chartered and have a wealth of industry experience and expertis

ADDITIONAL INFORMATION	
Contacts	For bookings, a 10% discount code and any queries, please contact the training team at e: webtraining@energyinst.org or t: +44 (0)20 7467 7178.This course is provided in partnership with SGS Academy.
Course frequency	Not Specified

Training Course Title:	**CERTIFIED ENERGY AUDITOR "CEA"**
Training Provider Name:	**SQT**
COURSE OVERVIEW	
Aim (scope of the training)	Based on the growing demand for qualified professionals, the Certified Energy Auditor (CEA™) and Certified Energy Auditor in Training (CEAIT™) certifications were developed and added to the broad portfolio of professional certifications offered by the Association of Energy Engineers. Rising energy costs and inefficiency in plants and buildings is continually driving the need for trained and experienced energy auditors. The CEA certification is one that identifies professionals as having the required knowledge and experience needed to succeed in the growing field of energy auditing. The course program has been developed and adapted for European organisations and covers the key topics of: Energy audit and audit approach; Energy fundamentals; Benchmarking and energy accountancy; Energy auditing instrumentation; Data analysis; Energy financials; Air conditioning systems and refrigeration; Facilities and lighting systems; Electrical systems, motors and drives; Alternative financing and measurement and verification; Hot water and steam boilers and distribution systems; Compressed air; pumping and industrial processes; Commissioning and maintenance; Water conservation and water auditing; Structured energy management programs and ISO 50001; Energy Efficiency Directive and requirements of audits for Article 8 compliance in Ireland and UK.This course is presented in a lecture and discussion format.
Level/Type of training	CEA Certificate / This course is presented in a lecture and discussion format.
Target groups	Staff who have responsibility for energy management and want to gain a better understanding of how to improve their approach to managing energy. Members of energy teams who want to contribute more to the energy and water management challenge. Environmental auditors who want to gain a better understanding of energy and the opportunities for energy reduction.Technicians who want to gain a better understanding of their impact on energy.
Entry requirements	A delegate wishing to achieve CEA certification must have: Four year degree from an accredited university or college in engineering or architecture, or be a registered Professional Engineer (P.E.) or Registered Architect (R.A.). In addition, the applicant must have at least three years of verifiable experience in energy auditing, energy management, facility management, or experience related to energy management OR; Four years non-engineering degree with at least four years of verifiable experience in energy auditing, energy management, facility management, or experience related to energy management OR; Two years technical degree with at least five years of verifiable experience in energy auditing, energy management, facility management, or experience related to energy management; (equivalent of Level 6 on the National Framework of Qualifications e.g. maintenance fitter, maintenance electrician, or certificate in environmental sciences) OR; Ten years of verifiable experience in energy auditing, energy management, facility management, or experience related to energy management; OR; The current status of Certified Energy Manager (CEM®). Note: If you have already attended the CEM course, you will have covered the syllabus for this 3 day CEA programme. It is possible for a person with the correct academic qualification but not having the relevant energy related experience, to undertake the course and the examination. On passing the exam

	they will be awarded the "Energy Auditor in Training" certification. Once the relevant experience has been acquired, the person will receive the CEA certification without having to retake the examination. Persons competencies will be assessed against the BSI published PAS 51215 requirements to ensure that they have the relevant experience to become certified.For applicants whose first language is not English, SQT recommends a minimum English language competency of IELTS 5.5 (or equivalent) for successful completion of this programme. It is important to note that learners are not expected to have an IELTS or equivalent examination complete. Potential delegates are expected to self-assess their English language competency against the IELTS Band scores which can be found in this document.
Qualifications/Certification obtained	The Certified Energy Auditor qualification is awarded by the Association of Energy Engineers (AEE), based in the USA, but with chapters in 81 countries worldwide.Delegates who meet the core requirements, complete the course and pass the examination will be awarded the "Certified Energy Auditor" qualification. Successful delegates will be certified as a Certified Energy Auditor by the Association of Energy Engineers (www.aeecenter.org) and will also receive one year's free membership with AEE. Persons attending this training and passing examination (all in SI Units) and awarded certification as CEA will be automatically approved to act as Lead Assessors in the UK for the purposes of the UK ESOS Legislation.
Duration/Structure	4 days
Course Fee	Not Specified, Should request a quote.
EDUCATIONAL Details	
Course Syllabus - Topics	Participants achieve the following learning outcomes from the programme: Assess the energy consumption of an organization; Analyse the energy data of the organisation to identify key trends or issues; Identify the areas of significant energy use for that organization; Apply the principles of benchmarking the organisation against other similar organisations; Identify the key opportunities for energy and water improvements related to those areas of significant energy use using sound audit principles; Apply sound financial principles to energy management projects including life cycle costing and savings to investment analysis; Engage and interact in a structured energy management environment with a full understanding of the ISO 50001 energy management standard approach; Transition the outcome of their energy audits into a functional energy management system in line with the requirements of ISO 50001; Undertake the role as an ESOS Lead Assessor under UK ESOS Legislation.
Practical training	Not Specified
Assessment	Course learning will be assessed in a comprehensive open book examination.
Training method	This course is presented in a lecture and discussion format.
Training material provided	Not Specified
Training facilities	SQT Training Ltd, Registered Office, SQT Training Ltd, Callan Centre, National Technology Park, Limerick, Ireland. Registration No 342029.
INFORMATION ABOUT THE TRAINERS / TRAINING PROVIDERS	
Trainers Profile	"Ian" was initially a time served electrician who then completed a raft of qualifications including electrical and electronic technician's examinations and graduated from UCC with a degree in Electrical & Electronic Engineering in 1996 before completing a Masters Degree in Sustainable Energy. He is a former Senior Electrical Engineer with the Irish Naval Service and worked as Energy Services Manager for an Irish Energy Management Consultancy. He is a Chartered Engineer and a member of the Institute of Engineers of Ireland, founder president of the Association of Energy Engineers (Irish Chapter) and an approved AEE CEM Trainer Ian has assisted a number of companies to achieve the Irish Energy Management Standard IS393 and provides energy management consultancy to a large number of clients.
Certified trainers (Yes / No)	Yes
Are the training courses /training providers accredited by a credible	Yes, SQT offer the course accredited by AEE

authority / certification body?	
ADDITIONAL INFORMATION	
Contacts	To discuss any aspect of programmes please call us on +353 61 339040 or email info@sqt-training.com
Course frequency	Not Specified

Training Course Title:	**ISO 500012018 - ENERGY MANAGEMENT SYSTEMS - INTERNAL AUDITOR**
Training Provider Name:	**ENERGY INSTITUTE**
COURSE OVERVIEW	
Aim (scope of the training)	This two-day course will guide you through the elements of an energy management internal audit based on ISO 50001.Course dates: 15-16 April 2020 – Bristol, 3-4 June 2020 – Knutsford, 9-10 September 2020 - Stratford-upon-Avon, 11-12 November 2020 - Camberley
Level/Type of training	INTERNAL AUDITOR
Target groups	This course is relevant to you if you are an experienced management system auditor with an understanding of the principles and concepts underlying energy management and/or a professional who seeks an understanding of the skills required to audit against ISO 50001.
Entry requirements	There are no formal prerequisites for this course.
Qualifications/Certification obtained	Not Specified
Duration/Structure	2 Day
Course Fee	£820 + VAT
EDUCATIONAL Details	
Course Syllabus - Topics	Learning outcomes: Describe the purpose of an EnMS; Explain the principles, processes and techniques used for the assessment and management of risk, including the significance of these for EMS auditors Explain the purpose, content and inter-relationship of ISO 50001 and the legislative framework relevant to an EnMS; Undertake the role of an internal auditor to plan, conduct, report and follow-up an audit in accordance with ISO 19011 and by interpreting the requirements of ISO 50001.
Practical training	Not Specified
Assessment	Not Specified
Training method	Not specified or N/A
Training material provided	Not specified or N/A
Training facilities	Energy Institute, 61 New Cavendish Street, London, United Kingdom, W1G 7AR
INFORMATION ABOUT THE TRAINERS / TRAINING PROVIDERS	
Trainers Profile	A registered charity, incorporated by Royal Charter in 2003, the EI is licensed by the Engineering Council (UK) to offer Chartered, Incorporated and Engineering Technician status to engineers, and by the Society for the Environment to award Chartered Environmentalist status.
Certified trainers (Yes / No)	Yes
Are the training courses /training providers accredited by a credible authority / certification body?	EI experts and trainers are chartered and have a wealth of industry experience and expertis
ADDITIONAL INFORMATION	
Contacts	For bookings, a 10% discount code and any queries, please contact the training team at e: webtraining@energyinst.org or t: +44 (0)20 7467 7178.This course is provided in partnership with SGS Academy.
Course frequency	Not Specified

Training Course Title:	ISO 500012018 - ENERGY MANAGEMENT SYSTEMS - AUDITORLEAD AUDITOR 5-DAY TRAINING
Training Provider Name:	**ENERGY INSTITUTE**
COURSE OVERVIEW	
Aim (scope of the training)	This five-day training course offers an opportunity for both environmental and energy management professionals to update their EnMS audit skills. It provides the skills and knowledge to conduct and lead effective energy management system (EnMS) audits in accordance with the requirements of ISO 50001 and ISO 19011.Course dates: 5-9 October 2020 – Denham, 14-18 December 2020 - Stratford-upon-Avon
Level/Type of training	AUDITOR / LEAD AUDITOR
Target groups	This course is relevant to you if you are an experienced management system auditor with an understanding of the principles and concepts underlying energy management and/or a professional who seeks an understanding of the skills required to audit against ISO 50001.
Entry requirements	Participants are expected to have a basic knowledge of energy management systems or ISO 50001 before attending.
Qualifications/Certification obtained	SGS is accredited by the International Register of Certified Auditors (IRCA) globally. This course is accredited by the IRCA, reference number A17574.
Duration/Structure	5 Day
Course Fee	£1,490 + VAT
EDUCATIONAL Details	
Course Syllabus - Topics	Learning outcomes:Explain the purpose of ISO 50001 and the benefits to an organization of using the Standard; Outline key concepts and approaches to an energy management system; Describe, with reference to Plan – Do – Check – Act cycle, the structure, scope and purpose of ISO 50001; Outline key ISO 50001 definitions and terminology; Briefly summarize relevant energy management legislation; Identify sources of law and sources of information on energy management legislation; Describe the principles, processes and techniques used for the assessment of risk and the significance of these in all energy management systems; Outline and interpret the requirements of the ISO 50001 management systems specification in the context of an audit; Effectively plan and conduct an audit of the management and operation of an organization in accordance with the requirements of relevant EnMS audit criteria; Report the audit, including writing valid, factual and value-adding nonconformity reports; Undertake audit follow-up activities, including evaluating the effectiveness of corrective and preventive action
Practical training	Effectively plan and conduct an audit of the management and operation of an organization in accordance with the requirements of relevant EnMS audit criteria; Report the audit, including writing valid, factual and value-adding nonconformity reports; Undertake audit follow-up activities, including evaluating the effectiveness of corrective and preventive action
Assessment	Not Specified
Training method	Not specified or N/A
Training material provided	Not specified or N/A
Training facilities	Energy Institute, 61 New Cavendish Street, London, United Kingdom, W1G 7AR
INFORMATION ABOUT THE TRAINERS / TRAINING PROVIDERS	
Trainers Profile	A registered charity, incorporated by Royal Charter in 2003, the EI is licensed by the Engineering Council (UK) to offer Chartered, Incorporated and Engineering Technician status to engineers, and by the Society for the Environment to award Chartered Environmentalist status.

Certified trainers (Yes / No)	Yes
Are the training courses /training providers accredited by a credible authority / certification body?	EI experts and trainers are chartered and have a wealth of industry experience and expertis.SGS is accredited by the International Register of Certified Auditors (IRCA) globally. This course is accredited by the IRCA, reference number A17574.
ADDITIONAL INFORMATION	
Contacts	For bookings, a 10% discount code and any queries, please contact the training team at e: webtraining@energyinst.org or t: +44 (0)20 7467 7178. This course is provided in partnership with SGS Academy.
Course frequency	Not Specified

Training Course Title:	**LEVEL 3: ADVANCED ENERGY MANAGER**
Training Provider Name:	**ENERGY INSTITUTE**
COURSE OVERVIEW	
Aim (scope of the training)	This 10-day course is an advanced qualification aiming to support experienced energy managers to further advance their careers by gaining the skills and knowledge required to function successfully at a senior level and be able to manage energy across a wide range of business areas, activities and parts of an organization. Following successful completion of the course, delegates will be able to make, communicate and implement effectively strategic decisions and influence an organization's policy through demonstrating their leadership skills.Training dates (2020-2021 intake): Block 1: 28-30 September 2020,Block 2: 2-4 November 2020 Block 3: 30 November-2 December 2020
Level/Type of training	Level 3/ In House
Target groups	Professionals with 4 or more years of energy management experience who are responsible for managing energy within their job function and who are tasked with improving energy efficiency while reducing energy costs Professionals who are currently working in a manager-level role and have successfully completed the Energy Institute's Level 2: Energy Management Professional training course OR the AEE's Certified Energy Manager (CEM) program or equivalent. Those looking to fill in any gaps in their knowledge in preparation for applying for Chartered Energy Manager status
Entry requirements	Professionals with 4 or more years of energy management experience who are responsible for managing energy within their job function and who are tasked with improving energy efficiency while reducing energy costs. Professionals who are currently working in a manager-level role and have successfully completed the Energy Institute's Level 2: Energy Management Professional training course OR the AEE's Certified Energy Manager (CEM) program or equivalent. Those looking to fill in any gaps in their knowledge in preparation for applying for Chartered Energy Manager status
Qualifications/Certification obtained	On successful completion of the course, students are awarded the Energy Institute Level 3: Advanced Energy Manager (AEM) qualification.This course will help fulfil many of the knowledge criteria required for becoming a Chartered energy manager. It will also help demonstrate your CPD on your application and speak with confidence on a range of energy management topics during your interview.
Duration/Structure	140 CPD hours
Course Fee	Energy Isntitute "EI" Member - 3160.00 £+ VAT

	Non-Member of "EI" - 3505.00 £ + VAT
EDUCATIONAL Details	
Course Syllabus - Topics	9 days of energy management training, led by subject experts. Preparatory material and slides from training sessions; Exercise spreadsheets from training sessions designed for use within your organization; Tutor supervision and support for a work-based feasibility study; Exam assessment leading to the Energy Institute Level 3: Advanced Energy Manager (AEM) qualification. *Course modules: Energy fundamentals; Leadership for Energy Managers I *New module: Leadership for Energy Managers II *New module; Energy procurement; Behaviour change *New module; Strategic control systems *New module; Renewables; Alternative supply strategies; Heat recovery *New module
Practical training	Not Specified
Assessment	8 February 2021; A 75% attendance rate is required to pass the course. Please note that this course runs once each year. Given the popularity of this course we recommend booking as early as possible to avoid disappointment.
Training method	Not specified or N/A
Training material provided	Not specified or N/A
Training facilities	Energy Institute, 61 New Cavendish Street, London, United Kingdom, W1G 7AR
INFORMATION ABOUT THE TRAINERS / TRAINING PROVIDERS	
Trainers Profile	A registered charity, incorporated by Royal Charter in 2003, the EI is licensed by the Engineering Council (UK) to offer Chartered, Incorporated and Engineering Technician status to engineers, and by the Society for the Environment to award Chartered Environmentalist status.
Certified trainers (Yes / No)	Yes
Are the training courses /training providers accredited by a credible authority / certification body?	EI experts and trainers are chartered and have a wealth of industry experience and expertis
ADDITIONAL INFORMATION	
Contacts	webtraining@energyinst.org; +44 (0)20 7467 7178
Course frequency	Not Specified

Training Course Title:	**CERTIFIED ENERGY MANAGER "CEM"**
Training Provider Name:	**SQT**
COURSE OVERVIEW	
Aim (scope of the training)	Since its inception in 1981, the Certified Energy Manager (CEM®) credential has become widely accepted and used as a measure of professional accomplishment within the energy management field. Simply put, the designation CEM, which stands for Certified Energy Manager, recognizes individuals who have demonstrated high levels of experience, competence, proficiency and ethical fitness in the energy management profession. Certification as a CEM approves individuals to act as Lead Assessors for the purposes of ESOS in the UK.This course is presented in a lecture and discussion style format and includes the following areas: Need for Energy management; Conducting an energy audit; Energy audit; ;instrumentation; Energy accounting & benchmarking; HVAC systems and improvements; Boilers & Thermal systems; Motors & drive applications and compressed air systems; Maintenance; Commissioning; Economical analysis and life cycle costing; Alternative Energy; Energy Efficient Buildings; Energy Codes & Standards; Energy Purchasing; Energy rate structures; Thermal energy storage; Electrical systems; Energy management systems and effective planning; Industrial systems, co-operation and CHP;Building Automation systems; Lighting Systems and system improvements.
Level/Type of training	CEM Certificate / This course is presented in a lecture and discussion format.

Target groups	Engineering Managers, Energy Managers, Design Engineers, Facility Managers, Energy Team Leaders, Commissioning Personnel, Energy Team members, Energy Consultants and Senior Technicians. Members of Engineers Ireland who attend this course may claim for CPD hours from Engineers Ireland.
Entry requirements	A delegate wishing to achieve CEM certification must have: Four years engineering degree coupled with three years energy related experience or Four years business related degree coupled with five years energy related experience or Two years technical degree (Level 6 on the National Framework Qualification) coupled with eight years energy related experience (Engineering related Certificate qualification or time served electrician/ fitter) or Ten or more year's documented and verifiable energy related experience - backed up with letters from employers.It is possible for a person with the correct academic qualification but not having the relevant energy related experience, to undertake the course and the examination. On passing the exam they will be awarded the "Energy Manager in Training" certification. Once the relevant experience has been acquired, the person will receive the CEM certification without having to retake the examination. Individuals competencies will be assessed in line with the BSI published PAS 51215 to ensure that they have the relevant experience to meet the requirements. For applicants whose first language is not English, SQT recommends a minimum English language competency of IELTS 5.5 (or equivalent) for successful completion of this programme. It is important to note that learners are not expected to have an IELTS or equivalent examination complete. Potential delegates are expected to self-assess their English language competency against the IELTS Band scores which can be found in this document.
Qualifications/Certification obtained	The Certified Energy Manager qualification is awarded by the Association of Energy Engineers, based in the USA, but with chapters in 81 countries worldwide. The Certified Energy Manager course has also been approved by Engineers Ireland as one of its CPD courses. In addition persons awarded CEM Certification undertaking this course and examination (all in SI Units) will be automatically approved as Lead Energy Assessors for the purpose of the UK Energy Savings Opportunity Scheme (ESOS). Delegates who meet the core requirements, complete the course, pass the examination and awarded the "Certified Energy Manager" qualification by the Association of Energy Engineers (www.aeecenter.org) and will also receive one year's free membership with AEE. They will also be automatically qualified to act as Lead Assessors for the purposes of the UK Energy Savings Opportunity Scheme (ESOS) Legislation.
Duration/Structure	6 days
Course Fee	£1510, + €500 for AEE Exam fees & Certification, (includes course documentation, lunch and refreshments)
EDUCATIONAL Details	
Course Syllabus - Topics	Participants achieve the following learning outcomes from the programme: Assess the energy consumption of an organisation and identify the areas of significant energy use. Understand the principles behind energy purchasing and tariff mechanisms and to analyse energy bills within an organisation. Understand the common terminology and units used in energy engineering. Properly understand the issues related to operation and maintenance of key electrical and mechanical plant and properly understand the principles of operation of this equipment. Identify the relevant instruments and tools required to carry out an energy audit within an organization. Plan an energy audit of an organisation to ensure the areas of significant energy use are addressed and ordered to identify end use in advance of supply. Apply the principles of benchmarking the organisation against other similar organisations and utilise key metrics to assess energy performance in area of significant energy use. Identify the key requirements for a monitoring, targeting and reporting system within an organisation. Identify the key opportunities for energy improvements related to the areas of significant energy use within an organisation using sound audit principles. Assess the potential energy savings related to the energy savings identified in terms of energy and monetary values. Apply sound financial principles to energy management projects including life cycle costing and savings to investment analysis to allow

	rational prioritisation of energy projects towards implementation. Apply the appropriate approach towards the verification of savings from energy savings projects including the international performance measurement & verification protocol (IPMVP). Identify the key issues related to energy in a range of related activities such as building management and control systems, commissioning and maintenance and how to ensure that energy management becomes integrated into the activities Engage and interact in a structured energy management environment with a full understanding of the ISO 50001 energy management standard approach.Undertake the role as an ESOS Lead Assessor under UK ESOS Legislation
Practical training	Not Specified
Assessment	Course learning will be assessed in a comprehensive open book examination
Training method	This course is presented in a lecture and discussion format.
Training material provided	Not Specified
Training facilities	SQT Training Ltd, Registered Office, SQT Training Ltd, Callan Centre, National Technology Park, Limerick, Ireland. Registration No 342029.
INFORMATION ABOUT THE TRAINERS / TRAINING PROVIDERS	
Trainers Profile	"Ian" was initially a time served electrician who then completed a raft of qualifications including electrical and electronic technician's examinations and graduated from UCC with a degree in Electrical & Electronic Engineering in 1996 before completing a Masters Degree in Sustainable Energy. He is a former Senior Electrical Engineer with the Irish Naval Service and worked as Energy Services Manager for an Irish Energy Management Consultancy. He is a Chartered Engineer and a member of the Institute of Engineers of Ireland, founder president of the Association of Energy Engineers (Irish Chapter) and an approved AEE CEM Trainer Ian has assisted a number of companies to achieve the Irish Energy Management Standard IS393 and provides energy management consultancy to a large number of clients.
Certified trainers (Yes / No)	Yes
Are the training courses /training providers accredited by a credible authority / certification body?	Yes, SQT offer the course accredited by AEE
ADDITIONAL INFORMATION	
Contacts	To discuss any aspect of programmes please call us on +353 61 339040 or email info@sqt-training.com
Course frequency	Not Specified