

NATIONAL REPORT - SPAIN

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1. INTRODUCTION

The present report has been prepared by INCOMA. Hereby we have intended to outline the current situation of the Energy auditor or Energy manager profession in Spain and, particularly, Andalusia. ENACT Spanish partners are based in this region which has some Institutional, legislative and training specifications that will be explained below.

Professional profiles are divided in Spain into five levels. The Spanish National Institute for Qualifications (INCUAL) is in charge of defining and the profiles from level 1 to 3 (where a pre-requisite of holding a University degree is not requested). Levels 4 and 5 are usually defined and recognized by Professional Associations and Universities through post-graduate studies.

The energy manager's profile is not clearly stated in all levels but, according to the opinion of several experts from INCUAL, the Andalusian Institute of Professional Qualifications (IACP) and the Professional Association of Energy Managers in Andalusia (APADGE) different qualifications from level 3 to 5 could apply depending of the range of activities and responsibilities the technician would have.

One should stress the existence of different technicians working in the field of energy efficiency, namely:

- Auditor, a professional that identifies and describe the situation of the installation analysed; this professional does not design or implement solutions that achieve these goals;
- Consultant or adviser, who designs and implements solutions to achieve a reduction on energy expense and carbon footprints, as well as works to raise the clients' awareness to energy consumption and costs;
- Manager, a professional whose profile combines the identification of opportunities to reduce energy expense, the design and implementation of solutions to achieve such a reduction and a didactic approach towards clients. This professional includes the diagnosis, project, and development-, VET of the project to improve the energetic efficiency.

Even though other opinions might differ, we consider that an energy manager is better equipped to succeed in his/her job, as he/she possesses the knowledge and skills to analyse energy efficiency in a transversal way, from identification to preparation and implementation of projects.

2. INSTITUTIONAL

2.1. NATIONAL POLICIES

The European Union has defined energy as a strategic sector, as it is affected by climate constraints and geopolitical factors (energy dependence) and its increasing costs impact on the competitiveness of the Union as a whole.

Energy was, therefore, set as one of the areas addressed by the **Europe 2020 Strategy** for sustainable growth, which intends to adapt the economies of the EU Member-states and to foster the competitiveness of these countries.

The European Union has namely defined as goals:

- Limiting the greenhouse gas emissions by 20%;
- Rising the usage of renewable energies to 20% of the total needs;
- Increasing energy efficiency by 20% (compared to 1990 levels).

Even though the EU has set a common policy and common goals (Europe 2020), these objectives can only be achieved through national intervention and implementation.

Spain has set up a **National Plan for Energy Efficiency** for the period comprised between 2011 and 2020¹ that continues and deepens the achievements of previous National Plans and establishes some key measures:

- 1) Increasing railway as a means of transport;
- 2) Fostering the energetic rehabilitation of existing buildings;
- 3) Improving energy efficiency of existing buildings;
- 4) Setting up plans for transporting employees;
- 5) Setting up plans of sustainable mobility in urban areas;
- 6) Improving energy efficiency of lightening infrastructures in existing buildings;
- 7) Improving technology equipment and processes;
- 8) Updating existing streetlight infrastructures;
- 9) Fostering cogeneration stations in non-industrial activities;
- 10) Energy auditing and action plans in farms.

¹ http://www.idae.es/uploads/documentos/documentos_11905_PAEE_2011_2020_A2011_A_a1e6383b.pdf

Some important aspects were taken into consideration while preparing this National and setting new goals:

- Spain has improved its energy consumption, but it is still 15% above the EU15 average;
- Spain has the same per capita electricity consumption as the UK (but a lower income and more hours of light) and a higher per capita energy consumption than Italy (a country with similar weather and economic conditions);
- Spanish citizens consider that there is plenty of energy waste (85%) and that they have the capability of improving the energy savings (86%).

The Spanish National Plan for Energy Efficiency will have a cost of almost 46 million euros. However, savings are estimated to rise up to almost 79 million euros, placing the net benefits of these measures in less than 38 million euros.

The international norm **ISO 50001:2011**² is applicable in Spain to all organisations intending to certify energy management systems in regards to energy performance. It specifies the requirements for establishing, implementing, maintaining and improving an energy management system and aims to help organisations continually reduce their energy use, and therefore their energy costs and their greenhouse gas emissions.

Released in 2011, this norm is applicable to any organisation, regardless of its size and geographic location and sets a framework of requirements based on the approach “plan – do – check – act”.

The importance of energy efficiency stresses the need and the increasing demand for trained and accredited professionals to certify energy management systems. Whereas some organisations already contemplated the figure of a professional that was responsible for quality and environmental questions, the figure of a new professional, the energy manager, is making its way into the national panorama and organisations.

These professionals’ career prospects include:

- Green jobs;
- Sustainable building/construction;
- Building energy certification assistant;
- Solar installation sales;
- Assembling and maintaining solar thermal installations;
- Promotion of energy efficiency programs.

² <https://www.iso.org/obp/ui/#iso:std:iso:50001:ed-1:v1:en>

In Spain, one can find a multitude of companies providing services in the area of energy (ESE - *Empresa de servicios energeticos*).

According to the Directive **2006/32/EC**³, energy services companies are “a natural or legal person that delivers energy services and/or other energy efficiency improvement measures in a user's facility or premises, and accepts some degree of financial risk in so doing. The payment for the services delivered is based (either wholly or in part) on the achievement of energy efficiency improvements and on the meeting of the other agreed performance criteria”.

These companies focus on energy savings, which translates in reducing costs with energy and reducing CO2 emissions. This is achieved through designing and implementing projects that ensure an efficient management of energy.

2.2. LEGISLATIVE FRAMEWORK AND NATIONAL QUALIFICATION FRAMEWORK

In Spain there are several organisations trying to regulate, foster or frame the figure of the energy manager. Among them we can highlight the main public institutions such as I.D.A.E. (Institute for the Diversification and Energy Savings) and all energy agencies managed at a regional level, such as EVE, INCASOL, Andalusian Energy Agency, AGENEX, ENERAGEN, as well as all local agencies.

On the other hand training institutions are dynamising both the existing and new training solutions, resorting to online training, classroom-based training, addressing professional training graduates or tertiary education graduates.

Finally, there are also professional associations, such as A3e, ANESE, APADGE or APROBASGE, that are homogeneously defining a specific framework for the formal and professional recognition of profiles.

The contents approached by these agents vary according to those who are developing the training or action plan.

It is important to highlight that there is not a clear direction in the subject and each body is trying to follow what considers to be the best or most appropriate, without much consideration of the real market needs or the common interests of different stakeholders. The existing framework is based on the following legislative acts.

³ <http://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32006L0032&rid=1>

Royal Decree 235/2013 (*Real Decreto 235/2013*), published on the 5th April 2013, establishes the procedures for certifying the energy efficiency of buildings in Spain, thus implementing in the Spanish legal system the Directive 2010/31/EU.

Furthermore, this legislative act also foresees the figure of the Qualified Technician for Energy Certification of Buildings as the person who possesses the education and training allowing him/her to:

- Prepare projects or manage building works, and to implement building works or prepare thermal installation projects;
- Issue energy efficiency certificates (article 1, paragraph 3p).

Moreover, it defines the figure of the Technical Assistant for Energy Certification of Buildings as the professional who possesses a training course that allows him/her to assist the manager and/or auditor in certifying the energy efficiency of buildings (article 1, paragraph 3q).

According to Royal Decree nº 235/2013, the following occupations are able to issue energy performance certificates:

- Architects, technical architects and quantity surveyors;
- Engineers (aeronautical, agricultural, civil, industrial, mining, forest, naval, telecommunications);
- Technical Engineers (aeronautical, agricultural, forest, industrial, mining, naval, public works, telecommunications, land surveyor);
- Chemical engineers and industrial engineers specialised in chemistry.

On the other hand, Royal Decree 56/2016 (*Real Decreto 56/2016*), published on 13th February 2016, partially transposes into the Spanish legal system the Directive 2012/27/EU, in what concerns energy audits and procedures for certifying energy services and audit providers.

After a considerable delay in its approval and publication, this legislative act defines the requirements for energy audits in companies and the profile required by professionals carrying out energy audits in companies, which are mandatory for companies with more than 250 employees or a business volume higher than 50 million euros.

According to this Royal Decree, training of Energy auditors should comply with at least one of 2 requirements:

- 1) be in possession of a Higher Education degree that addressed energy related questions or
- 2) have the theoretical and practical knowledge about energy (through a VET degree or an official instrument of accreditation related to a professional qualification foreseen in the National Catalogue of Professional Qualifications; or by certified professional competences obtained through professional experience as laid down by the Royal Decree 1224/2009) and successfully complete a training course as foreseen in Royal Decree nº 56/2016.

Royal Decree 1177/2008 (*Real Decreto 1177/2008*), published on the 11th July 2008, establishes the Higher VET Technical Diploma (*Ciclo Formativo de Grado Superior*) on Energy Efficiency and Solar Thermal Energy (*Técnico Superior en Eficiencia Energética y Energía Solar Térmica*).

People completing this Vocational Training Diploma are expected to acquire qualification to evaluate the efficiency of energy and water installations, technically supporting the energy evaluation and certification, and to configure solar thermal installation, managing its assembling and maintenance.

One should also point out the professional qualification framework indicated by the Spanish National Institute for Qualifications (*INCUAL - Instituto Nacional de las Cualificaciones*): energy efficiency in the building sector (*Auditor Energético en Edificación*). This professional qualification includes the following unit of competences: managing the efficient use of energy, evaluating the efficiency of energy and water installations, assisting in the process of energy certification, assessing the viability of implementing solar installations, promoting the efficient use of energy and presenting improvement proposals.

Whereas the training framework is established by INCUAL, private institutions are actually the ones implementing different courses and making them available to the public.

There are several national institutions accredited by ENAC (*Entidad Nacional de Acreditación*), the Spanish entity responsible for assessing technical competence in accordance with international standards, to provide professional training courses (private non formal training).

Even though such institutions have been certified to provide training, official nation-wide certification does not exist – professionals can attend courses taught by institutions that are certified to provide such training, but there is not one single national certification issued by the State that one can request and that accredits energy managers.

Concluding, INCUAL establishes a national professional qualification framework for training related to energy efficiency. However, one can only find private companies teaching courses in this area and there is no national certificate to accredit professionals, except for professional qualifications from the National Catalogue of Professional Qualification which can be recognised by a professional certificate.

Indeed, we must stress the existence of a professional certificate (*Certificado de profesionalidad*)⁴, which is an official instrument of accreditation of a professional qualification from the National Catalogue of Professional Qualifications. These certificates accredit a set of professional competences that qualify a professional to exercise a professional activity identified in the National Catalogue of Professional Qualifications. Furthermore, they can also be awarded to experienced professionals, thus accrediting their professional experience.

⁴ https://www.sepe.es/contenidos/personas/formacion/certificados_de_profesionalidad/certificados_profesionalidad.html

Therefore, these certificates can be seen as similar to the European Credit system for Vocational Education and Training (ECVET) in defining a common methodological framework that facilitates the accumulation and transfer of credits for learning outcomes from one qualifications system to another.

Furthermore, the Spanish National Classification of Occupations (*Clasificación Nacional de Ocupaciones*) from 2011⁵ recognises the profession of technician of installations of energy production (Técnicos en instalaciones de producción de energía). These professionals that those that operate, monitor and supervise the switch panels and electric equipment in centres that control the production and distribution of electric energy or energy of other types in transmission networks. It can include professionals working in power plants, hydroelectric plants, nuclear plants, solar plants and energy systems. Nevertheless, the Spanish National Classification of Occupations does not foresee the existence of an energy manager or energy auditor.

At a regional level, Andalusia has published the Law 1/2014 (*Decreto-ley 1/2014*)⁶ that regulates a regional programme for promoting sustainable building/construction and that defines the figure of the energy manager as a trained professional that:

- Prepares the report of the building evaluation;
- Studies and prepares energy efficiency actions and measures;
- Participates in managing construction works;
- Signs the certificate issued by the end of construction works;
- Prepares the energy management plan of the buildings.

However, Decree-Law 1/2014 mentions only that professionals acting as an Energy Manager should be in possession of a University degree or a Higher VET Technical Education Diploma that provides the technical competences in the field of energy efficiency.

Once again, even though the figure and competences of energy managers are legally defined and institutions providing training are accredited to do so, there is not a national certification that assures the quality and professional recognition of such training, which results in an unregulated sector.

⁵ <http://www.ine.es/jaxi/menu.do?type=pcaxis&path=/t40/cno11&file=inebase>

⁶ <http://www.juntadeandalucia.es/boja/2014/58/1>

3. TRAINING OF ENERGY AUDITOR

3.1 STRUCTURE AND METHODOLOGY

Currently there is no clear regulation in the area of training for energy managers, neither a single educational framework. The figure of the energy manager (or auditor) itself has many aspects.

Initially, training was developed by companies that monitor international norms. Afterwards, sectorial associations have developed their own standards, and universities and professional training centres have also developed them.

On the other hand, one must take into consideration the wide range of existing online training courses.

Some companies, centres or institutions that provide training courses related to energy efficiency and energy management include: CIRCE, AE3, ANESE, EEV, Inega, Ihobe, Exitae, UNED, Bureau Veritas, AENOR, CAFARAGON, University of Seville, and University of Alcala, among many others.

There are currently several Master degrees and post-graduate degrees that encompass renewable energies and energy efficiency. There are also courses that address topics like installations and energy efficiency, and maintenance and energy efficiency.

On the other hand there are also VET centres that have developed and provide Superior-level Cycle degrees. Graduates are awarded the title of Higher Technician (*Técnico Superior*).

This scenario is developed in quite an uncoordinated way and without defining a clear professional profile. The uniqueness of the Spanish State in this type of competences results in a “competition” between the Autonomous Communities, public and private institutions in terms of providing training to future professionals, without much consideration to the end result, which would be the reduction of energy demand by consumers.

Therefore, when analysing the existing offer for energy manager (or auditor) training, it is possible to observe Level 3 qualifications (as defined by INCUAL and that refer to Vocational Training degrees), which is considered to be adequate and appropriate for the professional requirement of an energy manager (or auditor), as detailed below. But there are also qualifications of a higher level (Levels 4 and 5), which are managed by Professional Associations and Universities.

Even though this sector is unregulated, we would like to present several training opportunities divided by training level: Higher Education, Vocational Training and non-formal training.

Higher Education:

As said before, there is no any official training for this kind of professionals; however, there are some Degrees close to the profile of the energy managers/auditors:

- Degree in Energy Engineering by the University of Seville and University of Málaga (*Grado en Ingeniería de la Energía por la Un. de Sevilla y la Un. de Málaga*) – graduates will have acquired competences to develop a profession in the following sectors: energy resources; thermal energy generation technologies; renewable energy sources; energy distribution; energy transformation; energy efficiency; energy markets; environmental, economical, legal and safety aspects related to energy.

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- Career opportunities
 - Petrochemistry;
 - Energy suppliers;
 - Transport, industry, building/construction;
 - Renewable energies;
 - Engineering and consulting;
 - Public Administration;
 - Private and public R&D centres.

Other Engineering Degrees are close to the professional profile of the energy auditor, and a significant percentage of the students holding these degrees choose energy efficiency as specialisation. One example is the Degree in Civil Engineering with specialisation in Renewable Energy.

- Official Post degrees:

- Master in Integrated Management of Building;
- Master in Environmental Engineering;
- Master in Electric energy systems;
- Master in Thermal energy systems;
- Master in Energy and transport intelligent systems.

- Other Post degrees:

- Specialisation in Energy management in the building sector (UNED, Spanish National Distance Education University);
- Master in Renewable Energies and Electric Systems (UNED, Spanish National Distance Education University);
- Online Executive Master in Renewable Energies (*Escuela de Organización Industrial*, School for Industrial Organisation).

People completing these University degrees do not automatically acquire skills or knowledge to work as energy managers and additional non formal training might be necessary. However, since the profession of energy manager is

unregulated and does not exist a national official certification to accredit these professionals, one can find graduates from several areas of studies working as energy managers.

Vocational Training and Education:

Within the framework of Vocational Training, we can find the abovementioned “Superior-level Cycle on Energy Efficiency and Solar Thermal Energy” (*Técnico Superior en Eficiencia Energética y Energía Solar Térmica*), an official training course with a duration of 2000 hours (Royal Decree, *Real Decreto*, 1177/2008).

- Requirements:⁷

Direct access:

- Being in possession of Bacallaureate diploma;
- Having passed the second course of any modality of experimental Bacallaureate;
- Being in possession of any Superior-level Cycle or equivalent;
- Having passed the University Orientation Course (COU);
- Being in possession of any University Degree or equivalent.

For those who cannot reach any of the requirements listed above, there is an alternative admission test, which can be undertaken by people who:

- Are 19 years old the year of the test; or
- 18 for those who already have a middle-cycle of Vocational Training education.

- Training Plan:

Training modules:

- Thermal equipment and installations;
- Installation processes;
- Graphical representation of installations;
- Energetic efficiency of installations;
- Facilities' energy efficiency;

⁷ <http://www.todofp.es/todofp/que-como-y-donde-estudiar/que-estudiar/familias/energia-agua/eficiencia-energica-energia-solar.html>

- Buildings' energetic certification;
- Efficient water management in edification;
- Thermal solar facilities configuration;
- Assembly and maintenance management of thermal solar facilities;
- Efficient use of water and energy promotion;
- Energy efficiency and solar thermal energy projects;
- Career guidance;
- Entrepreneurship;
- Internship in workplaces.

This curriculum is further developed at a regional level, where each Autonomous Community establishes the norms applicable to institutions providing training that awards the title Superior-level Cycle on Energy Efficiency and Solar Thermal Energy (*Técnico Superior en Eficiencia Energética y Energía Solar Térmica*).

In Andalusia this further development is established in the Order published on the 7th July 2009⁸.

This Order mentions that the main goals to be achieved by students completing the course are as follows:

- Being able to characterise thermal and light installations and analyse the basis parameters of its functioning, in order to evaluate energy efficiency;
- Analyse equipment, components and energy saving systems;
- Identify and characterise equipment and components of lighting systems;
- Analyse the different types of enclosures;
- Analyse the different types of installations for hot water, plumbing, heating, cooling and lighting, assessing the potential for energy saving;
- Analyse the thermal behaviour of buildings and installations;
- Analyse the administrative procedures to obtain an energy efficiency certificate according to the Spanish Law;
- Characterise water installations in buildings, analysing its basic functioning;
- Analyse reports for the improvement of water installations, justifying the proposals for reducing water consumption;
- Analyse regulatory requirements on energy supply and implementation of solar installations;
- Identify and characterise equipment and components of solar thermal installations;

⁸ <http://www.todofp.es/dctm/todofp/fichas-titulos/curriculos-ccaa/ena/eficienciaenergetica/andtseficiencia-energetica-energia-solar-termica.pdf?documentId=0901e72b81c20f6d>

- Analyse projects of solar thermal installations, identifying relevant information for reports;
- Define procedures for the assembly and start of solar thermal installations;
- Define procedure for the maintenance of solar thermal installations;
- Analyse sales guides, justifying the advantages and benefits of products and services to save energy and water;
- Analyse the regulations, energy plans and European, national and regional policies, selecting the most relevant information on energy and water efficiency to explain to consumers;
- Identify techniques and evaluation procedures related to informing consumers and promote energy and water efficiency;
- Analyse measures for the prevention of occupational risks, measure for safety and for environmental protection, identifying the legislation applicable on solar thermal installations;
- Describe the roles within a work group and identify responsibilities, in order to establish appropriate professional relations;
- Identify how to intervene in order to solve professional and personal conflicts, in order to ensure an appropriate working environment;
- Identify and assess opportunities of professional improvement and training;
- Identify changes (technological, organisational, economic and labour) in the profession, assessing the implication of such changes, in order to maintain an innovative approach;
- Recognise business opportunities, identifying market needs;
- Recognise the rights and obligations of an active agent in today's society.

All courses must include and address the following professional modules:

- Installation processes;
- Graphical representation of installations;
- Energetic efficiency of installations;
- Buildings' energetic certification;
- Efficient water management in edification;
- Thermal solar facilities configuration;
- Efficient energy and water promotion;
- Thermal equipment and installations;
- Energy efficiency and solar thermal energy projects;
- Entrepreneurship;

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- Workplace training.

- Career Opportunities

Both in private and public sectors, private companies working in this area or through self-employment, assuming the following occupations:

- Solar installation sales;
- Assembling and maintaining solar thermal installations;
- Energy manager;
- Assistant in energy certification processes;
- Promotion of energy efficiency programs.

- Access to University

- After completing the Superior-level Cycle on Energy Efficiency and Solar Thermal Energy, students have access to Higher Education studies;
- Preferential access to Higher Education courses is given to those who have studied Science, Engineering and Architecture.

- Training Centres in Andalusia:

- IES Reyes de España, Linares (Jaén);
- C.C. Virgen de los Reyes (Sevilla);
- IES Marqués de Comares, Lucena (Córdoba);
- IES Virgen del Carmen, Puerto Real (Cádiz);
- IES Politécnico, Sevilla;
- Cesur (Sevilla and Málaga. Face to face and also distance learning).

Private non formal training:

It is also to be highlighted the existence of private training courses (non-formal training) that focus on acquiring skills related to energy efficiency. Private institutions are actually the ones implementing these courses and making them available to the public.

Some examples follow:

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- Energy auditor in in the building sector (*Auditor Energético en Edificación*)

A course provided by A3E, the Association of Energy Efficiency Companies and certified by ENAC (the Spanish entity responsible for assessing technical competence in accordance with international standards)

This training course is intended to prepare its students to perform and supervise energy audits in buildings and must fulfil requisites such as a minimum of 200 hours. More specifically, this course will:

- prepare the energy auditor to conduct audits and energy certifications of buildings
- revise the legislation applicable to energy installations in buildings
- provide knowledge on the available energy solutions
- introduce students to computer programs for energy certification
- provide knowledge on how to operate and handle measurement and monitoring devices
- apply the procedures for measuring and assessing savings
- provide an introduction to companies providing services in the area of energy

Training contents include the following modules:

- Basic concepts on energy and heat transmission
- Energy structure of the building
- Energy in the building sector and equipment
- Technological development in the sector of renewable energy
- Process of measurement and verification of measurement
- Regulations on energy efficiency and air quality
- Framework programmes for the energy rating of buildings
- Energy audit as an element for the analysis and diagnostic
- Energy savings and energy efficiency measures
- Companies providing services in the area of energy and its financing

This course is expected to prepare attendees to obtain the certificate by AEC (the Spanish Association for Quality). Certification regarding energy auditors in the building sector is awarded to university graduates in the areas of Engineering, Architecture, Environmental Science, Physics and Chemistry that attended a training course on energy efficiency and successfully completed a knowledge test.

- Chief energy auditor in the building sector (*Auditor Energético Jefe en Edificación*)

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AEC (the Spanish Association for Quality) also awards certification for chief energy auditor in the building sector.

Certification is awarded to university graduates in the areas of Engineering, Architecture, Environmental Science, Physics and Chemistry that have a minimum work experience of 3 years and have conducted at least 20 energy audits.

- Energy Manager (*Gestor Energético*)

APADGE (Andalusian Professional Association of Energy Managers) provides a 90-hour course on energy management that intends to provide participants with a general overview of processes, measures and implementation of projects of energy efficiency.

The figure of the energy manager is defined as the professional that intervenes in several areas related to energy, such as:

- Energy supply – contracting supervision, managing offers, periodic follow-up, solving issues, predict consumptions and provide an adequate budget
- Quality supply – solving issues, preventive actions, ensuring the quality of supply
- Monitoring legislation – follow-up and adaptation to new norms, proposing adaptation and improvement measures
- Action Plan – design and development of a plan, defining a timing for actions, evaluating results and managing aids

The course structure is as follows:

- Introduction and general concepts
- Energy management procedures and processes
- Energy management as a tool for business

3.2 THE GEOGRAPHICAL COVERAGE (NATIONAL AND OR REGIONAL)

INCUAL is the institution establishing a national professional qualification framework for training related to energy efficiency.

However, even though there is a national framework that intends to even training courses nationally, one can only find private companies teaching courses in this area and there is no national certificate to accredit professionals.

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Since the energy efficiency training is an unregulated sector that is currently expanding due to the increasing demand of professionals, training is available unevenly throughout the country, depending on demand and the interest of such institutions in providing this training.

3.3 TYPE OF TRAINING

As fully detailed on “2.2.Legislative framework and national qualification framework”, training related to energy efficiency in Spain must be considered volunteer, as it depends on the trainees and no specific professional training is required.

At a University and Vocational Training level, training is mostly at classrooms and evaluation differs from institution to institutions. However, one can state that it is predominantly based on exams. Certification is provided through the degree diploma.

At a non-formal training level, training methods vary and can be onsite (classroom), online (e-learning) and blended (b-learning). Certification can be provided through a document issued by each institution that makes proof that the trainee has attended the course. Still, as mentioned, this is valid only as a proof made by the institution and does not entail any sort of national official certification, as such a certification does not exist.

3.4 ENTITIES RESPONSIBLE FOR ACCREDITATION

ENAC, *Entidad Nacional de Acreditación*, is the Spanish entity responsible for assessing technical competence in accordance with international standards.

It is a non-profit body that accredits institutions providing conformity assessment services, regardless of the sector in which they operate, such as:

- Laboratories;
- Inspection Bodies;
- Certifying Bodies;
- Environment Verifiers;
- Greenhouse Gas Emission Trading Verifiers;
- Intercomparison Program Providers;
- Control Bodies.

It is important to stress that ENAC only accredits institutions and not the institutions’ employees or trainees.

On ENAC's website, it is possible to view institutions that have been accredited per area of activity. Under "energy management systems", one can find AENOR (*Asociación Española de Normalización y Certificación*), the Spanish Association for Standardisation and Certification.

AENOR is a private non-profit organisation that accredits and certifies companies and products according to international norms, such as ISO norms, in several areas of activity. Even though the certification provided by company is quite valued and recognised, one should argue that it is a private institution.

Thus, as thoroughly explained, in Spain there is a lack of national official certification provided by the State.

4. BEST PRACTICES

1. EEV (*Escuela de Energía Verde*) is a non-formal training institution that focuses on renewable energies and energy efficiency. It provides an online platform where the information is constantly updated and available to those interested in clean and sustainable energies.

The institution intends to foster the interest on renewable energies and energy saving and efficiency, supported by quality training that is easily accessed and monitored by qualified professionals.

EEV is present in Spain and the Dominican Republic and provides online (e-learning and mobile learning) training solutions.

2. ENFORCE⁹ is a project funded by the European Union and aimed at contributing to overcome the not technological barriers obstructing the development of citizens' investments in the energy upgrading of the existing residential buildings.

Its main tool consisted in the creation of an Energy Auditors Network, composed by independent and professionally qualified experts, which consumers might address to for carrying out the Diagnosis and the Energy Certification of their houses.

3. APADGE¹⁰ (*Asociación Profesional Andaluza de Gestores Energéticos*) is the Andalusian Professional Association of Energy Managers and provides a set of services to its associates, including: training courses on energy efficiency (financed, online and introductory); monitoring and updating information on relevant aspects, such as the legal framework or tenders; consulting services related to energy efficiency, financing and technical assistance; events; workgroups to foster the exchange of experiences among professionals; and

⁹ <http://www.enforce-eeen.eu/eng/>

¹⁰ <http://www.apadge.com/>

a section devoted to employment opportunities. The Association also provides specialised legal support or marketing solutions for the energy efficiency sector.

It is the first and only Association operating on and targeting the energy sector in Spain, providing support and accrediting the associated energy managers, at the same time working towards the recognition and quality of the professionals devoted to energy efficiency.

4. **STEEP**¹¹ is a project co-funded by the European Union and coordinated by EUROCHAMBRES that intends to help about 600 small and medium sized enterprises (SMEs) in 10 different EU countries to save 10-15% of their energy costs in 3 years, through tailored training and guidance on effective energy management tools.

Additionally, pilot projects will be implemented in seven different countries across Europe, involving additional SMEs and setting up Local Energy Communities, shifting energy management from an individual approach to a collective one.

Even though the project is still being executed, STEEP is expected to contribute to the EU's goal of increasing energy efficiency by 2020, while at the same time providing European SMEs with an opportunity to make substantial savings and increase their competitiveness.

Spain participated in the project through the Chambers of Commerce (*Cámaras de Comercio de España*) - <http://www.camara.es/es/relaciones-institucionales/estudios-especificos/steep>

5. **CHANGE**¹² is a project funded by the European Union and coordinated by EUROCHAMBRES that was developed during 2008 and 2010 and aimed at helping small and medium sized enterprises (SMEs) to optimise their energy use by developing a European network of Intelligent Energy advisors at Chambers of Commerce and Industry and by kick-starting/enhancing concrete assistance to SMEs.

The project involved 61 Chamber of Commerce and Industry (CCIs) from 12 European countries. CCI advisors were provided with training on energy efficiency and application of renewable energies, acting as a “first port of call” for SMEs in energy matters.

Spain participated in the project through the High Council of Official Chambers of Commerce, Industry and Navigation (*Consejo Superior de Cámaras Oficiales de Comercio, Industria y Navegación de España*) - <http://www.camara.es/>

¹¹ <http://www.steep.eu/>

¹² <http://ec.europa.eu/energy/intelligent/projects/en/projects/change>

6. The **Chamber of Commerce and Industry of Seville (*Cámara de Comercio e Industria de Sevilla*)** has set up a regional development plan¹³ that fosters energy audits in SMEs and City Councils, under which it intends to achieve 20% to 30% energy savings, in compliance with the Europe 2020 Strategy and the Directive 2012/27/EU on energy efficiency.

The institution has a broad experience in collaborating with companies operating in the energy sector and has worked with the Andalusian Energy Agency¹⁴, government-owned entity assigned to the Regional Ministry of Economy, Innovation and Science, whose mission is to develop the policies of the Andalusian Regional Government aimed at optimising the energy supply of our region, from an economical and environmental point of view.

Under this plan, the Chamber of Commerce is responsible at a regional level for coordinating local energy policies, implementing the local energy optimisation plan, controlling audits prior to tenders related to energy services, controlling and managing tenders and the optimisation plan, and implementing local energy initiatives.

7. **AIRE¹⁵** is a Transfer of Innovation project funded that intends to export the German Vocational Training course on “Assistant for Regenerative Energy techniques and energy management” to other European countries, namely Belgium, Denmark, Spain and Turkey. Partner countries have developed curricula or common modules that allow comparable and defined common quality standards.

The project is based on the fact that the EU countries will need well-trained technical staff to achieve Europe 2020 Strategy commitments and goals on energy reduction and efficiency, and intended to establish a common European AIRE standard which could be applied all over Europe. This standard should be easily transferable and recognized everywhere due to transparent assessment methods.

Spain was represented in the project through CENIFER (*Centro Nacional de Formación Profesional Ocupacional en Energías Renovables*), a professional training centre targeting professionals operating in the Renewable Energies and Energy Efficiency sectors.

8. **EnerAgen¹⁶** is the Spanish Association of Spanish Agencies of Energy Management. It intends to be a structure that groups the common interests of Agencies of Energy Management at a national level,

¹³ <http://www.camaradesevilla.com/noticias/la-c%C3%A1mara-de-comercio-y-el-ayuntamiento-de-la-cabezas-firman-un-convenio-de-encomienda-de>

¹⁴ <https://www.agenciaandaluzadelaenergia.es/>

¹⁵ <http://www.egegrup.com/aire/index.php>

¹⁶ <http://www.eneragen.org/>

exchanging information and good practices and acting as a single voice, both national and internationally, for Spanish agencies working in the promotion of energy efficiency and renewable energies.

9. **Covenant of Mayors** (*Pacto de los Alcaldes*)¹⁷ is the mainstream European movement involving local and regional authorities, voluntarily committing to increasing energy efficiency and use of renewable energy sources on their territories. By their commitment, Covenant signatories aim to meet and exceed the European Union 20% CO2 reduction objective by 2020.

For its unique characteristics - being the only movement of its kind mobilising local and regional actors around the fulfilment of EU objectives - the Covenant of Mayors has been portrayed by European institutions as an exceptional model of multi-level governance.

5. CONCLUSIONS: BARRIERS, GAPS AND GENERAL RECOMMENDATIONS

The Spanish Law, as well as regionally in Andalusia, foresees the figure of the energy manager. Furthermore, the Spanish National Institute for Qualifications (*INCUAL - Instituto Nacional de las Cualificaciones*) set the national professional qualification framework for training related to energy efficiency.

Indeed, existing degrees leading to a qualification related to energy management are of Level 3 (VET) and higher. Furthermore, Level 3 qualifications provide graduates with a professional certificate (*Certificados de profesionalidad*): an official instrument of accreditation of a professional qualification from the National Catalogue of Professional Qualifications. These certificates accredit a set of professional competences that qualify a professional to exercise a professional activity identified in the National Catalogue of Professional Qualifications.

Nevertheless, this certificate can also be awarded to experienced professionals, thus accrediting their professional experience, which we consider to be of high importance for this sector. Especially considering that the current training and qualification scheme does not take into account professional experience.

The main conclusion to be draw is that Level 3 qualification allows the access and is adequate to the profession of energy manager, even more so when considering the possibility of recognition of a profession from the National Catalogue of Professional Qualifications.

However, for professional courses there is not an official national certification provided by the State that assures the quality and professional recognition of such training, which results in an unregulated sector.

¹⁷ http://www.covenantofmayors.eu/index_en.html

Indeed, one can only find private companies teaching courses in the area of energy efficiency and there is no national certificate to accredit these professionals. This means that professionals currently working in this field are not required to possess any specific training, resulting in a major barrier to the nationwide certification and recognition of the profession.

Therefore, it is clear that there is an urgent need for homogenisation in this unregulated sector. This is even more important when we acknowledge the fact that are several organisations (public and private) trying to regular, foster or frame the figure of the energy manager and the rising importance of this professional profile due to the European objectives and policies.

Since there is a legal and professional qualification framework in Spain, the most important question lies in its applicability and certification and accreditation by the State.

6. REFERENCES, CONTACTS AND LINKS

Spanish National Plan for Energy Efficiency

http://www.idae.es/uploads/documentos/documentos_11905_PAEE_2011_2020_A2011_A_a1e6383b.pdf

Details on international norm ISO 50001:2011

<https://www.iso.org/obp/ui/#iso:std:iso:50001:ed-1:v1:en>

Directive 2006/32/EC on energy end-use efficiency and energy services

<http://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32006L0032&rid=1>

Royal Decree 235/2013 (*Real Decreto 235/2013*)

<http://www.boe.es/boe/dias/2013/04/13/pdfs/BOE-A-2013-3904.pdf>

Royal Decree 56/2016 (*Real Decreto 56/2016*)

<https://www.boe.es/boe/dias/2016/02/13/pdfs/BOE-A-2016-1460.pdf>

Directive 2012/27/EU on energy efficiency

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2012:315:0001:0056:EN:PDF>

Royal Decree 1177/2008 (*Real Decreto 1177/2008*)

<https://www.boe.es/boe/dias/2008/07/28/pdfs/A32557-32587.pdf>

INCUAL – Spanish National Institute for Qualifications

http://www.educacion.gob.es/educa/incual/ice_incual_ing.html

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ENAC – *Entidad Nacional de Acreditación*

<http://www.enac.es/web/enac/inicio>

Andalusian Law 1/2014 (*Decreto-ley 1/2014*)

<http://www.juntadeandalucia.es/boja/2014/58/1>

AENOR - *Asociación Española de Normalización y Certificación*

<http://www.aenor.es/aenor/inicio/home/home.asp>

EEV - *Escuela de Energía Verde*

<http://www.eeverde.com/>

ENFORCE Project

<http://www.enforce-een.eu/eng/>

APADGE - *Asociación Profesional Andaluza de Gestores Energéticos*

<http://www.apadge.com/>

STEEP Project

<http://www.steep.eu/>

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