

QUALIFICATION AND CERTIFICATION OF INSTALLERS IN ITALY

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ABSTRACT: The last two years have been characterized by impressive growth of installation. At present, according to GSE, the total power installed and operating amount to about 13 GW. Estimated PV-related labour places added to induced jobs amounted to 50.000 units. Only by paying serious attention to quality of training, the skills of the employers in the photovoltaic industry can raise, the companies will be able to improve the quality of professional services and meet the need of further professionalization of the staff.

Since 2011 the Italian certification and qualification system has been regulated by Legislative Decree 28/2011 implementing the RES Directive 2009/28/EC. In order to be qualified as professionals, the installers of PV systems need to attend to training programs in compliance with the criteria foreseen in Annex IV.

According to the 28/2011 Decree, the Italian certification learning programs will be managed by regional administrations, supported by ENEA - the Italian National Agency for New Technologies, Energy and Sustainable Economic Development- ensuring the homogeneous patterns and high quality content.

ENEA, thanks to its experience in training and for its qualified participation in working groups and in several European projects on renewable energy, has been developing a qualification scheme for RES installers of RES, including PV installers since 2007.

Mesos, which is ENEA's spin off and skilled training provider, has already experienced the ENEA model, providing successfully accredited courses for the qualification of PV installers. By passing final examination, the "certified installers" will be inserted in a national register by ENEA.

The ENEA model is a voluntary certification scheme much appreciated by end-users and training providers. Should the regional certification systems have accepted it, a unique certification scheme at national level would be created and single regional certification system avoided. The paper will show in details how ENEA is planning to fulfill with requirements foreseen on art. 15 of the Italian Leg. Decree 28/2011 by the end of December 2012.

Keywords: Education and Training, Dissemination, Photovoltaic Plant Installer, PV Market

1 INTRODUCTION

During the last years an impressive turnover has been generated: the budget for over 800 Italian companies operating in PV sector was very positive even if there were some speculative and opportunistic behavior.

On the other hand, the growth of the photovoltaic industry has recorded a positive effect on employment: estimated PV-related labour places added to the induced jobs amounted to 55000 units. Unfortunately, such market expansion has not been accompanied by an adequate growth of the national PV industry as well as a major involvement of the research sector.

The national market stimulation initiative, the "Conto Energia" Program (the Italian Feed-in-Tariff) has represented a long-standing sustained approach to market stimulation. At present two main barriers have emerged that could adversely affect the booming PV market in Italy: firstly, the adequacy of the electricity grid in some regions of Southern Italy, where the installed power of wind turbines and photovoltaic is almost in the same order of magnitude as the peak load and secondly, the annual cost of the incentive tariffs, that is rapidly approaching the budget limits fixed by the "Conto Energia" Program.

In this situation, the high quality of training became extremely important for professionals and technicians in the photovoltaic design and installation field.

2 MARKET SITUATION IN ITALY

2.1 Solar PV in Italy

In Italy three sectors of PV power system application can be identified:

- Off-grid non-domestic;
- On-grid distributed systems;
- On-grid centralized systems.

The cumulative installed PV power sums at present to around 15000 MW corresponding to about 425000 installations and an budget for the incentive tariffs of 6200 M€. In this contest, the governmental limit of 6700 M€ fixed by the fifth and phase of the "Conto Energia" program is expected to be reached within few months. When that limit is reached, the photovoltaic won't be incentivated any more in Italy.

The two governmental Decrees issued in 2005 and in 2006 defined the first phase of the program. The most significant installations were made by the end of 2006 and concluded by the end of 2009 with 5729 PV plant corresponding to about 163 MWp.

The second phase has been defined through a governmental decree issued in February 2007. This phase has been characterized by the release of the "Salva Alcoa" decree that extended the validity of the related tariffs from the end of 2010 to June 2011 for sworn declarations of construction completion recorded until 31 December 2010.

In this framework further 54106 installed plants, corresponding to a declared capacity of 3771 MW were admitted to benefit of the second Conto Energia tariffs. At the end of this phase 203000 have entered into operation, corresponding to a total capacity installed of over 6812 MW.

In July 2010 the III edition was issued. During its validity, from January to June 2011, a total power of 1546 MW was installed thanks to almost 38551 new plants. During this period excellent investment conditions due to the availability on the market of low price photovoltaic components caused a surge in installations, as a way to increase rate of incomes.

The IV Conto Energia was regulated by decree issued on 5 May 2011 [1]. The most important aspects regard a total spending limit corresponding to 6000 M€ that was reached by the end of August 2012. In this framework 178000 have been installed plants corresponding to a total power of about 6,458 MW.

The decree regulating the V “Conto Energia” has been issued on the 5th of July 2012 [2] and has been operated by 27 August 2012. By this decree the Italian Government is stating the end of incentives within the following few months.

The trend of the cumulative installed PV Power, from 2008 to August 2012, broken down into the four phases of the “Conto Energia” Program and shown in Fig. 1.

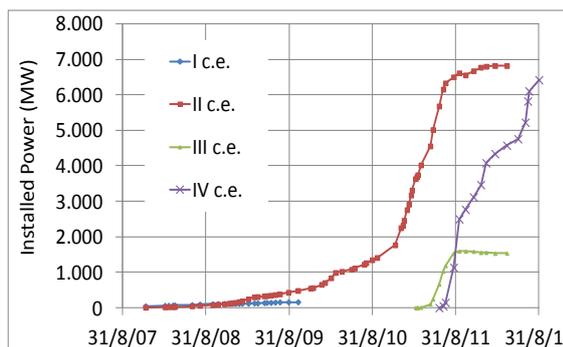


Figure 1: Installed power in 4-phases “Conto Energia”

2.2 Employment

In recent years the development of the PV market has been characterized by a constant instability in legislation causing discontinuity and a certain level of unpredictability of the market, but also its huge and rapid development in the last 5 to 6 years as well as great benefits for employment.

CRESME report [3] shows that the total investment in the PV sector rose from 2.5 billion in 2008 to 39 billion in 2011, reporting an increase by almost 16 times in 4 years, as shown in Fig. 2.

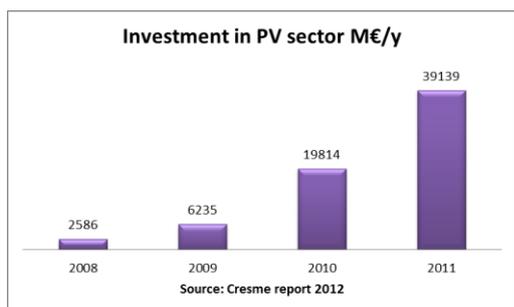


Figure 2: Investments in PV sector

GIFI, the Italian photovoltaic association, reports that in 2012 over 5.6 billion € / year have been invested for the next two years [4].

The PV macro sector includes the so-called satellite industries and involves primarily manufacturers of electronic and electrical systems. From the commercial and design point of view it affects distributors, integrators and engineering companies. Considering financial, regulatory and fiscal aspect PV sector involves bank and credit institutions, insurance companies, law firms, tax and notary.

Lastly the realization of the projects involves the construction companies, electricians, installers, and more specific operators working e.g. at disposal sites for eternit and asbestos, skills working on roofs and rooftops, energy certifiers..

According to the “Solar Energy Report” [5] from 2008 to 2011 photovoltaics jobs in Italy increased from 2,300 to over 18,000, an increase of about 8 times in 4 years (see Fig.3).

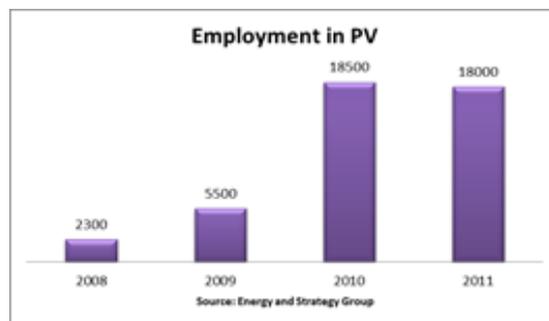


Figure 3: Jobs in PV sector

While investments doubled, the number of direct employees has seen a slight decline compared to the previous year, due to a combination of unfavorable factors: the financial crisis, the regulatory instability and a rapid reduction in operating margins.

This trend has been unfortunately confirmed also in 2012. The regulatory change in course for the V Feed-in-Tariff and the sudden drop in prices for photovoltaic components (mostly modules) is forcing many companies to reduce staff and, in extreme cases even resort to layoffs as a result of factory closures.

According to Confartigianato [6], the Italian Association of SMEs, between 2009 and 2012, in a period including the crisis and the subsequent partial recovery, the potential companies affected by the chain of photovoltaics and renewable energy in general has been increasing by more than 10%.

In a context characterized by a significant crisis in the building sector, the photovoltaic systems have shown far positive effects, significant benefits on economy and employment. According to the report of Confartigianato in 2011 the skilled building sector caused an over 10% annual growth of employment.

The development of photovoltaic industry has allowed many small and medium enterprises to explore new technological opportunities, converting its production, focusing on the downstream segments, especially the installation of plants as EPC. The Italian industry is serving a limited presence in the upstream stages, feedstock and cells. The excess capacity in the Far East and the U.S. and the capital intensive nature of the sector makes it impractical a significant Italian presence.

The Italian industry is strong in those areas with long-experienced production, although intended to other sectors [7]. It is evident the case of inverters made in Italy, which covers about 16% of world production in 2010, with nearly 5 GW manufactured in Italy (see Fig. 4).

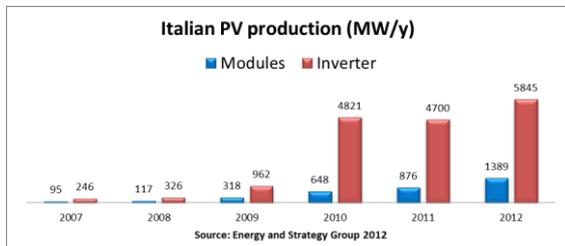


Figure 4: PV industrial chain: production

Thanks to the know-how, established brands, technologically advanced products and investment in research, national companies (and foreign companies with production sites in Italy), own substantial market share and also focused to emerging economies (see Fig. 5 and 6).

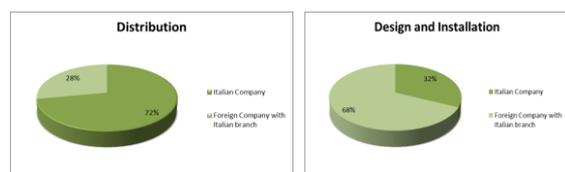


Figure 5/6 : PV Italian chain – other activities

In 2010 AIPPEG, the Italian association that brings together manufacturers of panels and corrugated elements has showed an increase in turnover of 20%, thanks to photovoltaics. In the same year, the growth rate of the number of companies was 13%. The majority of these companies are Italian and are contributing to the country's economic recovery by investing in production, research and development.

The numbers shown in the above Figures are a sign of an industry that, despite of many difficulties (global crisis, rapid decline in module prices, resulting in instability and unpredictability of the market rules) believes in the future of photovoltaic technology and is working well for overcome the dependence on incentives to full competitiveness

The highest concentration of national companies is detected in downstream stages, in particular in the generation and installation activities, as EPC contractor. These companies change strategies, focusing on rooftop plants and international business. To guard the national market they are offering "full service" solutions, including maintenance, servicing and domotics.

Weaknesses of Italian industries also depend on a policy that has failed to properly take advantage of the growth of the internal market as a base to support the development of a national chain. Alongside measures to the entire entrepreneurial, how to facilitate access to credit at a time of credit crunch and support R & D, you need a specific industrial policy. This, on the one hand to direct resources towards high value-added applications Italian, on the other hand push the strengthening of the sector, promoting the assembly and cooperation between small and medium-sized enterprises, including through tools such as districts and contracts the network.

Study Centre by Confartigianato, shows a direct correlation between the increase in the number of companies operating in the energy sector and the increase in solar installations.

3 ITALIAN FRAMEWORK AND LEGISLATION

3.1 The Italian "RES Decree"

The implementation of the European legislation on energy was initially implemented at national level by the Ministry of Economic Development, and, then, entered into force at regional level.

For the time being the RES Directive n.2009/28 has been implemented with the Italian Legislative Decree of March 3rd 2011. The implementation of art.14 of the Directive foresees that, by 31 December 2012, Regions, in compliance with "Annex 4" will set a training program for installers of RES plants or shall approve training agency.

In order to promote consistency with the criteria set out and the homogeneity at national level, or in the case regions do not fulfill with the statement within 31st December 2012, 'ENEA will provide training programs valid for the accreditation of trainers. Regions may also sign for agreements with ENEA for its support.

A list of qualified installers will be made available on the web by the issuing institution. Qualifications chased are available on the web, by the issuing institution.

For this reason ENEA, the National Agency for New Technologies, Energy and the Sustainable Economic Development, is now making all effort to share the training scheme set beyond the European Projects (Qualicert¹ and Compener) with Regions and to consider it as the first step to the identification of qualification schemes of RES installers

3.2 The Italian scheme for companies

Art.15 of Legislative Decree no. 28/2011 has recasted art. 4 of Ministerial Decree 37/2008 identifying requirements for installers of PV.

In 2008 Decree PV systems were classified by type and installation of plants was regulated. The installation of electric plants, which include the photovoltaic plants in Italy, is limited to installers with specific requirements. The installing company will appoint a technical manager, for issuing, the certificate of compliance once installation is completed. This certificate is a guarantee for the customer.

The technical manager must meet the technical and professional requirements required by art. 4 of MD 37/2008. He must either have a technical degree or a technical diploma with two years of experience, or a professional qualification in addition to four years of experience in the installation of electrical systems

3.3 The RES portal by GSE

In accordance with art. 15 of Legislative Decree No. 28 of 3 March 2011, the GSE² launches "Rinnova" web site, www.rinnova.gse.it, a new information section of its website dedicated to renewable energies and energy efficiency (Fig. 7).

¹ <http://www.utt.enea.it/chi-siamo/informazione-e-formazione-1/progetti>

² GSE is a state-owned company which promotes and supports renewable energy sources (RES) in Italy



Figure 7: GSE portal for RES

As to Legislative Decree No. 28 of 3 March 2011, the new portal provides information about incentives, benefits, best practices, standards and authorization procedures related to renewable energy.

The section 'Incentives' contains information on the incentives to produce electricity (Energy Account for photovoltaic and solar thermal, incentives for wind, hydro, biomass, geothermal, marine), hot and cold with renewables (Deduction of 55%, incentives for biomass, geothermal, heat pumps) and incentives for biofuels.

The second section is devoted to 'Best Practices', virtuous experiences of public administrations, citizens, associations and companies in the field of energy efficiency, renewable energy sources, rational use of energy, mobility and sustainable behavior. It is an open space to all, powered by the contributions of professionals who implemented projects and programs, for sharing their experiences.

In the section "read-more" you will find information on national and regional authorization procedures for the installation of renewable energy plants, and guides, economic, technical, legal and environmental sidebar and international comparisons.

"Rinnova" allows access to SIMERI, the Italian system for the statistical monitoring of electricity, heating and cooling and transport. This application allows monitoring the status of achievement of the national target of 17% by 2020 imposed by the EU Directive 28/2009. The evolution of consumption by renewable sources is shown, too.

3.4 First Italian Progress Report

Article 22 of Directive 2009/28/EC requires Member States to submit a report to the Commission on progress in the promotion and use of Energy from renewable sources by 31 December 2011-

The first Italian Progress Report [8] shows that in 2010 the overall shares of energy from RES amount to 10.1% (8.9% in 2009) and the share for electricity corresponds to 20.1% with an increase by 6.8%. The other shares refer to transport and heating and cooling.

The Renewable Energy contribution to final Energy consumption amounts to 12.887 ktoe (11.070 in 2009). The gross final consumption of electricity from RES corresponds to 5924 ktoe, with an increase by 9.9% respect to 2009³.

³ At present, September 2012, the Ministry of Economic Development is issuing an "Italian Energetic Strategy" reporting an increasing share of RES energy of 23% out of total consumption and over 38% of electric ones in 2011. They previous year their share was 11% and 23% respectively. In

In 2010 the total actual contribution as installed capacity and gross electricity generation from photovoltaic amounts to 3470 MW (1144 in 2009) and 1906 GWh (676 in 2009), with a respective increase by 203% and 182%.

In addition to Kyoto Fund (foreseen by the National Action Plan) the measures relative to Electric sector adopted by Italy are:

- Feed-in-Tariff for PV system - art.25.
- New incentives - art.24, not solar plants.
- International Cooperation Mechanisms - art 35-36.
- Training and Information - art.14 – it is a supplementary measure to the NAP, not a mandatory one. Its expected results are Information and change of behaviour to and for operators, designers, regions, local authorities, citizens, etc. The "Rinnova" web portal is a tool proved by GSE.
- Qualification system for installers – art.15 – to guarantee the quality of the RES systems. It refers to the professional qualifications for installation and extraordinary repairs of RES systems. The qualification is to be achieved by attending specific courses to be implemented by the Regions by December 2012.

4 DRIVERS AND BARRIERS TO CERTIFICATION OF INSTALLERS

4.1 Overview

In Italy the importance of certification of installers is confirmed by the 5th "Conto Energia", the new Italian incentive system for photovoltaic. Art. 5 of the "Conto Energia" states that in order to benefit of incentives, installation of PV plants has to be made by installers qualified as to Leg. Decree. n. 28/2011.

Till now it is not clarified who has to obtain the certification, whether it should be the "technical manager", as described in the Ministerial Decree 37/2008, or the installers/verifiers of the plants.

Leg. Decree 28/2011, following the Ministerial Decree 37/2008, has created a lot of confusion in Italy, even among professionals. Interpreting the law it seems that graduates and experienced technicians do not have to follow any training courses, because they are already in possession of the job requirements. But for operators who don't have a school diploma, but are experienced, it seems that they have to follow the training course and pass the final exam in order to obtain the qualification.

While waiting for Regions to issue qualification schemes for installers, ENEA, as required by the Decree, is providing a comprehensive training program at national level, as implementation of the European Directive 2009/28/EC and the "European Qualifications Framework".

4.2 The European Qualification Framework EQF

The EQF is a common European reference framework which links countries' qualifications systems together, acting as a translation device to make qualifications more readable and understandable across different countries and systems in Europe. It has two principal aims: to promote citizens' mobility among countries and to facilitate their lifelong learning.

The EQF will relate different countries' national

2010 the dependence from non-RES has decreased from 87% to 75%.

qualifications systems and frameworks together around a common European reference – its eight reference levels. The levels span the full scale of qualifications, from basic (Level 1, for example school leaving certificates) to advanced (Level 8, for example Doctorates) levels. As an instrument for the promotion of lifelong learning, the EQF encompasses all levels of qualifications acquired in general, vocational as well as academic education and training. Moreover, the framework addresses qualifications acquired in initial and continuing education and training.

The eight reference levels are described in terms of learning outcomes, knowledge, skills and competence. In the EQF, a learning outcome is defined as a statement of what a learner knows, understands and is able to do on completion of a learning process.

This signals that qualifications – in different combinations – can capture a broad scope of learning outcomes, including theoretical knowledge, practical and technical skills, and social competences where the ability to work with others is crucial.

4.3 Skills and training requirements

Experience has shown that photovoltaic installations have special requirements that installers certified in electricity cannot always cope with, even if they have the formal certifications to do the installation work.

The basic occupational skills required in photovoltaic project development, installation, and maintenance are already delivered through existing programmes of education and training.

The main skills involved in photovoltaic installations are related to electricity. Existing technical and university courses provide good basis for working at basic level work in electrical sector.

However, even with the basic skills requirements of most jobs in PV also require more specialized skills in the sector, and in some cases benefit from skill sets that cross existing occupations.

Most of the skills response to the needs of the renewable energy sector is about delivering these specialized and cross-disciplinary skills, either through providing initial education and training courses and apprenticeships specialized in renewable energy, or through providing supplementary education and training in renewable energy to build on existing skills.

The ENEA scheme offers a forty hours specialised training and includes a final exam, addressed to installers of the electricity sector with at least one year of experience and basic knowledge of electrical systems and electrical engineering.

The goal of the specialised training, according to the ENEA scheme, is the acquisition of knowledge, skills and expertise needed for the installer of photovoltaic systems: knowledge of technology and plant engineering, of design principles and of criteria and procedures for the maintenance, skills for the identification of system failure, and expertise of the dedicated legal requirements, the European aspects of the certification the technical regulations of European and international product certification, and knowledge of the legislation on health and safety at work.

4.4 Technical Equipment for practical training

According to Annex 4 of Directive 2009/28/EC installer training must include a theoretical part and a practical part. For the development of the practice

suitable equipment is necessary so that installers can practice during training, and will be able to perform the practical during the final exam.

Training institutions do not always have the appropriate equipment to carry out practical tests of installation, maintenance and functional testing of photovoltaic.

In some cases the manufacture companies supply components, technical equipment and measuring instruments for the practical training. Training in the photovoltaic industry is often carried out by companies in the sector, for example by manufacturers of modules, inverters or support structures. These companies give very little attention to the theoretical training on technology and often focus more on marketing or on the product itself, but are very well equipped. They possess laboratories and equipment to carry out the training.

ENEA proposes to create a map of all training centers equipped for the practical part, including manufacturers and educational institutions that are equipping with small systems created with the contribution of manufacturing companies, such as the “Fondazione Fenice” in Padua or the “Fondazione ITS” in Siena.

5. THE ENEA CERTIFICATION SCHEME

5.1 Qualified courses for PV systems installers

ENEA aims to promote an educational and highly qualified training, homogeneous at the national level, encouraging the employment and movement of professionals in national and European level, consistent with the guidelines laid down by the main planning documents at European, national and regional authorities. The ENEA model, which is a voluntary certification scheme and much appreciated by training providers, still needs to be incorporated into regional certification systems, to create a unique certification scheme at national level, and avoid that each Region issues its own certification system.

The ENEA model is available to qualifying companies, educational institutes, professionals interested in training and qualification of installers, but also aims to support the Regions in the discharge of their duties, as provided by the Legislative Decree 28/2011.

The qualifying courses for installers are based on a balanced mix between theory and practice, the contents and characteristics of the courses complies with Annex IV of the Ministerial Decree 28 implementing Directive 2009/28/EC. are also designed for the training of knowledge, skills and competencies necessary for installers of photovoltaic systems. The scheme, proposed by ENEA, fully fulfills the requirements reported in the RES Directive.

The ENEA certification path can be summarized as follows:

- the training courses are held mainly in demonstration plants and include at least one day of practical training, including the use of typical instruments for the PV system safety check.
- the certified courses includes theoretical and practical sessions, are continuously monitored, the teachers need to be qualified, the classes have not more than twenty students to ensure the best ratio teacher/students, the didactic material has been checked by experts, all the students have to express their judgment not on the whole course but on the single subjects as well on the single teachers.

5.2. Training the trainers

The various activities and responsibilities provided by the ENEA model, will require the involvement of highly qualified personnel, thus ENEA plans to set up training for the qualification of trainers (i.e. engineers or installers with skilled experience in photovoltaics).

ENEA has intentions to provide training courses for third-party certification for the training of teachers. This scheme ensures consistency of programs and high level content for the whole Italian territory.

According to ENEA model, all courses, for the training of trainers and for the certification of installers, include the possession of specific entrance requirements, as basics knowledge, skills and competences (Fig. 6).

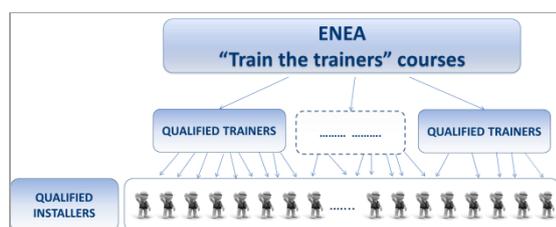


Figure 6: ENEA qualification scheme

In this initial stage, the learning contents can be acquired, if necessary, by using the e-learning courses, which are available, free of charge, on ENEA e-learning platform, dealing with the basics subjects that are introductory for the face to face courses.

5.3 ENEA courses and SolarNet

After the validation stage, the ENEA scheme has been tested in the field thanks to the realization of certified courses for PV installers by MESOS⁴, which is ENEA's spin off and skilled training provider.

Starting from 2007, ENEA and MESOS have obtained the certification for the training courses in photovoltaic sector, issued by CEPAS, the national Certification Body for Personnel and Training courses. The training course is registered at n. 94 of CEPAS register.

The training courses organized by ENEA and Mesos are addressed to electricians, installers, designers, engineers and architects.

One of the most qualifying aspects of this methodology is the structure of blended courses, designed to facilitate access to specialist training of learners in the classroom. The preliminary learning contents and basic skills can be acquired, if necessary by using the e-learning courses, specially designed to facilitate access to specialist training of learners in the classroom. The preliminary learning contents and basic skills can be acquired, if necessary by using the e-learning courses, specially designed, which are available on ENEA e-learning platform. This scheme requires that the almost two trainers are qualified by a third part.

Mesos, following the ENEA qualification scheme, has developed a five-day photovoltaic installation course, with final examination, structured in 5 formative steps.

Step 1. Basic E-learning training of 40 hours, provided by the ENEA e-LEARN platform, asynchronously. ENEA and Mesos provide e-learning courses to make it easier for professionals to deal with

the basics of photovoltaic technology in their daily work. The e-learning course on electricians and photovoltaics are designed to help them to pass the entrance exam.

Step 2. Intermediate test, useful to check the minimum cognitive requirements needed for optimal achievement in the course and also requested in Annex IV of the Decree. 28/2011.

Step 3. Specialized training in the classroom, consists in lectures, tutorials, individual and group lessons and practical tests of photovoltaics.

Classroom training meets the standard ISO IEC 17024, as the course is qualified by an independent third party, CEPAS - Body of professional qualification and training.

Step 4. Final examination to verify the knowledge and skills acquired through a written test, a practical test and an oral exam.

Step 5 Issue of the certificate of passing the final exam provided in accordance with the ENEA scheme, which also applies to initiate voluntary CEPAS certification.

Thanks to its experience in training Mesos has created a network of over 300 qualified professionals named Solar Net (Fig. 7). The network consists of designers and installers of photovoltaic systems, formed since 2007, who work throughout Italy.

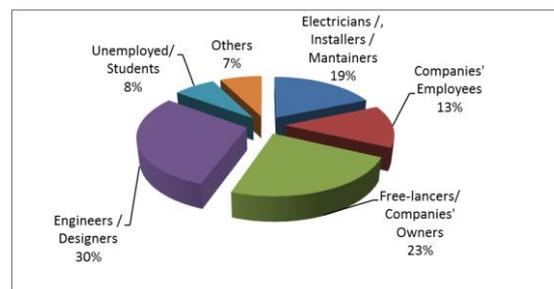


Figure 7: SolarNet professionals

SolarNet is addressed to professionals interesting in standing to stand out with their professionalism and in providing greater assurance, transparency and quality to the customer.

The network provides the opportunity for installers and designers graduated from a Mesos photovoltaic course to share knowledge and experience, to provide design and skilled advices, as well as innovative and qualified services to the consumer.

6. CONCLUSION

The legislative decree n. 28/2011, transposition of the Directive 2009/28/EC, recognizes ENEA (National Agency for New Technologies, Energy and Sustainable Economic Development) the role of supportive body to the twenty Italian Regions for the definition of the certification process, to be achieved by 31st December 2012.

ENEA has participated in several European projects – “Qualicert”, “Compener” and “Build Up Skills” - for the qualification and certification of new professionals in the energy field.

With the project “Qualicert” before and with the project “Compener” now, were defined patterns of qualification and professional certification for different professional groups, including the installation of photovoltaic systems, based on the European Qualifications Framework (EQF).

⁴ www.portalemesos.it

The aim of “Build up skills” project coordinated by ENEA is to create a sole certification system and avoid regional ones.

ENEA has defined a strategy together with all stakeholders in order to achieve a uniform education system at national level for the qualification certification of installers of renewable energy sources.

The strategy promoted by ENEA consists of an action plan to implement a system of qualification / certification in line with European legislation. In particular, it is planned:

- to promote the training of trainers in order to standardize training throughout the country, currently managed at the regional level and by various associations of installers or by the companies themselves;
- to identify the public and /or private training centers throughout the country where to conduct courses for installers.
- to define the technical standards for the profession of installers.

Moreover, in a time of economic crisis, investing in human resources is certainly a winning strategy, because we expect that the market will reward skilled professionals, and virtuous companies.

The availability of qualified personnel in this field is a requirement for access to incentives, but also a guarantee for the consumer and for the growth of photovoltaics.

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