

Training and Certification of PV Installers in Europe

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Abstract

The high photovoltaic (PV) market growth rates, which are further favored by the EU supporting policies and the national regulatory frameworks, may result to a threat for the PV industry due to the lack of adequately skilled workforce for PV installation and maintenance. This fact may result in poorly installed systems with negative impact on the industry's credibility and development. The PVTRIN, an Intelligent Energy Europe project, addresses to these issues by developing a training and accreditation scheme for technicians/engineers focusing to the installation and maintenance of small scale PV systems. The training and certification will incorporate the criteria set by the 2009/28/EC Directive regarding requirements for certified training courses and training providers, providing a supporting instrument for EU Member States to meet their obligations for acknowledged certifications for RES installers till 31/12/2012. Creating a qualified PV installers workforce, the increased confidence of potential PV owners will lead to market growth.

Keywords: photovoltaic, certification, RES installers, PV installers training

1. Introduction

The world photovoltaic market has shown a continuous growth for the last ten years. From the first applications, more than 40 years have passed. The annual market has developed from less than 1 GW in 2003 to more than 7.2 GW in 2009. Despite the difficult financial and economic circumstances, the PV market grew by almost 15% in 2009 -compared to 2008 and the total power installed raised to 22.9 GW [1]. The robust growth is expected to continue in the coming years, according the industry's scenarios (Fig.1).

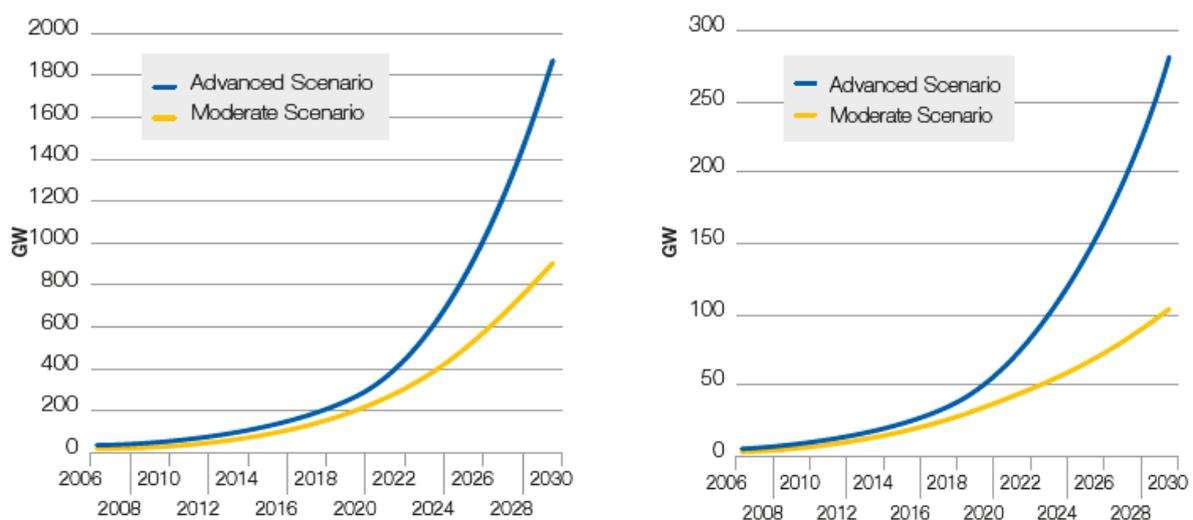


Figure 1 – Global PV cumulative (left chart) and annual capacity (right chart) installed up to 2030 [2]
— Advanced Scenario (based on the assumption of continuing and additional support mechanisms)
— Moderate Scenario (development of PV under a lower level of political commitment)

Europe is leading the way, representing about 70% of the world cumulative PV power installed at the end of 2009. PV/BIPV applications are supported by different regulatory frameworks at European level. Moreover, many countries have already adopted appropriate support policies and they have defined favorable support schemes and financial mechanisms into their national laws, in order to fulfill certain targets; feed in tariffs mechanisms have played an important role to the market's awakening [3]. The EU PV market has been booming over the last decade and, according to the industry's forecasting scenarios, this trend will continue during the next years. These factors have result to a 16 GW of cumulative installed capacity at the end of 2009 with almost 5,5GW installed during 2009 [4].

Although the European growth will be affected by the global financial crisis, most EU markets will continue to grow fast. According to the industry's forecasting scenarios, the total installed capacity may reach the 7.980MW (moderate scenario) till 2014, or even the 13.745MW (advanced scenario), (Fig.2). Furthermore, a significant expansion on BIPV capacity is foreseen (7.203MW in 2020, from 33MW in 2008) [5].

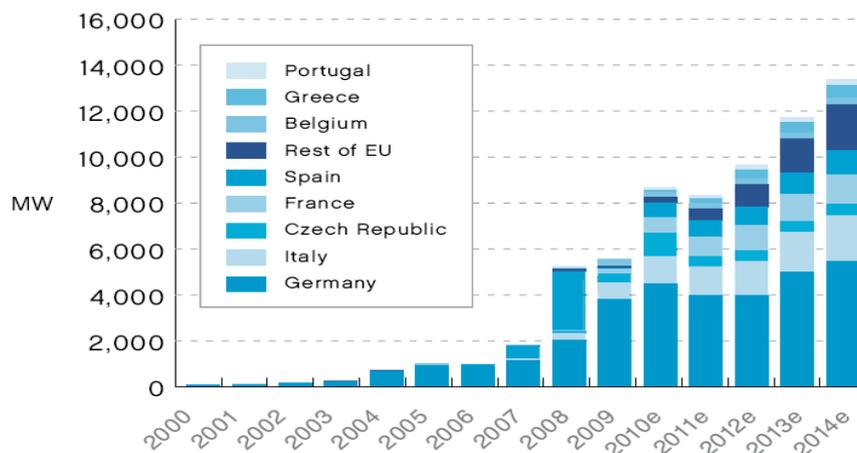


Figure 2 - Scenarios for the European PV market development till 2014 [1]

According the PV industry estimations, 53 jobs are created per installed MW, 10 jobs for production, about 33 for the process of installation. In 2008, over 130,000 people were employed directly by the EU PV industry plus 60,000 people indirectly [6]. By 2030, following to the Advanced Scenario, 10 million full-time jobs will be created by the development of solar power around the world; over half of those would be in the installation and marketing of systems (Fig. 3) [2]. In EU27, PV jobs may expand to 727,000 in 2020 and 1.4 million in 2030; major growth to PV installation related jobs (Table 1). The above figures illustrate that the fast growing PV penetration may prove as a threat for the PV industry due to the lack of adequately skilled workforce for PV installation and maintenance. This fact may result in badly installed systems with negative impact on the industry's credibility and development.

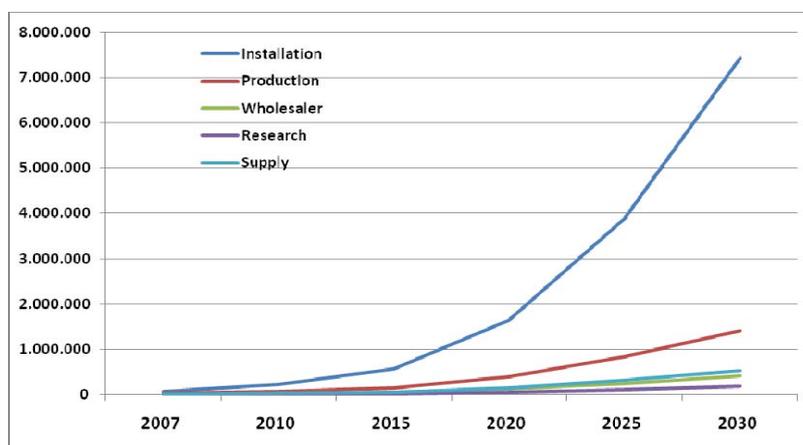


Figure 3 – Worldwide employment in PV-related jobs (Advanced Scenario)

Table 1 – EU PV jobs Calculations [7]

	2007	2010	2020	2030
Installation and Wholesale	71.298	147.500	578.500	880.351
Production/Research/Supply	8.642	23.533	148.066	529.324
Total PV jobs (EE-27)	79.940	171.033	726.956	1.409.676

Based on the above fact, it is obvious that there is a transnational market need for establishing common qualification frameworks, appropriate training methodology and tools and finally a transparent and clearly defined accreditation route which will validate the competence of the installers. Furthermore, the interested parties (developers, designers, potential users) will eventually seek/demand for acknowledged standards, skills certification and quality assurance throughout the development of a PV/BIPV application (design, installation, and maintenance) [8].

The PVTRIN project will assist the market to overcome the barrier of the lack of competent PV installers by developing an appropriate training course and a certification scheme for PV installers; which will identify common quality standards on PV installation and maintenance and will provide the key components for developing a European acknowledged certification scheme. It will be addressed to technicians/electricians/engineers and will be focused on the installation and maintenance of PV/BIPV systems in buildings.

2. Methodology

The lack of a competent installers' workforce, to cover the market needs, is more evident in the South-Eastern Europe, where there are few/or none relevant training and no available accreditation schemes.

PVTRIN project will be implemented in a balanced group of regions with different market maturity, including countries with a high PV penetration and significant experience in BIPV installation (Spain), others with a recently market awakening and large potential (Greece, Cyprus, Bulgaria), others with poor market performance (Romania, Croatia) and finally countries with successful examples and extended knowhow on developing vocational accreditations standards (UK).

Table 2 – List of participating organizations and countries

Project Partners	Country
Technical University of Crete Department of Environmental Engineering, Renewable and Sustainable Energy Systems Lab (project coordinator)	Greece
European photovoltaic Industry Association	EU
Fundación Robotiker	Spain
Building Research Establishment Ltd	UK
Scientific and Technical Chamber of Cyprus	Cyprus
Technical Chamber of Greece – Branch of Western Crete	Greece
Agency of Brasov for the Management of Energy and Environment	Romania
Energy Institute Hrvoje Požar	Croatia
Sofia Energy Centre	Bulgaria

Training opportunities are currently very limited or inexistent in most of the countries participating to the project (existing training opportunities provided by manufacturers are mainly for their own products). The situation in participating countries is described below:

Table 3 – Professional training and certifications schemes for PV Installers in the participating countries (2009)

Country	Training courses/efforts	Certification schemes
Greece	Distance learning program, non acknowledged Seminars by technical universities (targeted to students and postgraduates) Technical guides/ support material from manufacturers	None
Cyprus	Training efforts by PV enterprises Seminars/workshops by academic institutions not for installers but government officials, academics etc.	None
Romania	Training provided by distributing companies on the equipment they deliver	None
Bulgaria	None effort mentioned	None
Croatia	Training mostly provided by distributing companies Some training efforts by RES industry	None
Spain	A number of training courses in solar energy, addressing to installers; both types: e-learning and physical attendance. Most important from: · CENSOLAR for solar energy installers · University of Jaen, web seminar –including BIPV issues too.	None acknowledged as a professional standard. CENSOLAR holds ISO 9001 in designing training for RES
UK	A number of certified training courses already exist. Experience in designing, delivering vocational training programme in cooperation with professional associations	Yes, i.e. City & Guilds - Certificate in Installing and Testing Domestic Photovoltaic Systems. Department of Energy and Climate Change - Microgeneration certification scheme (MCS)

3.1 Development of the action plan

The PVTRIN action plan foresees the:

- Comparative analysis of industry/market needs on PV/BIPV installation and maintenance through Europe, as well as national legislative and normative framework
- Definition of professional frameworks for PV installers and development of an appropriate training methodology
- Development of appropriate training material for installers and trainers; also practical training tools and an e-learning platform for a flexible and adaptable training procedure
- Development of a transparent and clearly defined certification scheme -focused on small-scale applications, in order to accredit the training course for installers and to provide common quality standards within EU countries
- Implementation of pilot training courses in 6 participating countries, resulting to a pool of skilled and certified PV installers in the participating countries
- Evaluation of the main developed methodologies, materials and tools, in order to ensure that the project's outcomes will match the pre-decided quality standards
- Establishment of a mechanism to facilitate replication and exploitation of projects deliverables throughout Europe

In order to achieve maximum consensus, the consortium partners aim to involve all stakeholder groups and key market actors in the project's activities; i.e. PV Industry (producers, wholesalers and intermediaries), Academic and Accreditation bodies, Professional associations, developers and engineers. Furthermore, in order to facilitate the transferability of the PVTRIN certification scheme

and to promote its adoption by as many EU Member States as possible, the consortium has foreseen the following:

- The PVTRIN's outcomes will comply with the RES Directive (2009/28/EC) requirements for acknowledged certifications for RES installers [9]
- Integration of transnational data – Exploit synergies with PV stakeholders and relevant initiatives
- Scenarios to facilitate adaptability
- Encourage “ownership” of the certification schemes in each Member State
- Networking and disseminating in a European level; informational campaigns targeting to decision makers

3. Results

The PVTRIN activities will result to:

- Raised knowledge of good practices and “key-parameters” for effective PV/BIPV installation/integration
- Accredited training courses and training providers formulating an operational certification scheme for PV installers in participating countries
- A pool of skilled, certified PV installers, in participating countries; min 160
- Encouragement of a greater number of technicians to advance their professional skills
- Increased awareness for the benefits of engaging certified installers
- Certification documentation and guidelines for the replication of the actions to be presented to policy / decision makers throughout Europe
- A roadmap for the replication of the training and the adoption of the certification scheme across Europe

Long term, PVTRIN will:

- contribute to the PV/BIPV market growth in the participating countries
- facilitate job mobility within Member States
- provide a supporting instrument for EU MS to meet their obligations for acknowledged certifications for RES installers till 31/12/2012
- enforce the MS efforts to achieve the mandatory target of a 20% share of energy from RES in overall Community energy consumption by 2020.

The trained technicians/installers who will participate to the project's activities will obtain professional competitive advantage, through the improvement of their technical skills/knowledge on PV/BIPV installations; their certification will provide them the “passport” in the job market in other EU countries. They will also benefit from the training material and tools platform, which will provide them with a 24/7 access to a “technical library”. Moreover their presence in the database among certified installers will distinguish them from other installers.

Developers and engineers will profit by the existence of technicians with proven professional competence. PV installation owners and potential users will gain confidence that appropriate levels of quality and performance are being met and maintained during installation and maintenance of their PV system; eventually their system will be more efficient and they will meet less unpleasant experiences from installation/maintenance failures.

Academic bodies and technical training organisations will benefit from the development of a transnational acknowledged training course, in their national language, which could be incorporated in their training courses; the PVTRIN consortium will address them as an appropriate channel for the continuation of the training courses and the exploitation of the produced training material and tools, after the end of the project.

4. Conclusions

The lack of skilled installers' workforce for the installation and maintenance may result to technical failures of the installed PV/BIPV systems. The establishment of common acknowledged quality standards to professional training and certification of PV installers will contribute to the healthy development and will defend PV technology's credibility from poor demonstrations.

Creating a more qualified PV installers workforce, the increased confidence of potential PV owners will lead to market growth. More qualified PV installers means more effective operation of PV systems, better maintenance procedures, less maintenance costs. The increased credibility of PV installations will improve PV products image with direct benefit to PV industry. Moreover, constructors, engineers and potential PV owners will benefit from the existence of a qualified, according common quality standards, PV installers workforce.

In long term the project will contribute to the Member States efforts to achieve the mandatory target of a 20 % share of energy from renewable sources in overall Community energy consumption by 2020. Apart from the directly involved parties, the entire society is to benefit from PVTRIN. By increasing the PV technology penetration to the energy mix, greenhouse gas emissions will be reduced, citizens' quality of life will be improved.

5. References

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