



## **Strategic Workshop**

***“Training and qualification of small-scale RES installers in Europe”***

**12<sup>th</sup> March 2013, 12:00 – 18:30**

***Proceedings***

**Venue:**  
**Confédération Construction**  
**34-42 rue du Lombard**  
**Brussels, Belgium**

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## Introduction

The strategic workshop "Training and qualification of small-scale RES installers in Europe" was held in Brussels, Belgium, on 12 March 2013, in the framework of Install+RES and PVTRIN projects.

The event, organised by the PVTRIN & Install+RES consortia, aimed to provide relevant stakeholders with an overview of the roadmaps for qualifying the building workforce in Europe until 2020. During the event, developed schemes, guidelines and practical tools for implementing training and qualification schemes for installers of small-scale renewable energy sources (RES) systems in buildings were presented. These tools were represented by the Install+RES and PVTRIN projects, which have the aim to implement training courses for installers of small-scale RES systems in buildings in several European countries. During the event, two panel sessions has been also organized in order to address the needs related to the training and qualification of installers of small-scale RES in buildings in the certification field and from the market's point of view.

The event was organised at the Confédération Construction, 34-42 rue du Lombard 1000, Brussels, Belgium, with the support of the European Commission under the Intelligent Energy Europe (IEE) Programme.

Information on both projects and the programme of the event are available at the link:

<http://www.installers-certification.eu/homepage/>

The presentations of the event are available at the link:

[http://pvcert.gr/en/news/el\\_strategic\\_workshop\\_training\\_and\\_qualification\\_of\\_smallscale\\_res\\_installers\\_in\\_europe\\_brussels\\_12\\_march\\_2013\\_1.html](http://pvcert.gr/en/news/el_strategic_workshop_training_and_qualification_of_smallscale_res_installers_in_europe_brussels_12_march_2013_1.html)

This document presents the proceeding of the event.

## 1. Welcome and introduction to the workshop

**Theocharis Tsoutsos, Technical University of Crete (TUC), PVTRIN project coordinator**

Theocharis Tsoutsos opened the workshop, introduced the workshop objectives and agenda to the audience and welcomed all participants.

## 2. Session I - Skills development for the EU RES Installers

**Chairperson: Evelyn Schellekens, General Secretary, European Association of Electrical Contractors (AIE)**

Evelyn Schellekens opened the first session of the workshop related to the skills development for the European installers of renewable energy systems. She highlighted that two main questions should be addressed during the workshop: how to provide qualified installers of RES and how to provide qualified trainers for the installers. Afterwards she welcomed on the stage the first speaker of the session I: Mr. Gianluca Tondi, from the Executive Agency for Competitiveness and Innovation (EACI) of the European Commission.

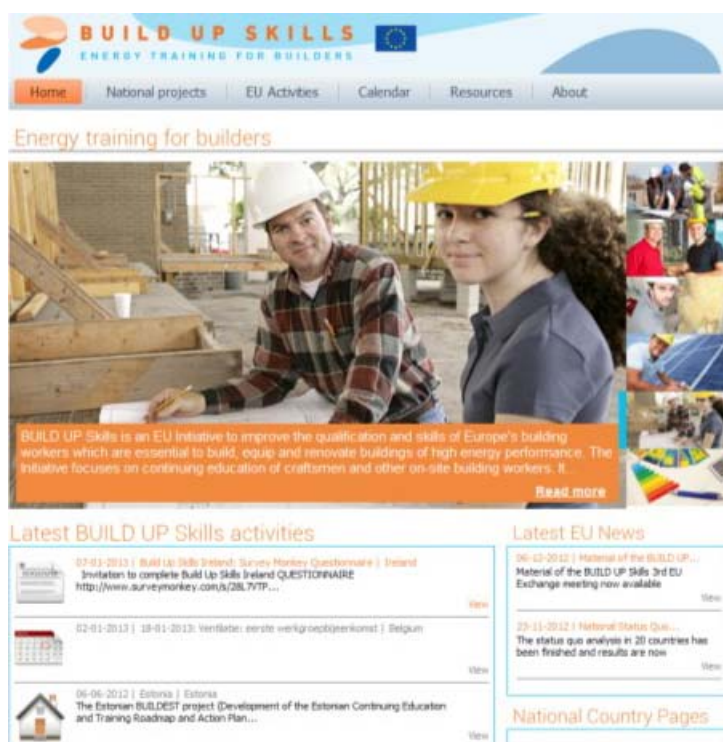
### 2.1. The BUILD UP Skills Initiative of the Intelligent Energy Europe Programme

Gianluca Tondi presented the BUILD UP Skills the EU initiative that is focused on continuing education and training of craftsmen and other on-site construction workers and system installers.

It is based on two pillars: a strategic one, named pillar I, and an operational one, named pillar II. The Pillar I aims to initiate national discussion processes with all relevant stakeholders, to identify and quantify needs for a workforce qualified in energy efficiency and renewable energy in each Member State by 2020 and beyond and finally to launch national qualification roadmaps – set up and agreed to achieve the 2020 sustainable energy policy objectives.

The aim of Pillar II is to further support qualification and training schemes. The initiative Pillar I has already been launched and counts of 30 projects, one project per country. Some National roadmaps are already available under the BUILD UP Skills website <http://www.builtupskills.eu/>. All roadmaps should be available until September 2013. In order to select the projects for the initiative Pillar II, the European Commission has opened a call for proposals, whose deadlines are 30<sup>th</sup> April 2013 and 28<sup>th</sup> November 2013. The projects to be selected for the initiative Pillar II have to refer to the roadmaps identified by the projects co-financed under the Pillar I. Evelyn Schellekens highlighted that initiatives such as BUILD UP Skills are very important to support National actions and initiatives for the workforce development and employability.

A number of EU exchange activities are organised at EU level to underline the European dimension and to foster the learning among countries. (BUS working group, EU exchange meetings, peer review activities). Closing Mr Tondi provided examples of activities within the priorities of Pillar II and invited participants to visit the BUILT UP Skills portal, [www. builtupskills.eu](http://www.builtupskills.eu).



## 2.2. *EU Policies in the area of skills development*

### ***Gelu Călăcean, Policy Co-ordinator, EMPL C3: Skills, Mobility and Employment Services, European Commission***

Gelu Călăcean provided the participants with an overview of the European instruments and networks related to the labour market, focusing to qualification, skills and employability. Within these tools and networks are the European Sector Skills Councils, Cedefop, Eurostat, and European Vacancy Monitor. They are fundamental to support the development of skills policy, with country-specific recommendations, benchmarking, skills and knowledge alliances, and the European mobility of skilled workers. Mr Călăcean presented in more details the EU Skills Panorama initiative that provides information and intelligence that can:

- Help improve the capacity for skills assessment and anticipation
- Inform skills governance through the anticipation of skills needs; improving responsiveness of education and training systems; and enhancing the matching of supply and demand for labour across Europe.

## 2.3. *Elaboration of the BUILD UP Skills national roadmaps: the experience of Belgium*

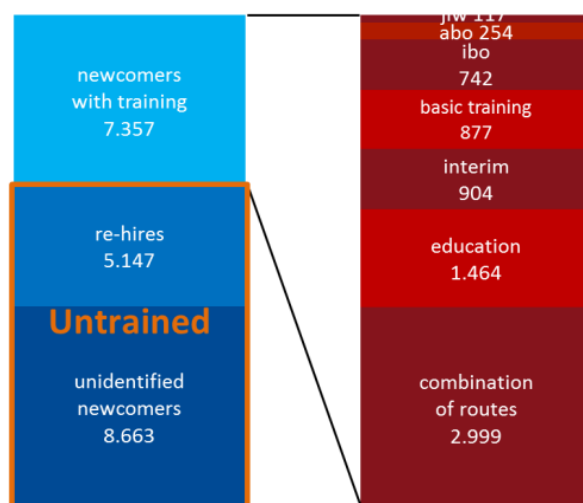
### ***Kristof Van Roy, fvb-ffc Constructiv***

Kristof Van Roy provided an overview of the development of the Belgian BUILD UP Skills roadmap. In order to achieve its the roadmap focused on improving the skills of blue collar workers in the energy efficiency and renewable energy sectors. The roadmap has been developed with a three steps approach:

- Identification of the National Status Quo

- Set up of the platform of stakeholders
- Development of the Roadmap

The status quo in Belgium is shown in the graph below which clearly shows that more than two third of the workers are untrained.



This will generate in the short term a shortage of unskilled construction workers, which is due mainly to the following barriers:

- existing training courses are too theoretical;
- technical progress is not being followed up on soon enough;
- the way in which work is organised does not allow workers to be sent for training.

In order to overcome these identified barriers a platform of stakeholders has been set up to develop the roadmap to avoid the shortage of unskilled construction workers in the market. The stakeholders involved in the definition of the roadmap were social partners, training centres, manufacturers of construction materials, EE and RES organisations.

The roadmap focused on the following 9 themes:

- Post construction wall insulation
- Ventilation
- Replacement of windows
- Heat pumps
- Solar thermal and PV
- Solar screening
- Roofing
- Interaction between professions
- Airtightness

The part of the roadmap related to RES (Heat Pumps, Solar thermal and PV) focused on three main themes: quality, strengthening collaboration with relevant stakeholders, training and education. Quality could be reached by making use of the following tools: quality label, checklist, certification, link between “grants” and quality and by uniformity across regions.

The main outcomes defined in the roadmap related to training and education highlighted three main aspects:

- Practical, flexible and short training modules
- Training modules per craft and per level
- Set up of a qualification on renewable energy

Evelyn Schellekens highlighted that it is also relevant to focus on the mobility of workers in and among the countries. Afterwards she invited the Manfred Wolf, from ALP, and Theocharis Tsoutsos from Technical University of Crete (TUC) to come to the stage in order to provide the participants with an overview of the tools available in Europe for implementing the Build Up Skills roadmap in the RES sector: the Install+RES and PVTRIN projects.

#### **2.4. The Install+RES initiative – Overview**

***Manfred Wolf, Academy for Teacher In-Service Training and Staff Development (ALP) (on behalf of Sofia Arancon, WIP – Renewable Energies)***

The aim of the Install+RES project is to provide the European building sector with qualified trainers and installers of small-scale renewable energy source systems, namely photovoltaic, solar thermal, biomass for stoves and heat pumps, in Germany, Poland, Italy, Slovenia, Bulgaria and Greece. Up until now 78 trainers have been qualified, 18 courses implemented and 268 installers qualified in the field of small-scale renewable energy source systems for buildings.

#### **2.5. The PVTRIN initiative – Overview**

***Theocharis Tsoutsos, Technical University of Crete (TUC)***

The aim of the PVTRIN project is to develop a certification scheme for installers of small scale PV systems in Greece, Bulgaria, Croatia, Cyprus, Romania and Spain. He focused on the value of the certification and the benefits for the installers, the PV industry and the society. Theocharis Tsoutsos highlighted that there is a high request of implementing the certification scheme developed within the frame of PVTRIN in other European countries.

After the overview of the Install+RES and PVTRIN project, Evelyn Schellekens invited the participants to address questions to the speakers. One of the questions was related to the availability of the material developed within the projects. Manfred Wolf mentioned that the Install+RES training material is public available and will be uploaded in the Install+RES website. Theocharis Tsoutsos also mentioned that all documentation related to the PVTRIN project has been evaluated by the key stakeholders in each PVTRIN country and it is public available in 6 languages, and can be downloaded from the website of the PVTRIN project. Evelyn Schellekens mentioned that there is a high demand of training material for RES installers. She will disseminate the Install+RES training material through the network of members of AIE.

Domenico Campogrande mentioned that he will also disseminate the Install+RES training material through the network of members of FIEC. It has been mentioned that one of the key point to guarantee the successful of the certification scheme is the involvement of the social partners. Another key point is the harmonisation of the basic competences and the mutual recognition of the certificates. Gianluca Tondi from the European Commission highlighted the relevance of ensuring the long term sustainability of the products, tools and documentation developed within the projects.



Evelyn Schellekens thanked the speakers of the session I, the participants for their attention and left the floor to Domenico Campogrande from FIEC to proceed with the session II, which provided further details on the Install+RES and PVTRIN projects.

### **3. Session II - “Install+RES” - Training courses for trainers and installers of small-scale renewable energy systems in buildings**

***Chairperson: Domenico Campogrande, FIEC (on behalf of Silvia Caneva, WIP – Renewable Energies)***

Domenico Campogrande opened the session II of the workshop by inviting Manfred Wolf to come to the stage for the presentation “Install+RES training courses for trainers and installers of small-scale RES in buildings: training material and didactical approach”.

#### **3.1. *Install+RES training courses for trainers and installers of small-scale RES in buildings: training material and didactical approach***

***Manfred Wolf, (ALP)***

Manfred Wolf focused his presentation on the training material and didactical approach adopted during the Install+RES project. He highlighted that qualification is the corner stone of RES quality and he mentioned that the teacher should be seen as agent for the energy change.

The presentation of Manfred Wolf provided the participants with an overview of the “train the trainers” course organised in Munich, Germany, during the Install+RES project, on PV, Solar thermal, heat pump and biomass technology.

Besides the theoretical knowledge on the RES systems, the trainers attending the Install+RES “train for trainer” courses have been provided with practical knowledge on how to install PV, solar thermal, heat pump or biomass systems. The practical part of the Install+RES training has been named “hands on learning” approach and it represents one of the fundamental steps to be implemented in the field of training courses for installers of RES systems to guarantee quality in the RES installations.

Another key point of the Install+RES “train the trainer” courses is represented by the high quality level training material developed, by the training equipment and by the video clips produced to ensure the knowledge transfer from the trainers to the installers. The Install+RES training material is based on three categories of printed books (Information, worksheets and solutions), as shown in the figure below, which has been developed for seven languages (German, English, Polish, Italian, Slovenian, Bulgarian and Greek) and for four RES technology: PV, solar thermal, heat pump and biomass. The training material is based on about 1000 pages for each language.





The availability of high level training equipment has then guaranteed the proper implementation of the “hands on learning concept”. Some photos of the training equipment are shown below for the off-grid and on-grid PV systems.



Some video clips developed during the Install+RES project are available at Install+RES website ([www.resinstaller.eu](http://www.resinstaller.eu)):



[Home](#) [For installers](#) [For trainers](#) [Links](#) [Training Material](#) [Publications](#) [Project](#) [Events](#) [Contact](#)

Welcome to the **Install+RES** website

In this website you will find all information to become an installer of small-scale renewable energy systems (photovoltaic, solar thermal, heat pumps and biomass systems) in buildings.

Training courses for installers of small-scale renewable energy systems in buildings

Training courses for installers of small scale renewable energy systems (photovoltaic, solar thermal, heat pumps and biomass systems) in buildings are now available in [Bulgaria](#), [Greece](#), [Italy](#), [Poland](#) and [Slovenia](#). Keep checking this website for further information. Do not miss the opportunity to attend one of the Install+RES training courses and to become an installer of the most innovative and market oriented energy technologies of the future.

[Learn more on how to participate to the Install+RES courses](#)



We will now add to this basic solar energy panel

English [100%]

Wilhelm Kirchensteiner, Bildungszentrum für Solartechnik / Training Centre for Solar Technology

Intranet Login

Username

Password

Remember Me ☐

[Forgot your password?](#)

[Forgot your username?](#)

Manfred Wolf then mentioned the relevance of the European Qualification Framework (EQF) in the implementation of training courses for installers of RES in the Vocation Education and Training (VET) sector in Europe, which is characterized by different qualification schemes, different learning paths and by different terminologies and meaning. The European Qualification Framework represents a fundamental tool to create a common understanding of learning outcomes and reference point for the creation of National Qualification Frameworks (NQFs). The establishment of a EQF has also the objective of supporting the mobility of skilled RES Installers, as requested in the annex IV of the RES Directive. During the Install+RES project, a matrix of competences has been developed in order to define the qualification level of the installers to be qualified. Install+RES should meet the criteria of EQF level 5 or 6. Manfred Wolf then concluded his presentation by highlighting the ambitious target of achieving a European qualification of RES installers, which will facilitate the mobility if RES installers in Europe and at the same time ensure the quality of RES installations.

Domenico Campogrande mentioned that the Install+RES project was able to develop a toll to connect theoretical and practical knowledge, which is important for companies. Afterwards he welcomed on the stage Stathis Tselepis from CRES, the Greek National Centre for Renewable Energy Sources.

### **3.2. Best practice in the implementation of qualification scheme for small-scale RES systems**

#### ***Stathis Tselepis, Centre for Renewable Energy Sources (CRES)***

Stathis Tselepis provided the participant with a feedback on the implementation of the Install+RES training courses for installers in Greece at CRES, the Greek National Centre for Renewable Energy Sources. Three courses for installers of PV systems have been implemented at CRES: one pilot and two courses. Two workshops have been organised and articles written for National magazine on RES to advertise the Install+RES training courses at CRES. In the beginning of the Install+RES project, the Install+RES PV training material was translated, adapted and implemented in Greek and according Greek, European and International standards and experience. New training material was developed taking into account the current PV technology and commercially available PV system components according to the feedback from the participants of the pilot and 1<sup>st</sup> training course. The training equipment has also been purchased in order to implement also the practical part, the „hands on learning“ concept of the Install+RES project. Some photos from the PV laboratory at CRES are shown below. In total 42 participants were certified for attendance. The certification process is still on-going at CRES, since at present no “official” certification or equivalent qualification scheme (based on structured training and examination of the knowledge and skills acquired) exists for installers of small-scale RES systems in Greece. Stathis Tselepis concluded his presentation by mentioning that the installers and the companies welcomed with great enthusiasm the PV training courses organized by CRES.

## **4. Session III - “PVTRIN” Training of Photovoltaic Installers**

#### ***Chairperson: Theocharis Tsoutsos, Technical University of Crete (TUC), PVTRIN project coordinator***

Theocharis Tsoutsos opened the session III related to the PVTRIN project.

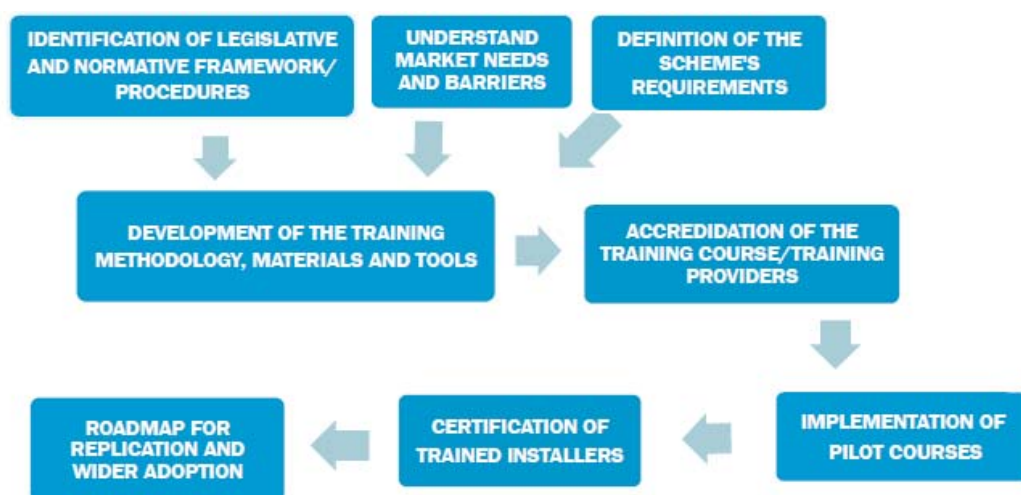
### **4.1. The PVTRIN training and certification scheme: methodology and tools**

#### ***Stavroula Tournaki, Renewable and Sustainable Energy Systems, Technical University of Crete (TUC)***

Stavroula Tournaki from the Technical University of Crete (TUC), manager of the PVTRIN project, provided the participants with a detailed overview of the PVTRIN training project, which has the aim of:

- establishing a pool of qualified technicians competent at installing PV systems according multinational quality standards;
- providing the key components for a qualification framework, an appropriate training methodology and a transparent accreditation route;
- minimizing risks or technical failures during the PV system installation and maintenance ;
- raising awareness of benefits of quality standards, advancement of skills and employing qualified workforce.

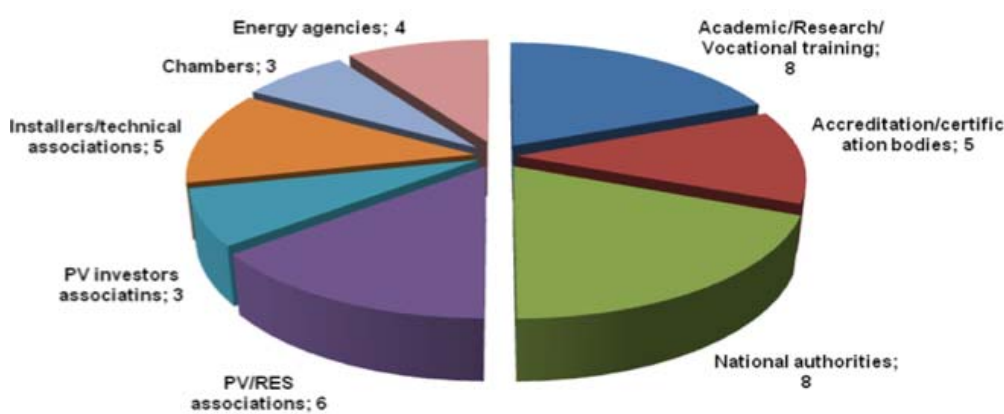
The PVTRIN scheme development action plan is shown in the figure below.



**National Consultation Committees (NCC)** have been established in each PVTRIN country, in order to incorporate the genuine market needs and to assure the key stakeholder groups' consensus ensuring thus the sustainability of the PVTRIN scheme during and after the end of the project . The role of the NCCs is to:

- transfer the market's experience
- assist to the identification of the specific needs and constraints in each country
- provide consultation for the scheme development
- promote the training and reinforce the recognition of the certification scheme
- maintain the scheme

45 organisations of key stakeholders (involving industry associations, professional unions and installers associations, vocational training organizations, accreditation bodies, chambers of commerce, consumers/investors associations, national authorities formed the PVTRIN National Consultation Committees. The synthesis of the NCCs is shown in the figure below.



The National Consultation Committees (NCC) provided a strong contribution to the PVTRIN consortium in the identification of the market needs and actively contributed to the development of the training course structure and the definition of the certification requirements.

In the frame of PVTRIN a market research was carried out to record the opinion and perceptions of the PV market actors and of the PV investors. The survey clearly shows the need for training in the PV sector in order to ensure quality in the PV installations. Some indicative findings are:

- 42% mentioned technical failures;

- 35% consider that the failures are due to malfunctions in electrical installation, technicians inexperience or improper design;
- 30% consider the technical skills of the existing PV installers, in relation to their needs, as non satisfactory, 42% just sufficient;
- 74% admit that they would be more confident if their system was installed by a certified installer; 52% are willing to pay more to have its system installed by certified staff.

The PVTRIN training has been developed taking into account:

- Criteria set by RED Directive (Article 14, Annex IV)
- National legislative framework
- Input and recommendations of the NCCs’ members, and the identified requirements of the certification scheme
- Relevant expertise and successful initiatives in EU
- The PV Installers task analysis

The PVTRIN training course structure is shown in the figure below.

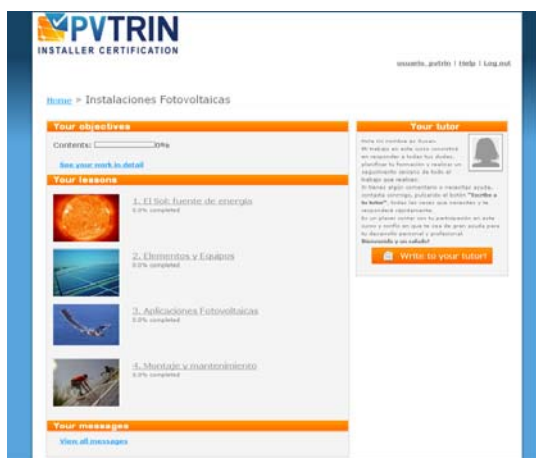
|   | MODULE  | CLASS | LAB/SITE | SELF STUDY |
|---|---|-------|----------|------------|
|   | hours   |       |          |            |
| 8 days class<br>course duration 4 weeks | 1. BASICS   | 4     |          | 6          |
|   | 2. DESIGN PRINCIPLES                                    | 9     | 3        | 24         |
|   | 3. BAPV AND BIPV  | 4     |          | 8          |
|   | 4. INSTALLATION - SITEWORK                              | 10    | 2        | 30         |
|   | 5. MAINTENANCE AND TROUBLESHOOTING                      | 3     | 2        | 8          |
|   | 6. CASE STUDIES – BEST PRACTICES                        | 3     |          | 14         |
|   | 7. EXAMPLE INSTALLATION OF A SMALL SCALE PV ON BUILDING | 4     | 7        | 12         |
|   | 8. QUALITY MANAGEMENT AND CUSTOMER CARE                 | 3     |          | 6          |
|   |   | 40    | 14       | 108        |

The training course was based on classroom lectures, lab practice (Hands-on training) and on self-study and practice through the e-learning platform. The trainees admitted to the course qualified electricians (trained on DC, licensed to practice in electrical installations of at least 10kW) and with experience whilst working for an electrical installation company or a PV installation company.

The training material and tools developed for the PVTRIN course is shown in the figure below and consists of:

- PVTRIN Handbook – Study Guide
- Checklists – Practical tips
- Troubleshooting Guide
- E-learning platform





Once the training material was developed, eight pilot training courses were implemented in six European countries: Bulgaria, Croatia, Cyprus, Greece, Romania and Spain. In total 400 applications have been received and 180 trainees have been trained. Stavroula Tournaki thanked the participants for their attention and invited them to visit the PVTRIN website for further information.

#### **4.2. *The PVTRIN training and certification of PV installers in Europe- The European Initiative for raising standards and promoting confidence***

##### ***John Holden, Building Research Establishment (BRE)***

John Holden from Building Research Establishment (BRE) provided the participants with an overview of the relevance of the certification scheme for installers of PV systems. He mentioned that the certification scheme developed within the PVTRIN project is in line with the requirements of the RES Directive 2009/28/EC and includes:

- Accredited training/certification organisations;
- Defined and published requirements;
- Refresher training.

The PVTRIN certification scheme has defined a procedure also for the maintenance of the certification, which is fundamental to ensure the quality of PV installation. This includes the monitoring of the PV installer performance by monitoring:

- Installation activity
- Attendance at refresher events
- Type and number of complaints
- Use of certification mark

John Holden highlighted that a failure to meet maintenance requirements could result in suspension or withdrawal of an installer's certificate.

Several documents have been developed within the PVTRIN project to support the training providers and certification bodies willing to implement a certification scheme according to the requirements of the RES Directive. These documents are available in the website of the PVTRIN project ([www.pvtrin.eu](http://www.pvtrin.eu)). They are:

- Guidance for assessors
- Written and Practical exam assessment forms
- Guidance for training providers and certification bodies

John Holden concluded his presentation by mentioning that the PVTRIN certification scheme is stimulating the PV market with the creation of new professions and jobs. This should be the aim of a certification scheme, which should provide supplier and clients with confidence for the PV systems, thereby creating new jobs and supporting European Member States in reaching the 20-20-20 targets.

#### **4.3. *PVTRIN Training and Certification of PV installers in Europe. Implementation of the PVTRIN scheme in EU countries: Roadmap***

##### ***Ioannis-Thomas Theologitis, European Photovoltaic Industry Association (EPIA)***

Ioannis-Thomas Theologitis from European Photovoltaic Industry Association (EPIA) provided the participants with an overview of the roadmap for the adoption and implementation of the certification scheme across Europe.



The aim of the roadmap is the replication and utilization of the PVTRIN project’s outcomes for the wide adoption of the certification scheme by as many EU member states as possible. These was done by developing of guidelines, instructions and plans to follow based on PVTRIN training and certification scheme and according to the different market needs across EU Member States.

Five types of markets have been identified: mature PV market, developed market, developing market, basic market and new market, .

characterised by different needs and development phase. In the mature PV markets, certification schemes and training courses for PV installers already exist, therefore the certification scheme and training course offered within the PVTRIN project have to be integrated in the existing infrastructures. In the new PV markets nothing exists, therefore the first step is to support the stakeholders with the definition of the “PV installer” profession. The market needs have been identified with the involvement of all relevant stakeholders, such as:

- Concerted Action for RES (CA-RES), Ministries (e.g. Energy, Industry, Employment) National Research Centres and Energy Institutes
- Accreditation - Certification bodies
- Training providers authorised to offer continuous vocational training to technicians
- Trade organization and professional networks (e.g. electricity and PV associations)
- Universities and National Experts

Ioannis-Thomas Theologitis concluded his presentation by mentioning the next steps to be done to ensure the further dissemination of the PVTRIN certification scheme and promoting the PVTRIN training package through:

- relevant national stakeholders in target countries (e.g. national associations)
- targeted media and relevant associations’ communication channels ( and
- in national and international events, industry summits and WGs organized by EPIA
- online webinar(s) to brief on PVTRIN certification future studies related to market and industry needs (e.g. PV observatory)

#### **4.4. PVTRIN Training and Certification of PV installers in Europe. The European Initiative for raising standards and promoting confidence**

##### ***Camelia Rata, Agency of Brasov for the Management of Energy and Environment (ABMEE)***

Camelia Rata from the Agency of Brasov for the Management of Energy and Environment (ABMEE) provided the participants with an overview of the Romanian experience in the implementation of the PVTRIN training and certification scheme. In the beginning of the PVTRIN project, an analysis of the PV field in Romania has been carried out, which focused on:

- Legal framework
- Applicable technical regulations
- Regulating authorities
- Available training courses in the field of PV
- Available trainers and training structures in the field of PV
- Current status of the training framework in Romania

In order to carry out the analysis, a National Consultation Committee (NCC) has been set up according to the PVTRIN methodology, which included:

- Ministry of Regional Development and Tourism

- National Regulatory Authority for Energy
- National Qualification Authority
- Romanian Standards Association
- „Transilvania” University - Braşov
- „Ion Mincu” University of Architecture and Urbanism - Bucharest
- „Valahia” University - Târgovişte
- „URBAN-INCERC” Institute - Bucharest
- Employers Association for New Energy Sources

Camelia Rata described the situation in the beginning of the project in Romania, where only the qualification title “Solar photovoltaic systems installer” existed, but with no clear definition of the knowledge and skills set required to perform this profession. No professional standard defined for PV installers existed. Other key issues in the Romanian situation were:

- Lack of PV related training for vocational training of adults
- Lack of training providers/trainers for PV courses
- Lack of legal regulations and financial instruments to support the promotion of the PV technology
- Lack of confidence in the growth potential of this technology
- Widespread belief that a new qualification is not necessary

Once identified the above mentioned issues, ABMEE became a training provider in accordance to the Romanian law and delivered an acknowledged training course, based on the PVTRIN methodology and requirements.

ABMEE obtained an authorization from the National Qualification Authority (Member of the National Consultation Committee, NCC, established in the beginning of the PVTRIN project) on the documentation defined through PVTRIN. During the next 4 years ABMEE remains authorized to provide training for PV installers following the PVTRIN training scheme. The authorization is in line with the national legal frame (Law no. 57 of 22/03/2012 for adults training) and is issued by Ministry of Labor, Family and Social Protection and Ministry of Education, Research and Innovation. The PVTRIN material has been verified by a technical committee and the trainees have been selected. The PVTRIN training courses were then implemented.

Camelia Rata concluded the presentation by mentioning the achievement reached by ABMEE during the PVTRIN project:

- A provider for vocational training authorized following the PVTRIN methodology and in accordance with the Romanian legal frame
- Direct involvement of the private sector
- 45 trained installers
- High interest for this PV specialization – 61 trainees for future courses
- Contribution to the development of the Professional Standard in Romania for PV installers based on the PVTRIN methodology and using the experience gained in the project
- Several training providers willing to include the PV training in their training offer

Theocharis Tsoutsos thanked all speakers of the PVTRIN session and invited the participants to arise questions. Stathis Tselepis from CRES asked if a feedback from the participations of the training courses has already been collected and about the background of the trainees. Stavroula Tournaki informed that three types of questionnaires have been developed to collect feedback: one together the suggestions of the NCCs’ members, 2<sup>nd</sup> for the installers attended the PVTRIN course and a 3<sup>rd</sup> for the PVTRIN trainers. Thus, comments and suggestions from the key stakeholders, the trainees and the trainers were collected and used to improve the training courses content and the training materials.

The PVTRIN training course addresses to qualified electricians. The entry requirements for the applicants include to have received training on DC systems, to hold license to practice in electrical installations of at least 10kW and to have gained relevant experience working for a PV installation company, electrical installation company or a roofing company.

. Evelyn Schellenkes from AIE asked if the training courses were integrated in the school systems. Camelia Rata answered that the courses were not integrated in the school system because the target was the installers, but now a new Vocational Education Training (VET) has been developed in order take into account also in the VET the training courses for the installation of PV systems.

## 5. Session IV - Towards a qualified workforce for RES installations in Europe

### 5.1. Panel discussion I: Why a need for certification of installers?

**Moderator: John Holden, Building Research Establishment (BRE)**

**Panelists: Kristof Van Roy (fwb-fcc Constructiv), Claire Roumet (Cecodhas Housing Europe) and Maarten De Groote (Flemish Energy Agency).**

John Holden opened the 1<sup>st</sup> panel discussion by raising the following question to the panellists: “Why is the certification of installers important?”

Maarten De Groote mentioned that the final goal is to guarantee quality in the installations and how to encourage companies in investing in quality. There could be a connection with financial incentives. An obligatory certification will not be the solution.

The insurance companies could ask for the certification in order to “valueise” the quality concept. In this sense an important role could be played by insurance companies, which could raise the awareness of the customer to quality issues.

If the financial incentives for RES will decrease, there will be a big pressure on costs for the companies, which have to find the financing to invest in training in a market that will become more and more competitive. The market needs proper qualified professionals, not necessarily certified.

Claire Roumet highlighted that the cosumer does not really look for certification, but for quality, no matter by which means, certification could be one of these tools to reach quality amongst others. There should not be a link between certification and insurance, because this will encourage consumers to select installers identified by their insurance companies.

Kristof Van Roy mentioned that the added value of the certification scheme is related to the fact that it obliged the installers to be trained, but certification is not the only solution.

There was much participation from the audience including the following comments:

- Certification would have more value if maintenance of installed systems was included
- Some installers are concerned about the cost of certification and the time away from work needed to be trained
  - Certification should be considered by companies as an investment
- Mortgage companies could insist that PV systems are installed only by certificated installers.

- Consumers want ‘professionals’ to complete their work and guaranteed results
  - Some installers can cut corners
  - Consumers/customers need to be aware of certification schemes
  - Consumer information needed which should be widely circulated.

In conclusion of the 1<sup>st</sup> panel discussion it has been highlighted that in order to promote the certification of PV installers information about the benefits of using certificated installers should be made available to consumers/customers, the list of certified installers should be public available, insurance companies could provide incentives for PV installations completed by a certified installer and mortgage companies could require that only certificated installers install PV systems on mortgaged buildings.

## **5.2. Panel discussion II: Training and qualification needs for RES installers – The market’s perspective**

**Moderator: Sonja van Renssen, journalist**

**Panelists: Pedro Dias, European Solar Thermal Federation (ESTIF), Willi Ernst (CentroSolar), Charalampos Konstantopoulos (Panhellenic Federation of Electrical Contractors (POSEI)), Jérôme Kervyn de Merendrée (Sunswitch).**

Sonja van Renssen opened the 2nd panel discussion by asking the panellists how useful are initiatives and certificates for the market, can they be adapted?

Charalampos Konstantopoulos mentioned that certified installers are needed; we should not let uncertified contractors working on the market. Public financial support is needed. It is anyhow important to decide at national level, which kind of renewable we want to support.

Willi Ernst mentioned that the training starting 25 years ago based on exchange of experience. At present, the increase in competition has generated a decrease of quality in the PV installation. The complexity of the market requires well trained installers.

Pedro Dias mentioned that the qualification of installers is crucial in this period characterised by large amount of small installations. Cost is also crucial. Due to the increase of market complexity, the PV companies are now providing simple systems to be installed. There is still a big gap in the field of large installations, which needs to be covered by installers highly qualified.

Jérôme Kervyn de Merendrée mentioned that the possibility for training is different from small to large companies. There are different needs from region to region and from country to country.

Several issues have been discussed during the 2<sup>nd</sup> panel discussion. It was mentioned that, it will be complicated to ask that only certified installers can stay on the market. It is better to insist on better and more training.

There is an obligation for the European Member States to put in force certification schemes. The certification scheme should take into account the specificities of each country.

It is fundamental to focus on quality and performance of the installations and ensure their maintenance and operation. Monitoring of installations should be a “must”, it is also relatively easy to put in force. A third party should collect complaints related to the installations and give a “penalty” to the installers not reacting

on time. Basic training is needed and it should be completed by targeted training for designers and installers of systems. More and more companies have developed their own software for system designing, which can be provided to the installers. It should not be necessary to provide two kinds of certificates, one for designer and one for installers, but surely two different kind of training and qualification is needed. In the training the part related to safety of workers should also be taken into account.

In the conclusion of the 2<sup>nd</sup> panel discussion it was mentioned that the customer does not have to care about the quality of security of the system, this has to be done by a third party.

## **6. Conclusion and adjourn**

**Theocharis Tsoutsos, Technical University of Crete (TUC), PVTRIN project coordinator**

**Ingrid Weiss, WIP – Renewable Energies (WIP), Install+RES project coordinator**

Theocharis Tsoutsos underlined the need for similar actions in EU Member States due to the lack of qualified & certified technicians, the inadequate motivations from employers to ask for qualified technicians, the well funded investments and bad installations, but also due to the EU opportunities financed by BUILDUP Skills. He noted that due to IEE2 now exist success stories (Trained and qualified technicians according to RED, Certification schemes in 6 EU Member States, Strong interest from other EU Member States to adopt the schemes, active participation of the Professional associations in the development of the schemes). At the end he expressed some critical issues for the success of relevant actions such as the definition between qualification vs certification, the future sustainability of the projects, the cross-countries mobility in EU of qualified technicians and questions to be solved such as the dilemma between obligatory and voluntary schemes.

Closing the workshop, Theocharis Tsoutsos and Ingrid Weiss thanked the participants, speakers and moderators for their contribution and closed the Install+RES & PVTRIN event.

## List of participants

| First Name  | Last Name           | Organisation   |
|-------------|---------------------|--|
| Marcelo     | Alves Queiroz       | Independent professional   |
| Le Gac      | Anouck              | Federation Francaise Du Batiment   |
| Sofia       | Arancon             | WIP - Renewable Energies   |
| Franz       | Assbichler          | Vocational School for Electricians and Electronics Installers - City of Munich |
| Carmen      | Avellaner de Santos | Independent professional   |
| Andro       | Bacan               | Energy Institute Hrvoje Pozar  |
| Gelu        | Calacean            | European Commission- DG EMPL   |
| Domenico    | Campogrande         | FIEC (European Construction Industry Federation)                               |
| Silvia      | Caneva              | WIP - Renewable Energies   |
| Anthi       | Charalambous        | Cyprus Scientific and Technical Chamber  |
| Simon       | Ciawwelli           | CECODHAS   |
| Pieter-Jan  | Cluyse              | European Heat Pump Association (EHPA)  |
| Panagiotis  | Coroyiannakis       | CPMR Brussels Office   |
| Dan         | Cristescu           | FGS Familia  |
| Carla       | Cox                 | European Association of Electrical Contractors (AIE)                           |
| Maarten     | De Groote           | Flemish Energy Agency  |
| Guillaume   | Declève             | RBF/PVQual   |
| Anita       | Derjanecz           | REHVA  |
| Vincent     | Detemmerman         | Construction Confederation   |
| Pedro       | Dias                | European Solar Thermal Federation (ESTIF)                                      |
| Jose        | Donoso              | Unión Española Fotovoltaica (UNEF)   |
| Maurizio    | Esitini             | Assistal   |
| Willi       | Ernst               | Centrosolar  |
| Radu        | Gaspar              | Agency of Brasov for the Management of Energy and Environment                  |
| Wolfgang    | Gurnhofer           | SDA - SolarDoktor Austria  |
| Georgios    | Halambalakis        | Centre for Renewable Energy Sources (CRES)                                     |
| Thomas      | Hensel              | Vocational School for Electricians and Electronics Installers - City of Munich |
| John        | Holden              | Building Research Establishment- BRE Global                                    |
| Bernard     | Huberlant           | 3E   |
| Ana         | Huidobro            | TECNALIA   |
| Mo          | Kelly               | SASIE LTD  |
| Jérôme      | Kervyn de Merendrée | SunSwitch  |
| Alik        | Kriekouki           | EACI   |
| Charalampos | Konstantopoulos     | Panhellenic Federation of Electrical Contractors (POSEI)                       |
| Hugues      | Latteur             | QUEST FOR QUALITY  |

### List of participants (continued)

| First Name     | Last Name   | Organisation   |
|----------------|-------------|--|
| Charalampos    | Litos       | Technical Chamber of Greece  |
| Uros           | Lukic       | School centre Velenje  |
| Andrew         | Machirant   | Svensk Solenergi   |
| Janusz         | Magiera     | Cracow University of Technology  |
| Nikola         | Matijasevic | Energy Institute Hrvoje Pozar  |
| Steve          | Moul        | HOR  |
| Iglika         | Nedelcheva  | VHSE "John Atanasov"   |
| Yuriy          | Nemish      | Cracow University of Technology  |
| Miran          | Papez       | School Centre Velenje  |
| Steve          | Pester      | Building Research Establishment  |
| Stanislaw      | Pietruszko  | Polish Society for Photovoltaics   |
| Camelia        | Rata        | Agency of Brasov for the Management of Energy and Environment (ABMEE)        |
| Claire         | Roumet      | Cecodhas Housing Europe  |
| Elizarya       | Ruskova     | VHSE "John Atanasov"   |
| Evelyne        | Schellekens | European Association of Electrical Contractors (AIE)                         |
| Pavel          | Sevela      | REHVA  |
| Ioannis-Thomas | Theologitis | European Photovoltaic Industry Association (EPIA)                            |
| Gianluca       | Tondi       | Executive Agency for Competitiveness and Innovation (EACI)                   |
| Stavroula      | Tournaki    | Technical University Of Crete (TUC)  |
| Stathis        | Tselepis    | Centre for Renewable Energy Sources (CRES)                                   |
| Theocharis     | Tsoutsos    | Technical University of Crete (TUC)  |
| Sohnja         | Vanrensenn  | Journalist   |
| Kristof        | Van Roy     | fvb-ffc Constructiv  |
| Scarlett       | Varga       | European Photovoltaic Industry Association (EPIA)                            |
| Ingrid         | Weiss       | WIP - Renewable Energies   |
| Manfred        | Wolf        | Academy for Teacher In-Service Training and Staff Development -ALP Dillingen |