Education and Culture DG
Lifelong Learning Programme
LEONARDO DA VINCI

GECO

Green Economy and Competence of Organizations

A project by local social partners for support

at the corporate strategies for the management and recognition of jobs and training needs

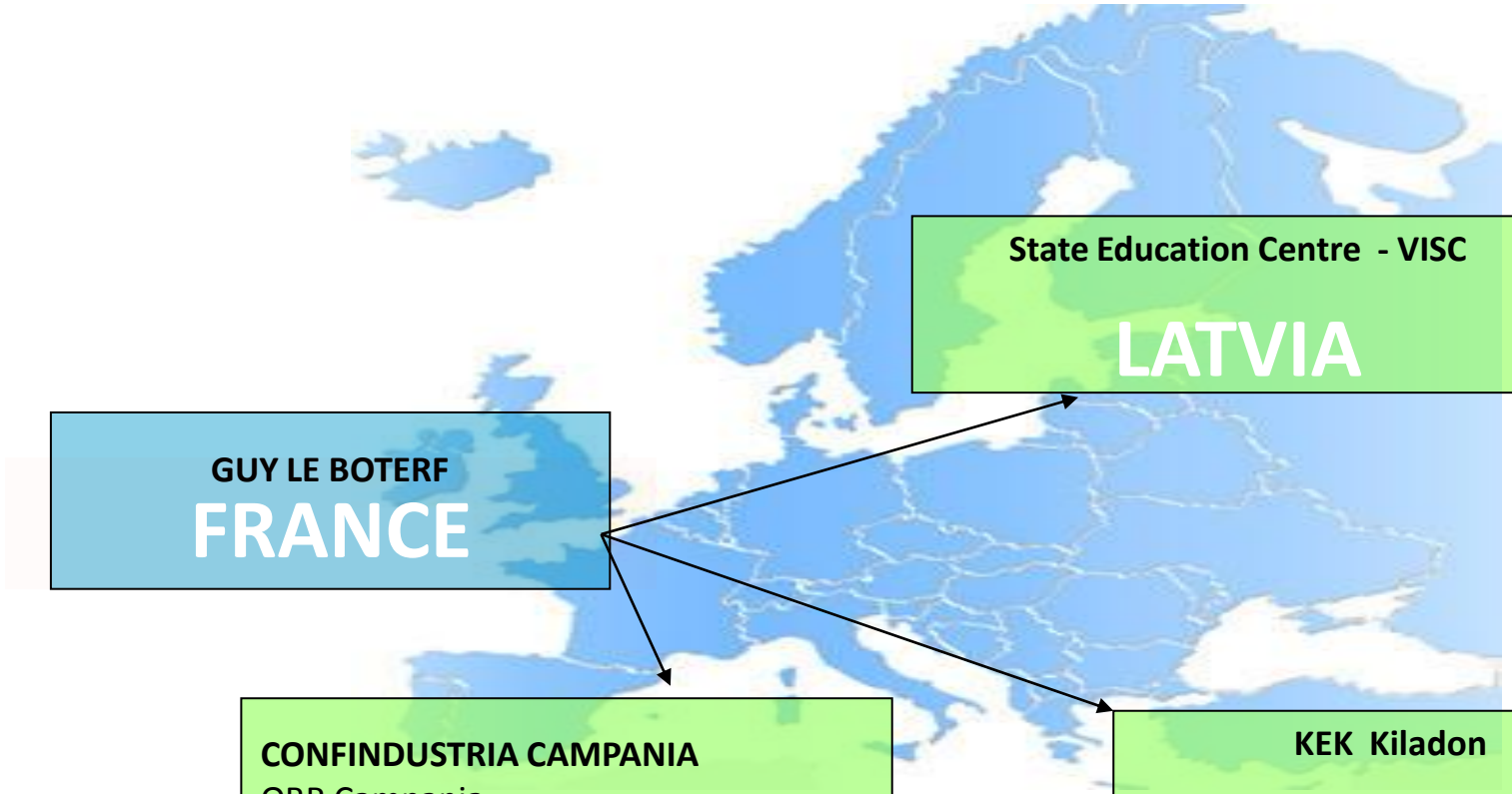
in the fields of renewable energy and energy saving

10 October 2013

Brusselles Conference

“Skill needs in greening economies”

Geography



State Education Centre - VISC

LATVIA

GUY LE BOTERF

FRANCE

CONFINDUSTRIA CAMPANIA
OBR Campania
CGIL Campania
CISL Campania
UIL Campania
Confindustria Puglia
CEPAS
Speha-Fresia Coop

ITALIA

KEK Kiladon

GREECE

Scenario

2009: The economic crisis is felt with its bite. Many companies suffer because of the difficulties of the market, but companies (especially SME's operating in RES sectors - Renewable Energy and Energy saving) have many and new opportunities.

In the same time, RES companies have difficulties with facing new rules and unknown professional and organisational problems:

They must comply with the European Directive (DIR 2009/28/CE) on training and certification of professionals in RES sectors. But the national legislation in Italy and other Countries have not yet incorporated this normative.

Many RES small systems installation companies and many workers have problems for qualification or requalification . They have to adapt to rapid evolutions of market, technologies, policies (incentives). ..

A response by the social partners

A support for training strategies, management of professional profiles, and skills recognition in the SMEs is necessary.

This awareness derives from the monitoring of Training Plans financed by Fondimpresa (the eldest interporfessional fund for continuing training in Italy and Campania established by Confindustria, CGIL, CISL, UIL).

A response by the social partners

Confindustria, CGIL, CISL, UIL promoted and designed GECO project with technical support of the Regional Bilateral Organism for the Continuing Vocational Training in Campania (**OBR Campania –** Fondimpresa Regional Articulation designated as Coordinator Partner).

A qualified transnational partnership is built around this project

Confindustria Campania is the Applicant Partner.

The European Lifelong Learning Program - Leonardo da Vinci - funds GECO project in **2010**.

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A response by the social partners

GECO implemented a Transfer of Methological Innovation:
The Guy Le Boterf Model "HOW TO ACT AND INTERACT WITH COMPETENCE IN A GIVEN PROFESSIONAL SITUATION" has been transferred into SMEs of RES.

This model is based on **Professional Situations** and **Professional Practice**, it is appropriate because

MANY GREEN JOBS ARE NOT BASED ON REGULARY STUDY, THEY ARE BASED MAINLY ON REACTIVITY OF PEOPLE AND COMPANIES TO TECHNOLOGY AND MARKET EVOLUTIONS, ON PERSONAL EXPERIENCE , ON AUTO-LEARNING PROCESS, ON CORPORATE CONTINUING TRAINING.

Numbers

26 months - duration: October 2010 – November , 2012	
€ **388.713,51** Total cost	**€291.535,13** L dV CE Programm Grant
4 European Countries	Italian Regions **3**

10 partners	**1** Regional Bilateral Organisme IT
	2 Confindustria Regional federations IT
	3 Trade-Union Regional federations IT
	1 Governemental Agency for VET System LV
	1 Local Development and Training Organism GR
	1 Private Certification body - ISO /IEC 17024
	1 Monitoring Project and Self-Evaluation Partner

14 Companies	**11** Small Enterprises
	1 Medium enterprise
	2 Large enterprises
556 Peoples	**118** Workers - EQF 3-4
	111 Specialised Workers - EQF 4-5
	31 Technicinas- EQF 5-6
	14 Managers
	262 Teachers and trainers
	20 Social Partners Operators

4 Transnational Conferences
6 Partners Workshops
9 Local events
1.000 Books IT – FR – EN
1.000 CD IT – FR – EN
1 WEB Site IT – FR – EN

10 Company diagnostic on professional profiles and training needs with Matrix for Management of the Corporate Training
6 Referential Descriptors of Job Profiles in Green Economy Sectors Corporate Continuing Training Plans
1 evaluation standard based on a Professional situation of the PV installers
1 Panel of the Green Professional Profiles identified by the GECO Project
1 Module Green Skills in a Vocational Education System
2 Proposals for Job Profiles Regional Standard (RES operator - RES Technician)

Outputs

Referential Descriptors of RES jobs:

- PV Systems Intaller,
- RES support-operator,
- RES designer, Installation
- RES project manager,
- Anemometric Service manager,
- Manager for the production of anemometers stations
- Coordinator of wind farms

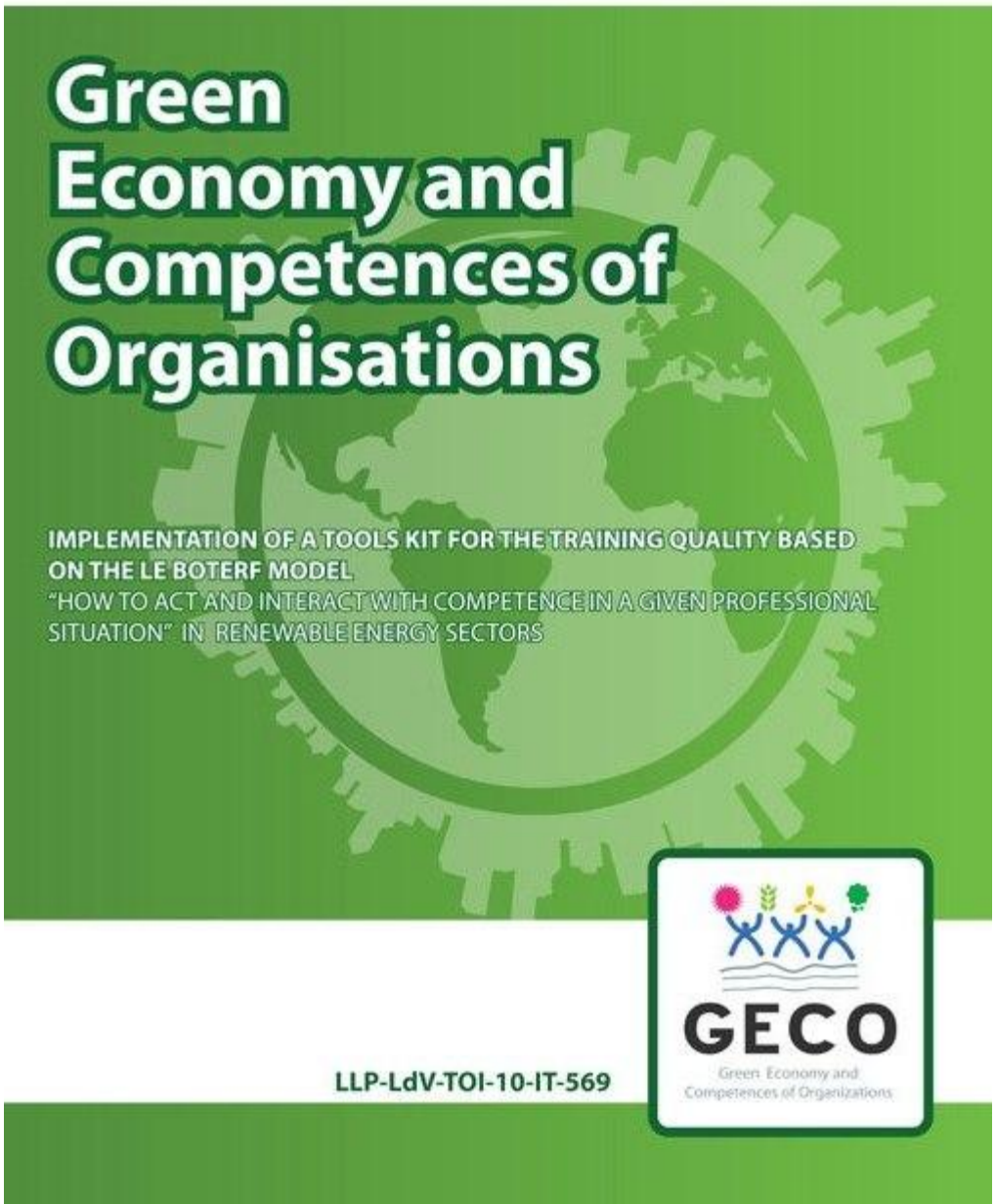
- Matrix for management of competences and training in the RES SMEs.
- A model for recognition and certification of competences and professions, based on Professional situation and Professional Practice.
- a Module Green Skills for the identification of contents in VET design for every profession and every professional activity (green thinging and transversal green skills).
- Other contribution to ECVET systems.

Website

www.ldv-geco.eu

Book + CD

- IT
- FR
- EN



The Level of Professional Descriptors

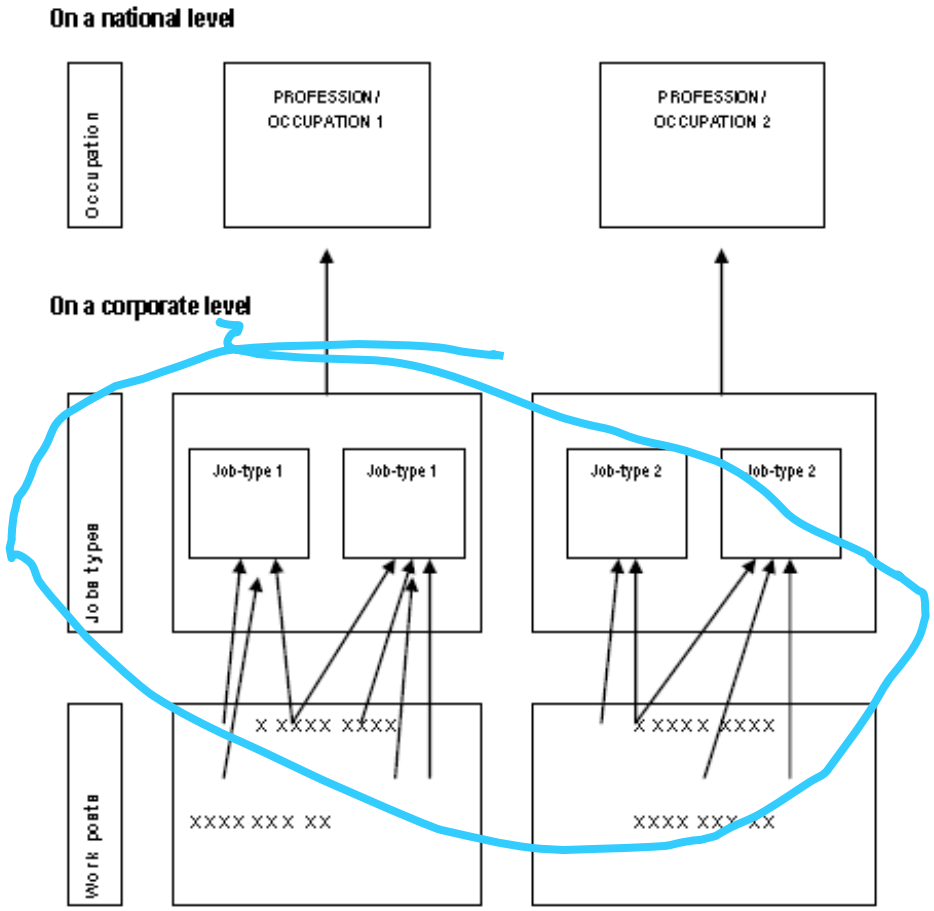


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Fig. 2.4

Area / Languages	COMPANIES	COMPANIES BY TYPE (sector + size)	NAZIONAL (Definition sources)
French	POSTES DE TRAVAIL (G. Le Boterf)	PROFILS TYPES (G. Le Boterf)	MÉTIERS/PROFESSIONS (G. Le Boterf)
English / American English	WORK POSTS	JOBS	OCCUPATIONS (ISCO - 08) (Paid employment jobs /self-employment jobs) (O.NET)
Italiano	POSTI DI LAVORO	PROFILI PROFESSIONALI-TIPO	PROFESSIONI U.P.Unità professionali (ISTAT/ISFOL – NUP 06)

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Fig. 2.3

Job Descriptors based on Professional Situations

The Le Boterf model distinguishes between “being skilled” and “having skills”. This distinction has been used in the GECO project.

The main components of a Professional Situation are the following:

- a given activity to be carried out
- a set of desirable performance criteria for this activity
- some “expected outcomes " (products, services) for the final addressees.
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Guy Le Boterf *: « Ingénierie et évaluation des compétences », Les Editions d’Organisation, 1998, 6ªedizione, 2010 e « Construire les compétences individuelles et collectives », LesEditions d’Organisation, 2000, 5ªedizione 2010*

Correspondences

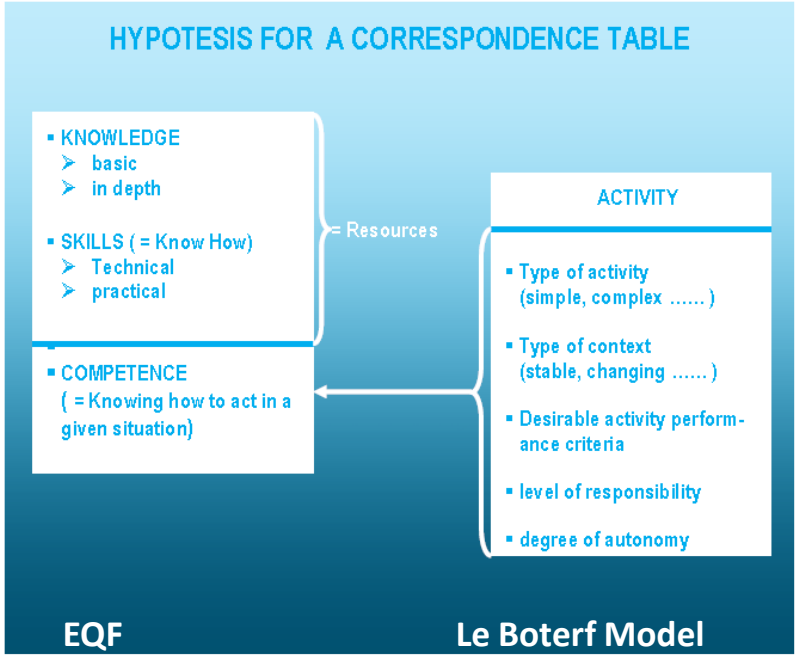

 Fig. 2.1

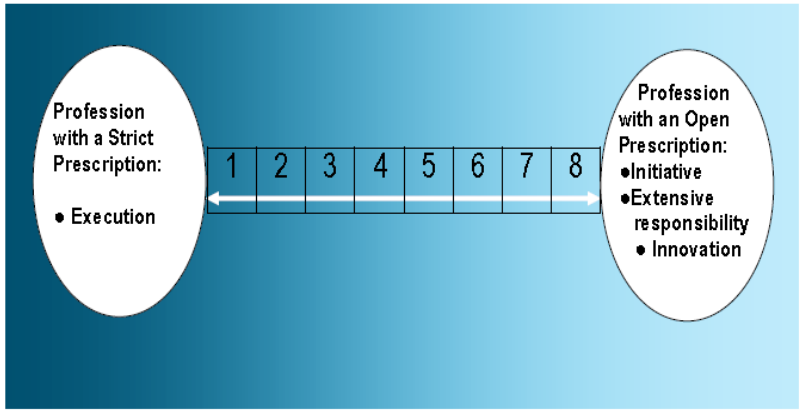

 Fig. 2.2

The model for the competence reference description used in this case study is based on the methodology developed by Guy Le Boterf: ©Le Boterf Conseil and has been modified by the LdV GECO project.

Created on the 20/10/2011: - Revision of the 03/07/2012 n 7

Responsability : GECO partner

Name of Job Profile	**PHOTOVOLTAIC SYSTEM INSTALLER.**
Mission	**To fit photovoltaic panels in compliance with a technical project, European directives and the current technical regulations.**
Corporate background	**SME (small medium enterprise) in the photovoltaic sector for installations up to 20 kwp**
Entry title or qualification	**Electrical-electronic-mechatronic technician's qualification or the like.**
Responsabilitty and Autonomy EQF level	**4**

PROFESSIONAL SITUATIONS (PS) :

1) **TRANSPORTING PV SYSTEM COMPONENTS AND EQUIPMENT TO THE INSTALLATION SITE.**
2) **INSTALLING THE PHOTOVOLTAIC ARRAY.**
3) **CARRYING OUT ROUTINE AND EMERGENCY MAINTENANCE ON PHOTOVOLTAIC ARRAY.**

SP 3	**CARRY OUT ROUTINE AND EMERGENCY MAINTENANCE WORK ON THE PHOTOVOLTAIC SYSTEM.**
Type of activities	**PRODUCTION: PROVIDING BACK UP SERVICES**
Responsibility	**Implementing routine and emergency system maintenance procedures in accordance with the directives of the Technical Manager and the job orders.**
Operational context	**Residential buildings and factory roofs and their outbuildings, canopies, shelters and conservatories and generally speaking structures in rural and industrial areas which are not protected by urban restraints.**
Expected outcomes	**The photovoltaic system works uninterruptedly during its life cycle.**
Desirable activity performance criteria	
Procedural criteria :	- **by arranging for a sight and instrumental inspection, cleaning operations and the routine replacement of worn out parts for a photovoltaic installation on the basis of the maintenance plan, the job order and the technical documentation/manuals for the photovoltaic installation.** - **by verifying and ensuring the stability of the support structures underlying the solar panels and the installation in general, and making sure that the electrical circuit protective de-**

Descriptors based on Professional Situations

Whilst experimenting with the Le Boterf model, the GECO project made a distinction between: :

- «The main personal resources (knowledge, know-how or skills, aptitudes…….). needed to operate efficiently in a professional situation and which must be learnt by the professional.

- external or back up resources available to the professional and which he should be able and be in a position to use »

The personal resources (or know-how) are classified as follows:

- basic

- technical and instrumental,

-social,

-linguistic (second language),

- Related to ICT

- Related to management /direct responsibility functions

PERSONAL RESOURCES	CORRESPONDENCE TABLE PR/PS	PS1	PS2	PS3
Basic knowledge *With reference to the Educational system and to the 8 EU key Competences.*	- Basic knowledge associated with the Electrical/electronic/mechatronic Technician's Qualification or equivalent professional qualification.	X	X	X
Scientific, methodological and technical knowledge *(In-depth and specific)*	- Identifying, naming and using the equipment and materials for a PV installation.		X	
	- Inspection methods for quality, efficiency and safety of the products and the job.		X	
	- Methods for scheduling and organising on-site activities.		X	
Technical and instrumental skills *(Being capable of...)*	- Implementing suitable safety and see with the level of risk whilst setting up ing out operations at a height.		X	X
	- Mounting PV modules with screws a them on the underlying structure fo instructions and ensuring that the re observed.		X	X
	- Switching the PV system on and gettir	X		
	- Wiring the PV panels up to the D.C. ele to the electrical grid.		X	X
	- Fitting in the delivery report and the daily w		X	X
	- Inspecting and replacing or repa bles, fuses or any other parts.		X	X
	- Checking what state the photov c making sure they are clean.		X	X
	- Positioning materials so that the inside the vehicle during transpo avoid any damage to the PV mod following the manufacturer's inst		X	X
	- Reading and interpreting the layout tion and distinguishing between th tual situation with a view to pinpoin any problems.		X	X
Professional Contexte and related Regulations Knowledge	- L a			
	- B a			
	- T a			
	- In field.		X	
	- Professional code and trade regulations and Professional certification.		X	
	- National, international and European legislation (CE|CENELEC,IEC) *	X	X	X
Social skills *(Being capable of.....)*	- Establish a good relationship with the customer choosing the most appropriate, competent site and clear/effective and communicative approach, adapting/modulating the tone of voice when explaining the work activities, the procedures and any unforeseen/critical issues		X	X
	- Motivating and assigning responsibility to the test staff by either briefing them or debriefing them in order to optimise the work schedule.		X	X
	- Play an active role in the briefing sessions with other professionals and company managers or executives.	X		
	- Promoting the sale of a photovoltaic system to a potential customer in the worksite by choosing the most appropriate communicative style in the circumstances.		X	X
	- Verbally suggesting project amendments to the draftsman understanding by and coherently in words.	X	X	
	- Communicate efficiently and from the distant installation site with the use of a mobile phone and a tablet with the technical manager and the draftsman with a view to analysing a problem and solving an emergency.		X	X
ICT skills *(Being capable of...)*	- Using the main functions of an Excel sheet *	X	X	X
	- Writing up work reports and delivery reports with a word processing software programme. *	X	X	X
	- Presenting work data or information by using a presentation programme. *	X	X	X
	- Accessing and navigating on Internet with a mobile phone or a tablet.	X	X	X
Language skills (second language) *(Being capable of...)*	- Using English to an A2 level when consulting manuals and catalogues.	X	X	X
KNOWLEDGE BACK UP RESOURCES	Accessory and component catalogues for systems to be installed.	X	X	X
	Specialised Internet sites.	X	X	X
	Forums and distance learning courses on the installation and maintenance of photovoltaic systems.	X	X	X

Information sheet attached to the GECO Reference model. Created on the 03/07/2012 - by GECO partners	
Name of the Job Profile	**PHOTOVOLTAIC SYSTEM INSTALLER.**
References	**EUROPEAN QUALIFICATIONS FRAMEWORK: Level 4**
	Nation reference: IT NUP ISTAT:
	6.2.4.1 - Installatori e riparatori di apparati elettrici ed elettromeccanici
	6.2.4.5 - Installatori di linee elettriche, riparatori e cavisti
	6.1.3.6.2-Installatori di imp
	References ISCO 08:
	7412 Electrical mechanics
	7413 Electrical line installe
	7411 Building and related
	7412 Electrical mechanics
Corporate background	**SME (small and medium e**

Sector of economy	**Nation reference: IT ATECO ISTAT**	
	33.20.01 Installazione di motori, generatori e trasformatori elettrici; di apparecchiature per la distribuzione e il controllo dell'elettricità (esclusa l'installazione all'interno degli edifici)	
	35.11.00 Produzione di energia elettrica - gestione di impianti di produzione di energia elettrica di qualsiasi origine: termica, nucleare, idroelettrica, da turbine a gas, diesel e fonti rinnovabili	
	43.21.01 Installazione di impianti elettrici in edifici o in altre opere di costruzione (inclusa manutenzione e riparazione)	
Entry qualification or certification	**Technical studies Qualification: specialisation in electrical-electronic mechantronic subjects.**	**ISCED: 3A/3B - 52/54**
	Electrical-mechanic or electronic VET qualification.	**ISCED: 3C - 52/54**

OUTCOMES

The evaluation process for certification of professionals competences based on professional situation and professional experience.

A certification experimentation based on structurate reflexion and analisys of professional practices and on the performance criteria applied by the professionals.

Certifying professional competence

In the GECO project with CEPAS and KEK, we analysed tests and examinations for certification of PV installers. An excerpt of the referencial of evaluation is presented below; it refers only to the skills and methodology that are placed between the resources associated to the professional situation and the performance criteria.

This application is an extension of the experimentation from corporates level to sectorial level .

Certifying professional competence

FOR MOST ADULTS AND PROFESSIONALS , THE RETURN AND REPRESENTATION OF THEIR KNOWLEDGE DEPENDS MAINLY ON THE ACTIVATION OF THEIR OWN PROFESSIONAL PRACTICE AND EXPERIENCE

Certifying professional competence

In the GECO project with CEPAS and KEK, we analysed tests and examinations for certification of PV installers.

1) In a trial involving 75 candidates, many installers (~60%), without certification but experts and well established, have difficulties with the written test of ISO / IEC 17024 procedure adopted by CEPAS. In the examination procedure, the percentage of importance of the two tests is 75% for the written exam and 25% for the practical test (on a base of 100) and in any case, the exam is positive only if the candidate obtains a vote of 70/100 or more.
2) Some applicants, who had a low score in the tests for the certification, were asked to describe and identify or simulate the **key activities** and the **factors** that bring to the final good installation able to satisfy the customer.
3) In commenting and describing simulated situations, problems of a technical nature or diagnosis of specific cases, they could provide very precise answers. They were detailed and accurate also when they referred to regulations and theoretical concepts, thus filling the gap emerged in the written tests.

The evaluation scheme

Assessment of achievement criteria in the performance:	
Procedural Criteria:	**CARRYING OUT ROUTINE AND EMERGENCY MAINTENANCE ON PHOTOVOLTAIC ARRAY** - *by arranging for a sight and instrumental inspection, cleaning operations and the routine replacement of worn out parts for a photovoltaic installation on the basis of the maintenance plan, the job order and the technical documentation/manuals for the photovoltaic installation.* - *by verifying and ensuring the stability of the support structures underlying the solar panels and the installation in general, and making sure that the electrical circuit protective devices are in a good state and all clean.* - *by pinpointing and removing any causes leading to malfunction (shade, water, animals) whenever possible or when necessary asking the technical manager for the specific back-up of a professional specialist.* - *by carrying out a sight inspection and instrumental working tests making sure that each system part is intact and working and whenever necessary, replacing any damaged parts and restoring free contact.* - *by pinpointing any accidental damage and breakdown of the photovoltaic panels and other elements, the causes thereof (lightening, hail, overheating, accidental impact or manufacturing defects) with a view to replacement procedures.* - *by gathering energy generation data from the display or the data-logger and comparing it with any instrumental data that might have been gathered.* - *by filling in and keeping up to date the registers and operational reports for the PV system, its performance and the maintenance operations.*

The evaluation scheme based on professional practice

Expected results					*Photovoltaic system kept in perfect efficiency or repaired in the best way*				
				Assessment of achievement criteria in the performance:					
Criteria for how to proceed:	*TO DO ORDINARY AND EXTRAORDINARY REPAIRS FOR THE PHOTOVOLTAIC SYSTEMS* 1. *by following the routine procedures for the ordinary control* 2. *by finding possible risks, failures and their causes* 3. *by scheduling times and way for an extraordinary intervention* 4. *by making possible repairs and components substitutions*								
Means for assessment:	*OBSERVATION of the Criteria Implementation in real or simulated Professional Situation*								
Assessment Indicators or Evaluation Parameters	1. *for detecting damages or tampering of the PV modules and their metal supports, the candidate does a visual inspection of PV modules and of their metal supports, so integrated with the cleaning operations*								+/-
	2. *for checking of the state of electrical contacts and of the switchboard of the electrical material, the candidate performs a visual inspection of: all connections, cables integrity and the isolation of the masses, grounded and surge arresters; so integrated with the cleaning and repair operations*								+/
	3. *for verifying the electrical efficiency of the PV system, the candidate preliminary checks the : closure of fuses and breakers, the ON state of the main switch and all switches, the power light on, the values of voltage (from display) related to weather that correspond to those planned, the values of the measuring instruments are consistent. When necessary he does the string test*								+/
	4. *for verifying the electrical efficiency of the PV system the candidate load and he compares the data of electricity meters: meter of electricity production; meter of electricity taken and transferred to the electricity distribution network; meters of Electrical Conversion Substation/interface board/inverter. If the system have a data-logger*								+/-

The evaluation scheme

OBSERVATION of the Criteria Implementation/description in real or simulated Professional Situation					
1. for detecting damages or tampering of the PV modules and their metal supports, the candidate does a visual inspection of PV modules and of their metal supports, so integrated with the cleaning operations					+/-
2. for checking of the state of electrical contacts and of the switchboard of the electrical material, the candidate performs a visual inspection of: all connections, cables integrity and the isolation of the masses, grounded and surge arresters; so integrated with the cleaning and repair operations					+/

Impact

Social Partners in Campania use the lessons and products of the GECO project to promote and stimulate:

- the corporate continuing training based on professional skills and professional practice reflexion;
-the diffusion of process for competences recognition linked to training in the green economy and other promising sectors;
- the sharing of experiences to support European process in VET system, recognition and competences transferability of the professionals.

Impact

Geco project contributes to the definition of devices to encouraging competences certification by applicants in the Fondimpresa calls for training in the RES and other promising sectors.

Fondimpresa

4,5 millions of workers and 160 thousand companies adhere to Fondimpresa.

Fondimpresa financed continuing training for more than 1 million workers

SCENARIO CHANGE

Thanks