



**EUROPEAN COMMISSION**  
Employment, Social Affairs and Inclusion DG

Europe 2020: Employment Policies  
New Skills for New Jobs, Adaptation to Change, CSR, EGF

## **GSSkills – Geothermal and Solar Skills**

**VP/2012/009/0065**

### **Report WP5: 2<sup>st</sup> International workshop**

**WP LEADER: DEBEGESA**

**DURATION: 2 DAYS**

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Date: 24<sup>th</sup> February February 2015

Place: Chania – Greece

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## 1.1 INTRODUCTION

*The main aim of the 2<sup>nd</sup> GSSkills workshop was to draft useful conclusions among experts participating in the workshop that can evaluate the work of the partners for GSSkills project and present to the key stakeholders of the Chania region the main conclusions of the survey reports, case studies collection and also the main outcome of the workshop. This was achieved with the participation in the workshop of experts in geothermal and solar systems, regional stakeholders and the project partners.*

*The second international workshop was held between the 23rd and 25th of February of 2015, as part of the GSSkills - Geothermal and Solar Skills project. The expected result of the project is the creation of a sectorial network, the Project Network. This will be formally incorporated and will be the official owner of the skills catalogue developed under this grant. In the long run the project will help to facilitate an intensive cooperation within the plumbers and electricians professional sector in the EU. The project Network will be incorporated and will be named the official proprietor of the skills catalogue. It will license Network members to offer this catalogue nationally. Although initially limited to three countries, it will be our goal once the grant is over to expand the network to include additional partners and countries.*

*2<sup>st</sup> International Workshop of GSSkills programme was implemented in Chania, Greece where 17 experts; 12 from Greece, 3 from Spain, and two from France participated. The structure of the workshop was designed as following:*

### **1<sup>st</sup> DAY: 23/02/2015**

*Two groups of experts were created: geothermal and solar. They worked on the base of a list of key questions that were defined by the partners in January 2015 according to the conclusions of the survey and case studies collection. The partners agreed on the questionnaire for the workshops and the topics of discussion in order to get some valuable conclusions after the workshops and so to use this info for other reports and documents made by the partners during the project.*

A. Concrete objectives

- a. *To prioritise the necessary skills through which to respond effectively to the solar and geothermal installations.*
- b. *To share results of the case studies.*
- c. *Contribute to the final version of the projects key outcomes (Skills Catalogue and Successful Stories book).*

2<sup>nd</sup> DAY: 24/02/2015

*In this workshop there was a brief introduction to the project GSSkills, making a picture in each country of the current situation of skills mismatching in the solar and geothermal sector. After that, by a discussion it was decided the skills needed and the lacks in the labour force. Finally, applied solutions were explained by the private sector and the education/training system: case studies of companies.*

A. Concrete objectives

- a. *Increase the awareness of the stakeholders about the problems identified and the possible solutions.*
- b. *Find out about the experience of the stakeholders in first person.*
- c. *Exchange information about the field of geothermal and solar skills.*
- d. *Find out about threats, weaknesses, strengths and opportunities*
- e. *Transferring knowledge by developing a training material*

B. Schedule of the Workshop

**1st Session.** *Encounter with the stakeholders (public authorities, training centres, university, business association and trade unions). A meeting to discuss policy measures and common strategies involving all key stakeholders.*

*a. Technical University of Crete (TUC)*



TECHNICAL UNIVERSITY OF CRETE (TUC)  
SCHOOL OF ENVIRONMENTAL ENGINEERING  
RENEWABLE AND SUSTAINABLE ENERGY  
SYSTEMS LABORATORY

*The Renewable and Sustainable Energy Systems Laboratory (ReSEL), is part of the Environmental Engineering Department, of -Technical University of Crete. It covers a wide range of knowledge subjects in the fields of Applied Research and Technology Development for RES (Renewable Energy Systems) and RUE (Rational Use of Energy), Energy Planning and Sustainable Energy Management.*

*Over the last few years ReSEL has developed research and project activities with an emphasis on critical insular issues.*

*More specifically, ReSEL expertise focuses on Sustainable Energy Systems-Policy and Planning, RES Technologies and Integration, Biomass-Biofuels, Sustainable Building. ReSEL's main objective is to turn research and scientific knowledge to mature energy solutions and practices that are economically and technically sound.*

*RES Equipment for training and demonstration*

- ✓ *Autonomous educational system, with PV (40W) and wind generator (60W)*
- ✓ *Small demonstration PV/fuel cell unit*
- ✓ *Solar vehicle, under scale*
- ✓ *Exhibition showroom with demo RES applications*

**2nd Session.** *Meeting with the companies that have a direct encounter with the installers and developers of these technologies.*

**b. MAZANAKIS company**



*The company has been founded in 2000, in Chania Crete. It is specializing in the fields of heating and plumbing.*

*The company is member of technical branches diathermy network, the largest network of its kind in Greece comprised of over 60 member companies, so to win big competitive advantage in products, prices and technical support.*

*During the last years the company has followed the market trends and placed strategically in the field of Renewable Energy Sources (RES), thus expanding the area of products and services provided that it can meet the needs of more and more complex construction projects.*

*Today the company offers commercial, design and construction department, specializing in heating applications, air conditioning, power, water treatment, photovoltaic and solar thermal systems and is a leader in the local market especially in renewable systems (solar, geothermal, biomass) and energy savings.*

**c. CRETACON company**



*The CRETACON company founded in 1968 in Chania, is mainly involved in the building construction sector. Today, Cretacon is operating in the provision of services, marketing and installation of equipment for projects that utilize renewable energy sources (RES).*

*Cretacon, as a construction company, is specialising in constructing an “ultra low-energy house”, using active solar and passive solar building design techniques and components to reduce their energy expenditure. At the same time, it uses RES for energy efficiency.*

*Typically, they use high levels of insulation, such as external thermal insulation systems to prevent heat loss through linear thermal bridging, water and thermal insulation of roofs and basements and energy efficient windows, in order to lower heating and cooling energy. Solar thermal systems also provide hot water for domestic use but also to contribute to the house's heating. Lighting and miscellaneous energy use is alleviated with fluorescent lighting and energy efficient appliances. This type of house fully meets the requirements of new Regulation for Buildings' Energy Efficiency.*

*Further to the above Cretacon as a Green Energy company, is specializing in renewable energy projects (RES), and namely that of Solar thermal, photovoltaic, geothermal and wind energy installations.*

**Time: 7:00pm**

**Plenary conference:**

- *Brief introduction to the project GSSkills*
- *Making a picture in each country of the current situation of skills mismatching in the solar and geothermal sector. Skills needed Vs Lacks in the labour force (including the results of the survey)*
- *Solutions applied by the private sector (case studies) and the education/training system: case studies of companies*

## 1.2 MATERIALS AND METHODS

*Based on the preliminary analysis through the GSSkills research implemented in WP, which was used for the 1<sup>st</sup> workshop held in Eibar, experts have been determined and invited in the workshop. After that, representatives from educational institutions, public authorities, companies and business community from Greece, France and Spain, were invited to take part in the workshop. Finally, 17 experts took part in the 2<sup>nd</sup> International Workshop.*

*The workshop was to evaluate prior outputs of the project and namely that existing training provisions in the field of photovoltaic and geothermal systems installations and of Skills needed by ply,bers and electricians and have to be added in existing training programmes.*

*The workshop was held in Chamber of Commerce of Chania premises in Crete. Participants were presentations of existing practices followed by both companies and training providers, as well a presentation of vocational training system in each partner country, together with indicative tables of existing training programmes and curricula (see ANNEX 1-6), two rooms for round tables and discussions implementation, computers and the supporting materials like papers, labels, etc.*



## 1.3 RESULTS

### GEOTHERMAL QUESTIONS:

**A. QUESTION:** *Are the existing training opportunities and training provisions adequate to fill the skills' gap of low skilled workers in Solar-thermal, Photovoltaic and Geothermal field?*

Countries	Answer	Common points	Differences
Greece	Experts answered that there is a significant gap between the skills needed in geothermal installations, and especially in drilling skills and competences. Plumbers can follow private courses that are mainly given by private companies connected to suppliers of geothermal installations' parts.	Gap in knowledge and in the skills needed.	
Spain	<p>Necessary skills that complement existing training resources:</p> <p>Although geothermal energy is not addressed specifically and comprehensively is necessary to emphasize that some of the competencies (skills) required are available through other training modules.</p> <p>Plumbing: Heat facilities, air conditioning and refrigeration systems, thermal installations and fluids.</p> <ul style="list-style-type: none"> <li>- Needs of thermal load, learned in the training required to obtain necessary governmental approvals for titles Installer</li> <li>- Knowledge of maintenance and execution of heating</li> </ul>		



	<ul style="list-style-type: none"> <li>- Knowledge of maintenance and implementation of systems of cold.</li> <li>- Read hydro schemes</li> <li>- Electricians. Electronics, electrical.</li> <li>- Notions of electricity (pumps and electrical connections in their own heat pumps and thermostats).</li> <li>- Reading circuits and / or electronic.</li> </ul> <p>It also highlights that there are gaps in knowledge that are not covered by the current line, for example the following are highlighted:</p> <ul style="list-style-type: none"> <li>- Operation and comprehensive sizing geothermal facilities.</li> <li>- Pump returns geothermal and labor regulations...</li> <li>- Materials and yields for geothermal installations.</li> </ul> <p>We do not talk and commercial and technical industry, Studies of Architecture, Engineering, Construction, knowledge when considering this type of facility.</p>		
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**B. QUESTION:** *Are these training provisions part of or lead to a specific certification?*

Countries	Answer	Common points	Differences
Greece	There is not any special certification scheme yet for geothermal installers. It is a strong need, as all buildings have to meet “near zero energy” requirement in the next five years.	Lack of special or professional certification in these training.	In Spain some of the knowledge of geothermal energy can be acquired



Spain	<p>There is no formal training or professional certification attesting specifically to professionals running geothermal facilities. While in Spain just the specific qualifications Thermal Systems Installer.</p> <p>Nevertheless, as stated in the previous section, some of the knowledge of geothermal energy can be acquired through other formations.</p> <p>In this sense, the engineers or professionals in the HVAC (both) sector would be more specific training that can have the knowledge necessary for the development of such facilities.</p> <p>Extending this aspect, when raising a Geothermal Installation should be assessed several sections:</p> <ol style="list-style-type: none"> <li>1. The design itself and / or calculation of Geothermal Installation, based on primarily by heat or refrigeration requirements (if any) of the building in question. Installation location, type of heating used (under floor heating, radiators, fan coil. Etc.).</li> <li>2. Election of heat pump and system or scheme to rise at the facility.</li> <li>3. Needs Geothermal Deposits and method of capture.</li> <li>4. Knowledge of the Geothermal Heat Pump, all its possibilities and regulations with the data indicated by the mark.</li> </ol> <p>That said, it should be differentiated according to the R.I.T.E. (Regulation of Thermal Installations in buildings) and Spanish Technical Building Code, masters</p>		through other formations.
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	<p>based on European legislation, those lower or higher than 70 kW of thermal generation facilities.</p> <p>Of less than 70 kW should be based on a study based on a technical report and the higher will be based on a draft necessarily be made by an engineer and shall be endorsed by the College of Engineering itself.</p> <p>In both cases the technical aspects of the installation in question, and the various materials used in construction are specified.</p> <p>Another thing is the subsequent maintenance of the facilities. Both for regulations to be made in the system to maintain the heat pump it.</p> <p>In the first case, you should be familiar with the thermal system of the building.</p> <p>An example: In the case of under floor heating and since above the heating pipes is a layer of mortar. This needs to dry. Is estimated at almost one year the time for that to happen. Specific regulation for drying with what regulations should be modified pump in periods of three months to achieve optimal performance is required.</p> <p>In the second case, knowledge of refrigeration facilities is needed, besides power by the thorough knowledge of the pump itself and / or the system. Knowledge of gases... We recall that the legislation requires specific qualifications for it.</p> <p>For maintenance, there must be parallel with the specific Governmental</p>		
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	Authorization for it.		
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**C. QUESTION:** Which are the main difficulties or obstacles in accessing current training opportunities and provisions, both theoretical and practical, in these fields?

Countries	Answer	Common points	Differences
Greece	<p>The main difficulty is that there is not any curriculum provided and a corresponding training scheme addressed to technicians that want to work in the field. There are courses and seminars not interconnected that a technician has to select himself hoping that he will get the whole package of knowledge needed.</p> <p>Competences cannot be acquired anywhere.</p> <p>Another obstacle is the geographical distance and timing, as training seminars are spread out around Greece, given at different time periods for one to attend the whole training package.</p>	Absence of specific formal training and competences cannot be acquired anywhere.	In Greece are courses and seminars are not interconnected.
Spain	<p>Obviously, and as explained in the previous section the main difficulty is the absence of specific formal training for geothermal systems. While this lack of training is compatible with the necessary knowledge discussed above.</p> <p>The added training therefore should be based on two fronts: the first with the training that should give the manufacturers or distributors of own brands and the second (the practice) we see no other option than learning on a company dedicated thereto.</p> <p>The difficulty is that these companies may be reluctant since it is not taste overly</p>		

	form as may be creating parallel competition.		
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**D. QUESTION:** *Can you describe a possible methodology for identifying new skills/ knowledge needed to follow technology changes in your region?*

Countries	Answer	Common points	Differences
Greece	<p>A possible methodology could be the creation of a local/ regional alliance including all interested parts and stakeholders. This alliance could include suppliers of geothermal parts for installations, technicians, vocational training providers (CVET and University specialized laboratories. In addition, the participation of a regional authority, having the power of planning regional training strategy, would be necessary.</p> <p>Machining of new skills needed with existing skills, could be made by a digital platform, where all relevant data could be uploaded. The platform can be updated with new technological evolvments of the sector and respective knowledge and skills needed in pre-specified time intervals.</p> <p>Additionally, this platform could targeting to all other professions, connected to the “green market” in construction sector.</p>	Generate stable links and strategic alliances with suppliers, vocational training providers and public agencies.	
Spain	<p>Obviously, and as explained in the previous section the main difficulty is the absence of specific formal training for geothermal systems. While this lack of training is compatible with the necessary knowledge discussed above.</p> <p>The added training therefore should be based on two fronts: the first with the training that should give the manufacturers or distributors of own brands and the</p>		



	<p>second (the practice) we see no other option than learning or a company dedicated thereto.</p> <p>The difficulty is that these companies may be reluctant since it is not taste overly form as may be creating parallel competition.</p>		
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**E. QUESTION:** *If it was a regional network/ board to be created, for identifying skills/ knowledge and existing training provisions mismatch, which in your opinion could be an effective mix of members for? (i.e. private association of companies, regional authorities, chambers, labour association, training institutes, etc.)*

Countries	Answer	Common points	Differences
Greece	As already referred in previous question, most appropriate and effective regional network should include all the relevant public bodies, as chambers and regional authorities, the local universities and training institutes, the relevant technicians associations and finally a few representatives of local enterprises. All the previous members should compose a regional board (sector alliance) for knowledge/skills formalization and update.	<p>The related agents that should be member are the next ones:</p> <ul style="list-style-type: none"> <li>• Vocational schools</li> <li>• Research institutes</li> <li>• Public Bodies</li> <li>• Companies</li> </ul>	
Spain	<p>1. I do not know if a regional network is "enough" when creating training about resources. We say this in that the formations regulated and their degrees are larger geographically than one region.</p> <p>2. Another thing is that within the formal training when titling Installer obtain and / or various "degrees" of self-regulated studies can expand the materials with the aim to train students enough.</p> <p>Setting an example: there are degrees of studies facilities of "heat" and in</p>		



	<p>parallel exist "cold" but both are independent.</p> <p>If you got enlarge or unify the core subjects, the "regional" red believe that in our case is very efficient.</p> <p>We have public companies needs analysis in addition to technologies and Regional Development Societies (based on knowledge of the needs of the region itself) and technical schools with proven and sufficient resources to address the training capacity.</p> <p>There should be and also has the support of Biotech Firms that can extend such training skills more specifically.</p>		
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### SOLAR QUESTIONS:

**A. QUESTION:** *Are the existing training opportunities and training provisions adequate to fill the skills' gap of low skilled workers in Solar-thermal, Photovoltaic and Geothermal field?*

Countries	Answer	Common points	Differences
Greece	Experts answered that there isn't a significant gap between the skills needed both in solar thermal and photovoltaic installations, and the current training courses, although there are some essential issues, as new technological trends that should be added.		
Spain	In the environment of the CAPV are several schools offering courses capacitive these matters, so if you define a good training offer, It offers courses open offer to		





	<p>accessed without training requirements. Courses Level 2 (Intermediate level vocational training) and 3 (High level vocational training) (For Ex. ENAE0108 INSTALLATION AND MAINTENANCE OF SOLAR PHOTOVOLTAIC SYSTEMS) certifiable require certain minimum entry requirements, but are salvageable justifying minimum knowledge by examining entrance. The cycle Degree ENERGY EFFICIENCY AND THERMAL ENERGY includes the certificate itself has ENAE0208 and entry requirements consistent with the VET system regulated. However, it should be specified in the quality of the training and the actual capacity of teachers, trainers often have no experience in systems.</p>		
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**B. QUESTION:** *Are these training provisions part of or lead to a specific certification?*

Countries	Answer	Common points	Differences
Greece	Experts answered that in Greece there is a specific certification for “specialist in solar-thermal energy installations”, as well as “specialist in photovoltaic solar energy installations”.	Both of them have specific certification for each training field.	
Spain	<p>Skills are part of the training, although in the training section there is a division of suitable materials do not think clearly pierced professionals, confusing the market, clearly it is found in this workshop where the line of thermal power generation and is not sufficiently defined.</p> <p>The existing certifications in this field are:</p> <ul style="list-style-type: none"> <li>• ENAE0108 INSTALLATION AND MAINTENANCE OF SOLAR PHOTOVOLTAIC</li> </ul>		



	SYSTEMS <ul style="list-style-type: none"> <li>• ENAE0208 INSTALLATION AND MAINTENANCE OF SOLAR THERMAL POWER PLANTS.</li> </ul>		
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**C. QUESTION:** Which are the main difficulties or obstacles in accessing current training opportunities and provisions, both theoretical and practical, in these fields?

Countries	Answer	Common points	Differences
Greece	Experts answered that the main obstacles are inadequate promotion, complicated legislation, and lack of synergy actions in existing training opportunities and provisions.	Complicate legislation	In Spain the minimum level required for access is also a difficulty.
Spain	The minimum level required for access, according to the explanation in the above two points.		

**D. QUESTION:** Can you describe a possible methodology for identifying new skills/ knowledge needed to follow technology changes in your region?

Countries	Answer	Common points	Differences
Greece	Experts answered that local enterprises and specific universities' laboratories that work with relevant technical issues and applications are the main sources that could provide new skills and knowledge needs. So, the collaboration of the previous sectors with a specific regional board will formalize a final skills/ knowledge identification procedure.	The providers of the new skills and knowledge need should be regional network where local enterprises and specific universities' laboratories	
Spain	Currently it is difficult to define this answer because the development of		



	<p>Renewable Energies in the Spanish state is really complicated due to legislation and administrative obstacles. In an environment free channel is likely to frame them, it developed until now, have been closed, equipment manufacturing, engineering, installers... the goal of distributed generation is seen maintaining Europe today is very complicated application the State.</p> <p>The regional network should be based on project work with area businesses - technology watch - feedback from trainees and tutors corresponding - surveys related agents.</p>	participates.	
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**E. QUESTION:** *If it was a regional network/ board to be created, for identifying skills/ knowledge and existing training provisions mismatch, which in your opinion could be an effective mix of members for? (i.e. private association of companies, regional authorities, chambers, labour association, training institutes, etc.)*

Countries	Answer	Common points	Differences
Greece	Experts answered that the most appropriate and effective regional network should include all the relevant public bodies, as chambers and regional authorities, the local universities and training institutes, the relevant technicians associations and finally a few representatives of local enterprises. All the previous members should compose a regional board for knowledge/skills formalization and update.	<p>The related agents that should be member are the next ones:</p> <ul style="list-style-type: none"> <li>• Vocational schools</li> <li>• Research institutes</li> <li>• Public Bodies</li> </ul>	
Spain	There is a need in the field of renewable energies specialization,. In this way both the training centers as specific professional associations, administration, enterprises should be in the debate.		



	<p>The challenge focuses on managing the network so that prime the general interest and not the interest particular. Therefore it is an issue that should be considered previously to be the network (membership functions and objectives of the network).</p> <p>Also it should be noted that the photovoltaic and solar thermal systems only share the solar motion (the electrician us not installed heating system in our home, or the plumber repairing electrical panels), therefore, networks and groups should consider starting this specification. Related entities solar thermal have more in common with geothermal energy with solar PV.</p> <p>The Related Agents are the next ones: Companies, research institutes, development agencies and vocational schools.</p>	<ul style="list-style-type: none"> <li>• Companies</li> </ul>	
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## 1.4 ANNEXES

*Any detailed information, such as sample questionnaires, which is not essential for the reader to understand the outcomes or conclusions of a report, but which can provide them with a more complete understanding of how the information was collected or analysed should be included as an appendix.*

Annexes 1: Education system Greece

Annexes 2: Education system France

Annexes 3: Education system Spain

Annexes 4: Presentation result Good practices and case studies Greece

Annexes 5: Presentation result Good practices and case studies Spain

Annexes 6: Presentation result Good practices and case studies France

Annexes 7: Attendance list workshop

Annexes 8: Photos