

## **GEO-EDUCATION FOR A SUSTAINABLE GEOHERMAL HEATING AND COOLING MARKET**

**Project: IEE/07/581/S12.499061**

### **Sixth COURSE: TRAINING THE DESIGNERS**

**Venue:  
Universidad Politécnica de Valencia  
Valencia, Spain  
5-7 July 2010**

#### **Aim of the course:**

The Geotrainet project is supported by the European Commission's IEE programme ("Altener"), to establish a European training framework for GSHP designers and drillers. The long term aims of the project include the raising of standards in this growing industry with a view to protecting the environment and ensuring a high quality of installation for customers. Further information may be found at [www.geotrainet.eu](http://www.geotrainet.eu).

This training course will be of interest to those who have existing experience of the design of ground source heating and cooling (GSHC) systems and who wish to reinforce and further develop their professional competence in this field. The course will focus primarily on closed loop GSHC systems. Special emphasis will be made on questions related to implementation of these systems in the particular climate, hydrogeological and legal framework conditions of Spain.

Attendees will be provided with a complete set of presentations made during the course for future reference during their careers. This course will be part of an ongoing process towards the creation of a European Certification Framework for shallow geothermal installers, and raising and coordinating national and European standards in GSHP systems.

## PROGRAMME FOR DESIGNERS (1)

Programme - 5 July 2010	
09:00	<b>Registration</b>
	<b>Section A: Fundamentals and Constraints</b>
09:15	Course introduction: about Geotrainet in the frame of european shallow ground source heat pump development – <i>Isabel Fernández</i>
09.30	Overview of Shallow Geothermal Energy Systems - <i>BurkhardSanner</i>
10.00	Limiting conditions – <i>OlofAndersson</i>
11.00	--- COFFEE BREAK ---
11.30	The Spanish Geological and Hydrogeological Framework for Ground Source Heat Pumps(in Spanish)– <i>Fernando Pardo</i>
12.00	The Spanish Regulatory Framework for Ground Source Heat Pumps, Economic and Policy Constraints(in Spanish)– <i>Javier Urchueguía</i>
	<b>Section B: Feasibility</b>
12.30	Concept and Feasibility Study - <i>BurkhardSanner</i>
13.30	--- LUNCH ---
16.00	Site Investigation and Thermal Response Tests – <i>David Banks</i>
	<b>Section C: Introduction to Design</b>
16.40	Design Fundamentals - <i>Göran Hellström</i>
17.00	--- COFFEE BREAK ---
17.30	Design Fundamentals - <i>GöranHellström</i>
18.00	The Borehole Heat Exchanger: Typology, Installation and Hydraulics – <i>OlofAndersson</i>
19.00	End of session

## PROGRAMME FOR DESIGNERS (2)

Programme - 6July 2010	
	<b>Section D: Practical and Industry Perspective</b>
09.00	Installation Quality Control: Grouting, Flow and Pressure Testing, Commissioning, System Control, Monitoring and Maintenance – <i>Walter Eugster</i>
10.15	The Spanish Ground Source Heat Pump Industry (in Spanish) – <i>Iñigo Ruiz</i>
10:45	--- COFFEE BREAK ---
11.15	Drilling Borehole Heat Exchangers in Spain (in Spanish)– <i>Iñigo Arrizabalaga</i>
	<b>Section E: System Alternatives</b>
11.45	System Alternatives - <i>Göran Hellström</i>
	<b>Section G: Integration with the Building</b>
12.45	Heat Pump Technology (in Spanish)– <i>Salvador Quilis</i>
13.15	Heating and Cooling Loads (in Spanish)– <i>Teresa Magraner</i>
13.45	--- LUNCH ---
	<b>Section H: Closed Loop System Design</b>
16.00	Detailed Design, Design Criteria and Ground Loop Sizing - <i>Göran Hellström</i>
	<b>Section I: Practical computer aided design sessions</b>
16.50	Practical Session 1
17.50	--- COFFEE BREAK ---
18.20	Practical Session 2
19.00	End of session

## PROGRAMME FOR DESIGNERS (3)

Programme - 7July 2010	
	<b>Section F: Technical Tour</b>
09:00	Visit to a GSHP installation, location to be decided – <i>Teresa Magraner</i>
13.00	Course summary and end of session (in Spanish)– <i>Javier Urchueguía</i>
13.15	--- LUNCH at UPV---
15.00	End of course

### PRELIMINARY LIST OF TEACHERS

Title	Name	Affiliation
Dr.	Burkhard Sanner	EGEC, Brussels, Belgium UBeG GbR, Wetzlar, Germany
Mr.	David Banks	Newcastle University, UK Director, Holymoore Consultancy Ltd., UK
Dr.	Olof Andersson	SWECO Environment AB, Sweden
Dr.	Walter J Eugster	Polydynamics Engineering Zurich, Switzerland
Dr.	Göran Hellström	Lund University, Sweden
Dr.	Javier Urchueguía	Universidad Politécnica de Valencia, Valencia, Spain
Ms.	Teresa Magraner	EnergesisIngeniería, Valencia, Spain
Dr.	Fernando Pardo	CEDEX, Madrid, Spain
Ms.	IñigoArrizabalaga	TELUR, País Vasco, Spain
Ms.	Iñigo Ruiz	BEST Energy Solutions, País Vasco, Spain
Ms.	Salvador Quilis	EnergesisIngeniería, Valencia, Spain
Dr.	Isabel Fernandez Fuentes	Geotrained Coordinator EFG Office Director