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Programme 3<sup>rd</sup> Course:  
Training the trainers

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

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

### **THIRD COURSE: TRAINING THE TRAINERS**

**Venue:**

**GWE-Group  
Moorbeerenweg 1  
D-31228 Peine, Germany  
17-19 March 2010**

**organized by EGEC**



**in co-operation with**

**Austrian Institute of Technology, Vienna**



**and the Division of Shallow Geothermal Energy (SONG) of GtV-BV**



**GEOTHERMISCHE VEREINIGUNG E.V.  
BUNDESVERBAND GEOTHERMIE**



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## PROGRAMME SYNOPSIS

	Designer	Driller
Wednesday, 17.3.2010		
09:00 - 10:45	Section A: Introduction (common)	
11:00 - 12:30	Section B: The Building Side	Section B: Basic Drilling
13:30 - 15:30	Section C: Materials (common)	
16:00 - 18:00	Section D: Regulations (common)	
19:30 - 21:00	Roundtable: Education and Certification for GSHP in Germany	
Thursday, 18.3.2010		
08:00 - 10:00	Section E: GSHP Design - underground (common)	
10:30 - 12:30	Section F: GSHP System alternatives	Section F: BHE installation
14:00 - 18:00	Section G: Practical Demo (common)	
Friday, 19.3.2010		
08:00 - 10:00	Section H: GSHP Design	Section H: Well installation
10:30 - 12:00	Section I: GSHP Design	Section I: Specific problems
13:00 - 14:30	Course conclusion (common)	

### 17 March 2010, 19:30 – 21:00 Common

Roundtable:

#### **Education and Certification Schemes for GSHP Drillers in Germany**

A presentation of existing and developing schemes is planned, with discussion to evaluate their merits and to define their compatibility with the Geotrainet goals in the light of a pan-European scheme.

## PROGRAMME FOR DESIGNERS (1)

Programme - 17 March 2010		
09:00	<b>Section A: Introduction (2h)</b>	<b>Common</b>
09:00	Course explanation and overview	<i>Jörg Uhde</i>
09:20	Overview Shallow Geothermal Systems / GSHP	<i>Burkhard Sanner</i>
10:00	Environmental Aspects of GSHP – Drilling and Operation	NN
10:45	--- COFFEE BREAK ---	
11:00	<b>Section B: The Building Side (1,5h)</b>	<b>Designers</b>
11:00	Understanding building heating and cooling loads - what data do GSHP designers need to know from the building?	NN / Dirk Bohne ?
11:45	Understanding heat pumps	<i>Egbert Tippelt</i>
12:30	--- LUNCH ---	
13:30	<b>Section C: Materials (2h)</b>	<b>Common</b>
13:30	Plastics for pipes, manifolds, etc.	<i>Hubert Graf</i>
14:30	Materials for drilling mud and grouting	<i>Peter Mielenz</i>
15:30	--- COFFEE BREAK ---	
16:00	<b>Section D: Regulations (2h)</b>	<b>Common</b>
16:00	European legal framework	<i>Burkhard Sanner</i>
16:15	Legislative background and licensing in Germany Sources for information (brochures, online)	<i>Erich Mands</i>
16:45	Examples of licensing procedures in Sweden, Spain, etc. Sources for information (brochures, online)	NN
17:15	Standards and guidelines – European and national	<i>Burkhard Sanner (David Norbury)</i>
17:40	Certification and education schemes	<i>Stefan Stumpf</i>
18:00	End of day 1	

## PROGRAMME FOR DESIGNERS (2)

Programme - 18 March 2010		
08:00	<b>Section E: GSHP Design - Underground (2h)</b>	<b>Common</b>
08:00	Basics on geology – what engineers and drillers need to know	<i>Burkhard Sanner</i>
09:00	Determination of underground thermal conductivity	<i>Abraham/Richter</i>
10:00	--- COFFEE BREAK ---	
10:30	<b>Section F: GSHP system alternatives (2h)</b>	<b>Designers</b>
10:30	Small systems (residential)	<i>NN</i>
11:30	Large systems (heating and cooling), incl. hybrid systems	<i>Olof Andersson</i>
12:30	--- LUNCH ---	
14:00	<b>Section G: Practical Demo (4h)</b>	<b>Common</b>
14:00	Visit to drill rig manufacturing shop	<i>Prakla/GWE</i>
	Visit to drill mud laboratory	<i>GWE</i>
	Demonstration of TRT equipment	<i>Richter</i>
	Other visits as appropriate (pumps etc.)	
18:00	End of day 2	

## PROGRAMME FOR DESIGNERS (3)

Programme - 19 March 2010		
08:00	<b>Section H: GSHP Design (2h)</b>	<b>Designers</b>
08:00	Design principles for BHE	<i>NN</i>
08:30	Design of BHE for small installations	<i>NN</i>
09:15	BHE design software	<i>Göran Hellström</i>
10:00	--- COFFEE BREAK ---	
10:30	<b>Section I: GSHP Design ctd. (2h)</b>	<b>Designers</b>
10:30	Demonstration of EED software	<i>Burkhard Sanner</i>
11:15	Design of wells for GSHP and ATES	<i>Olof Andersson</i>
12:00	--- LUNCH ---	
13:00	<b>Course Conclusion</b>	<b>Common</b>
13:00	Final discussion and course evaluation	<i>all</i>
14:30	End of day 3	

## PROGRAMME FOR DRILLERS (1)

Programme - 17 March 2010		
09:00	<b>Section A: Introduction (2h)</b>	<b>Common</b>
09.00	Course explanation and overview	<i>Jörg Uhde</i>
09:20	Overview Shallow Geothermal Systems / GSHP	<i>Burkhard Sanner</i>
10.00	Environmental Aspects of GSHP – Drilling and Operation	NN
10:45	--- COFFEE BREAK ---	
11:00	<b>Section B: Basic Drilling (1,5h)</b>	<b>Drillers</b>
11.00	What are the specifics of drilling for geothermal?	<i>Jörg Uhde</i>
11.45	Test drilling and sampling, well tests	NN
12.30	--- LUNCH ---	
13:30	<b>Section C: Materials (2h)</b>	<b>Common</b>
13.30	Plastics for pipes, manifolds, etc.	<i>Hubert Graf</i>
14.30	Materials for drilling mud and grouting	<i>Peter Mielenz</i>
15.30	--- COFFEE BREAK ---	
16:00	<b>Section D: Regulations (2h)</b>	<b>Common</b>
16:00	European legal framework	<i>Burkhard Sanner</i>
16:15	Legislative background and licensing in Germany Sources for information (brochures, online)	<i>Erich Mands</i>
16:45	Examples of licensing procedures in Sweden, Spain, etc. Sources for information (brochures, online)	NN
17:15	Standards and guidelines – European and national	<i>Burkhard Sanner</i> <i>(David Norbury)</i>
17:40	Certification and education schemes	<i>Stefan Stumpf</i>
18.00	End of day 1	

## PROGRAMME FOR DRILLERS (2)

Programme - 18 March 2010		
08:00	<b>Section E: GSHP Design - Underground (2h)</b>	<b>Common</b>
08:00	Basics on geology – what engineers and drillers need to know	<i>Burkhard Sanner</i>
09:00	Determination of underground thermal conductivity	<i>Abraham/Richter</i>
10:00	--- COFFEE BREAK ---	
10:30	<b>Section F: BHE installation (2h)</b>	<b>Drillers</b>
10.30	Installation of BHE (and monitoring equipment, if required), grouting	<i>Jörg Uhde / Peter Mielenz</i>
11.30	Connection plastic welding, filling with heat carrier and de-aeration	<i>Jörg Uhde / Hubert Graf</i>
12:30	--- LUNCH ---	
14:00	<b>Section F: Practical Demo (4h)</b>	<b>Common</b>
14:00	Visit to drill rig manufacturing shop	<i>Prakla/GWE</i>
	Visit to drill mud laboratory	<i>GWE</i>
	Demonstration of TRT equipment	<i>Richter</i>
	Other visits as appropriate (pumps etc.)	
18:00	End of day 2	

## PROGRAMME FOR DRILLERS (3)

Programme - 19 March 2010		
08:00	<b>Section G: Well installation (2h)</b>	<b>Drillers</b>
08.00	Well screens, backfilling, pumps	<i>Olof Andersson</i>
10:00	--- COFFEE BREAK ---	
10:30	<b>Section G: Specific problems (2h)</b>	<b>Drillers</b>
10:30	Geological problems - Overburden drilling, Artesian	<i>NN</i>
11:30	New drilling techniques, drilling in built environment	<i>NN</i>
12:30	--- LUNCH ---	
13:30	<b>Course Conclusion</b>	<b>Common</b>
13:30	Final discussion and course evaluation	<i>all</i>
14:30	End of day 3	