

Objectives

The overall objectives of Annex 21 are to compile TRT experiences worldwide in order to identify problems, carry out further development, disseminate gained knowledge, and promote the technology. Based on this overview, a TRT state-of-the-art, new developments and further work are studied.

The Specific Objectives of Annex 21 are:

Overview

- Worldwide use of TRT (country, type, number)
- Purpose of test (design values, research & development, quality control / failure analysis).
- Applications (BHE, energy piles, heat pipe BHE's, etc.)
- TRT method (heating and / or cooling)
- Experimental setup (monitoring accuracy, etc.)
- Test procedure
- Evaluation models

New Developments and Further work

- Method to determine undisturbed ground temperature
- Swiss method for detailed logging of borehole temperature – swimming data acquisition 'Fisch', etc.
- Groundwater influence
- TRT while drilling
- Software for automatic evaluations
- Comparison of equipment and evaluation
- Initiate a common quality standard of TRT worldwide
- Invitation to "new" countries – workshop and courses on how to use TRT

Subtasks

The activities are organized in sub-tasks which are chaired by a responsible lead country.

Sub-task 1. TRT state-of-the-art Study

- Conduct a state-of-the-art survey covering worldwide use including TRT types, purpose, applications, experimental setup, test procedure and evaluation models

Sub-task 2. New Developments

- Method to determine undisturbed ground temperature
- Continuous temperature logging in several depths while testing
- Groundwater influence
- TRT while drilling
- TRT for special geometries like energy piles and horizontal ground collectors
- The Swiss Fish method etc.
- Pulse test

Sub-task 3. Evaluation methods and developments

- Comparison of equipment
- Comparison of test procedure
- Comparison of evaluation methods
- Software for automatic evaluations
- comparative evaluation of reference test data
- include heat capacity cp in the evaluation
- evaluation during testing e.g. to determine duration
- work out system design models which are especially based on TRT results

Sub-task 4. Standard TRT Procedures

- Initiate a worldwide TRT standard – best practice
- TRT for commissioning and past

Sub-task 5. Dissemination Activities

- Invitation to “new” countries – workshop and courses on how to use TRT
- Common website of compiled TRT information
- best practise document
- reports
- available samples of publications

Results

The results of this annex will be:

- A TRT state-of-the-art survey. This survey will help determine the need and direction of further R&D. The “State of the Art Report” will be published as an IEA technical document.
- Periodic documents and interim progress reports
- A final report describing the work carried out under this Annex.
- Best Practice TRT Manual
- Information database on a website.

Time Schedule

The Annex will run for 36 months from 2007 until 2010.

Activities	2007	2008	2009	2010
Experts' Meetings	-----x-	---x---x--	----x---x-	--x-----x--
1. State-of-the-art	-----	-----F	-----	-----
2. New TRT developments	-----	----- -	----- -	-----F
3. TRT Evaluation methods	-----	----- -	----- -	-----F
4. Standard TRT Procedures	-----	---- ------	----- -	-----F
5. Dissemination	-----	--V1-----	-----	-----

x planned meeting
 | interims report
 F final report
 V1 first version

Responsibilities for Sub-tasks

Table 1. Activity Plan – Thermal Response Test (TRT)	
SUB-TASKS	LEAD COUNTRY
1. TRT state-of-the-art	Sweden
2. New Developments	The Netherlands
3. Evaluation methods and developments	Germany
4. Standard TRT Procedures	Canada
5. Dissemination Activities	Finland