



## ECES Annex 12

### "High Temperature Underground Thermal Energy Storage"

#### **Third report to the Executive Committee 14.-15.6.1999**

Annex 12, phase 1 was approved during the Executive Committee Meeting in Paris on 4.-5.12.1997. Germany was decided to take the responsibility of the Operating Agent, and the Institute of Applied Geosciences of Justus-Liebig-University, Giessen, acts as Operating Agent. Phase 1 of the annex was extended at the Executive Committee meeting in Dec. 1998 in USA until 30.6.1999, to enable completion of the report and addition of economic considerations.

The objectives of Annex 12, phase 1 are to demonstrate that HT-UTES can be attractive to achieve more efficient economical and environmentally benign energy systems, and to disclose requirements and find problem solutions for reliable long-term operation. The type of UTES-systems concerned shall be confined to Aquifer Storage (ATES), Duct/Borehole Storage (BTES) and Cavern Storage (CTES).

Still the number of countries participating officially is rather small:

- Canada
- Germany
- the Netherlands
- Sweden

In particular the Swedish national group supported the OA very actively. Other countries have a general interest, but do not yet participate (Belgium, France, Turkey). Japan, yet not participating, also provided information in the field of water treatment. Regular contacts and information exchange was also maintained to Switzerland and the UK.

The data collection by the national teams did proceed slower than expected, mainly because of funding problems in the two important countries Netherlands and Sweden. In the Netherlands, concrete activities could not start before August 1998, and in Sweden the status and funding was uncertain, even if work for Annex 12 was done.

After the 2nd Expert's Meeting in Malmö, Oct. 1998, the completion of the report became increasingly difficult. In spite of several requests, no further

data were delivered from Netherlands, and no current economic data from other countries. Economic data on the new projects were only obtained for Neckarsulm (for Reichstag Berlin, economic data are due to be disclosed after 30.6.99, due to governmental restrictions). It was tried to finish the report nevertheless, but could not be done completely before June 1999. A draft with the current status is handed out to ExCom members.

The work in the first half of 1999 was tried to be co-ordinated through electronic communication and some bi-lateral meetings. A meeting of Annex 12 experts was held in conjunction with the Annex 8 meeting at Storforsen, Sweden, on June 12, 1999. All member countries were represented, and some observers present (Belgium, Japan and Turkey). The draft report was distributed and discussed, the status of ongoing and planned activities in the individual countries reported (s. Appendix A), and suggestions for Phase 2 of Annex 12 drafted:

#### Subtasks

(countries)

- System Concepts, Economy NL?
- Monitoring + Simulation B,  
CAN, D.
- Belgium: BTES, Mol (planned -?-) NL?
- Canada: ATES, Truro (planned)
- Germany: ATES, Berlin (realized)  
ATES, Neubrandenburg (under construction)  
BTES, Neckarsulm (realized)
- Netherlands (?) ATES, Gouda (realized)
- ATES - METSAC (Mobile Equipment for Testing of  
CAN, D, S,  
Scaling and Corrosion) TR?
- HT-TED (Thermal Response Test)  
CAN, D, S
- Water treatment full scale test CAN

Phase 2 should run until 31.12.2001

A possible Phase 3 after 1.1.2002 may comprise new full-scale projects with

- monitoring
- demonstration of water treatment

The Annex 12 text will have to be adapted and the workplan re-written accordingly. The ExCom is asked to approve Phase 2 with the subtasks listed above.

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## Appendix A

### **Recent or ongoing HT-UTES activities**

Status: Annex 12 meeting 12.6.1999

Canada:	Water treatment test going on
Germany: >1000m)	Neubrandenburg, ATES, waste heat (deep aquifer
Netherlands:	Study identified high pay-back, no new plans Evaluation of Utrecht ATES ongoing Monitoring of Gouda ATES ongoing
Sweden: construction	Anneberg (Danderyd), BTES, solar heat, under  (housing area, no R&D, only basic monitoring planned) A study showed the possibility to make use of waste heat through a HT-UTES for the district heating of Lund A study concerns a HT-BTES for waste heat to heat a  runway at  Luleå Kallax airport (increased runway length)

### **Planned HT-UTES activities**

Belgium:	BTES planned for VITO in Mol (with monitoring)
Canada: N.S.	Full-scale HT-ATES experimental plant planned in Truro,  HT-TED and ATES-METSAC planned
Germany:	Monitoring of Reichstag ATES, Berlin, planned Monitoring of Neubrandenburg ATES planned HT-TED and ATES-METSAC planned
Sweden:	HT-TED planned