

**IEA ECES IA**  
**Annex 20**  
**“Sustainable cooling with thermal energy storage”**

**Scope Definition Workshop**  
**Nice, France**  
**June 23, 2004, 9:00**

**Pro Memoria**

**Participants:**

AA Ali Asghar, Iran  
OA Olof Andersson, Sweden  
FC Frank Cruickshanks, Canada  
AH Andreas Hauer, Germany  
BH Bo He, Sweden  
MH Mahsen G. Haghghi, Iran  
RH Robert Himmler, Germany  
VL Volkmar Lottner, Germany  
MO Masaya Okumiya, Japan  
HP Halime Paksoy, Turkey  
AS Aart Snijders, The Netherlands  
BS Björn Sellberg, Sweden  
CS Christian Sasse, Germany  
ES Ebrahim Shoara, Iran  
LS Lynn Stilles, USA  
HT Hideki Tanaka, Japan

**Agenda:**

1. Welcome and introduction of participants
2. Presentation of Annex 20 concept paper – H. Paksoy and M. Okumiya
3. Determining interested countries and goals in participations
4. Presentations of projects
  - Thermal energy storage in office building foundations – Christian Sasse, Germany
  - High-capacity cool thermal energy storage for peak shaving – Bo He, Sweden
  - Storage of Solar Thermal Energy in a Liquid Dessicant Cooling System - Andreas Hauer, Germany
5. Discussion
  - Title and scope of annex
  - Management of annex
    - Determining operating agent
    - Task sharing or cost sharing
6. Next steps

## **1. Welcome and introduction of participants**

HP opened the meeting and welcomed the participants. Address list for the participants is given in Appendix 1.

## **2. Presentation of Annex 20 concept paper**

HP presented Annex 20 concept paper prepared by HP and MO. The presentation is given in Appendix 2.

## **3. Determining interested countries and goals in participations**

### Sweden:

BS: Interested. Funding possibilities with industrial partners will be investigated. OA: Sweden is interested in solving issues given in this annex with underground thermal energy storage (UTES) and alternative combinations with phase change materials (PCM). PhD thesis of BH is dealing with cooling in district cooling system and combining borehole thermal energy storage (BTES) and PCM.

### Iran:

ES: Interested in solar cooling, technologies for improving efficiency of gas turbines, hot and humid climate needs reducing of peaks (600 % of winter load), yearly and diurnal, tariffs: 300% summer compared to winter

### Canada:

FC: Interested in UTES projects, projects are not determined, yet.

### Germany:

VL: New project by CS evaluating different concepts of UTES combined with air conditioning.

### The Netherlands:

AS: Interested in all kind of cooling systems in combination with TES.

### Japan:

Interested in all topics mentioned for short term TES. Heat Pump and Thermal Energy Storage Center of Japan (HPTCJ) is looking for budget from TEPCO and METI.

### USA:

Continued interest in UTES in general. Possibility of presenting projects from USA: one from Stockton ATES project, three building projects one including a science lab. desiccant cooling. DOE has proposed a budget on thermal energy storage (primarily short term). There is also interest from ice storage manufacturers. The next international thermal energy storage conference to be held in Stockton, NJ is a good chance to attract interest.

### Turkey:

Greenhouse heating and cooling with UTES project is starting in August.

### Other Countries:

There were some interest from countries represented at the “Cooling Buildings in a Warming Climate” workshop and continued interest from Annex 14. These countries are: France, Italy, Malaysia, Malta, Portugal, Thailand.

## **4. Presentations of projects**

- Thermal energy storage in office building foundations – Christian Sasse, Germany (Appendix 3)
- High-capacity cool thermal energy storage for peak shaving – Bo He, Sweden

- (Appendix 4)
- Storage of Solar Thermal Energy in a Liquid Dessicant Cooling System, Andreas Hauer, Germany (Appendix 5)

## 5. Discussion

### Scope of the annex:

The scope of the annex was reviewed and some additional comments were made. The new Annex will follow a project oriented approach for optimized integration of TES in cooling systems. The scope includes:

- Advance the prospects of cooling with TES systems.
  - Technology development (short-term, long-term, alternative combinations of short-term with long-term TES utilizing renewable/natural energy (ACES))
  - Establishment of design method (development of new design tool)
  - Feasibility studies
  - Design competition
  - Demonstration projects
- Benefits on environment
  - Dispatch of power plant sensitivity
  - Comparison of different concepts
  - Integration of TES into systems and combination of different TES options
- Technology transfer to new countries (including non-IEA and non-ECES).

### Title of the annex:

HP: Title of the annex should be more attractive and address issues on cooling.

VL: Should “Cooling of buildings” be explicitly mentioned in the title? OA: Also connection to peak shaving; may also be mentioned, instead of sustainable. HP: Japan wants to emphasize the sustainability and the issue of CO<sub>2</sub> reduction of short term storage. VL: Peak shaving is only referring to diurnal TES. Discussion about ice storage in Japan that it is not always an energy saving system, maybe this could be an issue within the annex. AS suggested “Cool Thinking” for the title of the annex. HP: We can use a subtitle together with an attractive title like “Cool Thinking”. The title ideas will be exchange by e-mail until October 15, 2004.

### Management of annex:

- Determining operating agent
 

HP was asked to prepare the concept paper for Annex 20 as the Operating Agent of previous Annex 14 “Cooling in all climates with thermal energy storage”. HP declared that it is not possible for her to be the OpA of Annex 20; she will carry on the duty until the next ExCo meeting in Lleida, Spain in December, 2004. MO was asked if he would be interested to be the OpA, he will ask at the HPTCJ and give an answer until the next ExCo meeting.
- Task sharing or cost sharing
 

HP: Management of an annex can be task-sharing or cost-sharing in IEA IAs. In cost-sharing, OpA of the annex proposes a budget for the management of the annex and participating countries share the budget. This has to be approved by the ExCo. In task-sharing, participating countries share the tasks of the annex and the budget for each expert comes from the individual countries. VL: Cost sharing might be difficult for administrative reasons for some countries.

## 6. Next steps

- Suggestions for the annex titles
  - October 15, 2004
- Determine the operating agent
  - Before IEA ECES ExCo meeting in December, 2004
- Kick-off Workshop (Spring or Fall 2005, ??)
  - Possibility to have it before or after IEA HP Conference May 2005, Las Vegas
  - determine the interested countries and their goals in participations
  - interested experts
  - develop the work plan and the concept into final annex proposal
- Present to IEA ECES ExCo (Fall 2005, ??)

### Abbreviations:

ECES IA	Energy Conservation Through Energy Storage Implementing Agreement
ExCo	Executive Committee
HP	Heat Pump Programme
IEA	International Energy Agency
PCM	Phase Change Material
TES	Thermal Energy Storage
UTES	Underground Thermal Energy Storage

### Appendix 1: Mailing List

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