International Energy Agency
Energy Conservation through Energy Storage

Annex 14

Cooling in All Climates with Thermal Energy Storage

Workshop
June 4-5, 1999
Antalya, Turkey

Report to the Executive Committee
June 14-15, 1999
Luleå, Sweden

Background

A new Annex on "Cooling in all climates with thermal energy storage" has been planned within the International Energy Agency (IEA), Implementing Agreement on Energy Conservation through Energy Storage (ECES IA). At the 45th Executive Committee Meeting of ECES IA it was decided to have a preparatory workshop designed for discussions and information exchange with the purpose of identifying high priority areas where thermal energy storage systems for cooling will have greatest impact.

Workshop Organization

Workshop was organized by Çukurova University in Antalya, Turkey on the 4th and 5th of June 1999. The organization committee, appointed by the Executive Committee for the workshop was:
Halime Paksoy *Çukurova University, Turkey*
Mari Gustafsson *Royal Institute of Technology, Sweden*
Frank Cruickshanks *Environment Canada*
Takeshi Yoshii *Heat Pump & Thermal Energy Storage Center of Japan*
Sung Hwang Cho *Korea Institute of Energy Research*

The workshop was sponsored by Çukurova University Center for Environmental Research and Turkish Scientific Research Organization (TÜBÝTAK). The proceedings of the workshop is being prepared by Çukurova University Center for Environmental Research and will be sent to the participants.

Participants

There were 18 participants from Canada, Germany, Israel, Japan, Sweden and Turkey. 8 papers were presented in the 1st and 2nd sessions on June 4th (See enclosed program). A panel discussion on Annex 14 was held on June 5th with the following discussion items:

- Scope
- Objectives
- Activities
- Time schedule
- Level of effort
- Workplan
- Operating agent
- Participating countries

Results

The results from the workshop revealed that there is a need for a new annex. The participants' opinion about the results of the workshop can be summarized as:

• Many different cold storage applications in the world
• Different solutions for different climates
• Competition between different applications
• Simple and working systems for countries that do not have infrastructure
• Direct systems – without temperature lift
Indirect systems – with temperature lift, that is with machinery (compressors, sorption systems)
• Cold chain for food production and distribution
• Experience from hot storage can be used in cold storage
• Back-up systems for power failure
• Cogeneration with cold storage for boosting the production of electricity
• Healthy environment
• Suggestion to collaborate through EU 5th Framework program

Suggested topics of interest for the new Annex:

• Sources of cold (artificial and natural)
• Feasible boundary conditions
• Comparison of alternative solutions
• Comparison of different storage applications for different applications
• Integration of different storage alternatives (hybrid systems)
• Configuration concepts
• Quick design and analysis tools
• Exchange of information
• Environmental concern