

SHC Task 48 Quality Assurance and Support Measures for Solar Cooling

THE ISSUE

The demand for air-conditioning is rapidly increasing, especially in developing countries. And the potential for solar cooling to meet this demand is immense. The results of past IEA SHC work in this field (most recently, *SHC Task 38: Solar Air-Conditioning and Refrigeration*) have demonstrated the technology's potential for building air-conditioning, particularly in sunny regions, and identified work needed to achieve economically competitive systems that provide solid long-term energy performance and reliability.

OUR WORK

Finding solutions to make solar thermally driven heating and cooling systems at the same time efficient, reliable and cost competitive is the goal of this Task. These three major targets should be reached thanks to four levels of activities:

- 1) Development of tools and procedures to characterize the main components of Solar Air-Conditioning systems.
- 2) Creation of a practical and unified procedure, adapted to specific best technical configurations.
- 3) Development of three quality requirements targets—prescriptive and performance based.
- 4) Production of tools to promote Solar Thermally Driven Cooling and Heating systems.

PARTICIPATING COUNTRIES

Australia
Austria
Canada
China
France
Germany
Italy
United States

The scope of the work covers technologies for the production of cold water or conditioned air by means of solar heat, that is, starting with the solar radiation reaching the collector and ending with the chilled water and/or conditioned air transferred to the application. Although the distribution system, the building, and the interaction of both with the technical equipment are not the main topic of the Task this interaction will be considered where necessary.

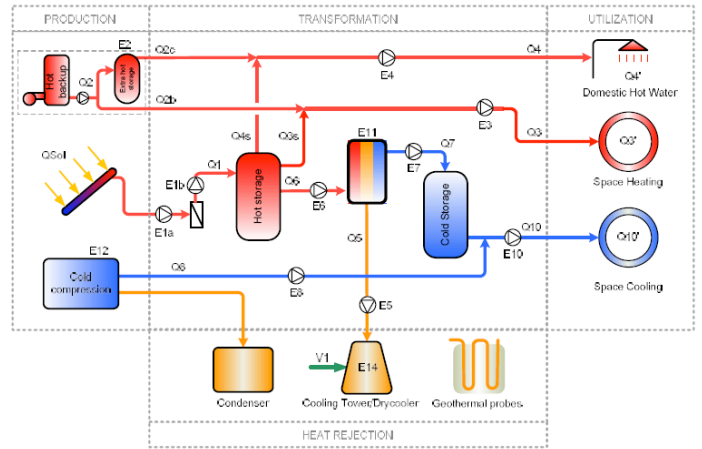
Task Date 2011-2015
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KEY RESULTS OF 2013

Measurement and Verification Procedure Report

While Measurement & Verification (M&V) procedures (e.g., IPMVP, ASHRAE and FEMP) exist for general energy conservation measures, it is desirable to have a more specific and targeted guide for solar cooling in order to simplify procedures, improve confidence in results and assist M&V implementation with more detailed guidance.

The resulting in-situ and ex-situ measurement procedures have been written up as a document suitable for submission as a draft standard.



Schematic diagram of a large customized solar cooling/heating/DHW system.

The present final deliverable is a monitoring procedure and a draft standard integrating the following aspects:

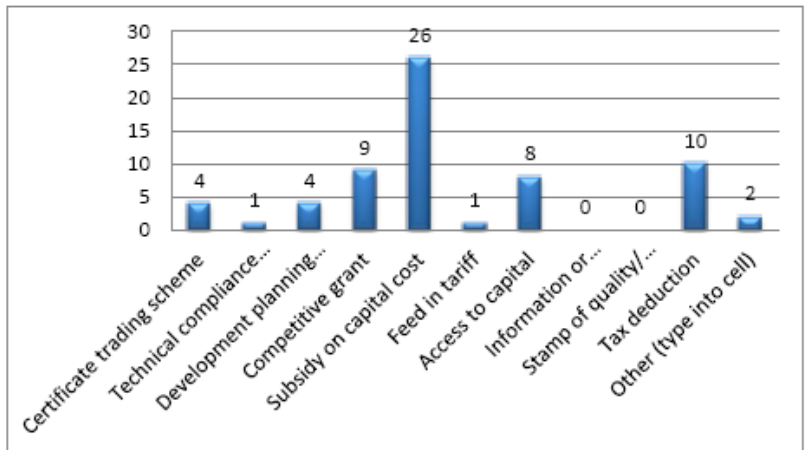
- Presentation of a generic scheme for solar cooling installations;
- Definition of one (or two maximum) performance indicators, with associated calculation method applied to the generic scheme;
- Prescription of the sensors required (position, technologies, etc.) in order to obtain the needed information for calculating the performance indicator(s); and
- Definition of the analysis method for reporting the performance and quality of the installation.

Review of Relevant International Standards Rating and Incentive Schemes

A large number of government incentive programs and industry development programs have been instituted in different jurisdictions, to assist the renewable energy and building energy efficiency industries.

These programs call up procedures for quantifying benefits, rating effectiveness and achieving robust measurement and verification.

A database of relevant standards, processes and incentives has been created and links to the needs of the solar heating and cooling industry analyzed.



Responses by category show the dominance of direct financial measures.