

# 2008 HIGHLIGHTS

## SHC Task 35 PV/Thermal Solar Systems

### THE ISSUE

Solar collectors that combine photovoltaic (PV) panels and solar thermal collectors to produce both thermal and electric energy are called PV/thermal solar collectors (often referred to as PV/T collectors). By combining these two technologies, PV/T systems are able to generate more energy per unit surface area than side by side PV panels and solar thermal collectors. Calculations made by ECN in the Netherlands show that by using PV/T collectors instead of side-by side-systems, it is possible to reduce the collector area by 40% and still generate the same amount of energy.

### OUR WORK

The objective of *SHC Task 35: PV/Thermal Solar Systems* was to catalyze the development and market introduction of high quality and commercial competitive PV/thermal solar systems, to increase general understanding of the technology, and to contribute to internationally accepted standards on performance, testing, monitoring and commercial characteristics of PV/thermal solar systems in the building sector.

SHC Task 35 was a three-year collaborative project with the IEA's Photovoltaic Power Systems Programme that ended in December 2007. Final Task publications will be produced and posted on the SHC web site by mid-2009.

### PARTICIPATING COUNTRIES

Canada  
Denmark  
Israel  
Sweden  
Netherlands

### KEY RESULTS OF 2008

#### Survey

Sixty-five architects and solar dealers from Canada, Denmark, Germany, Italy, Spain, Sweden, and the USA were interviewed to learn what affects the design, purchase, supply and installation of PV/T projects. The main conclusions of the survey were that both architects and solar companies are very interested in PV/T (e.g., for generating publicity and additional business) and the key advantages of this technology are that it can be used when roof space is limited, can reduce costs due to lower installation costs, can be integrated into a building, and can provide a more uniform appearance than a side-by-side system.

#### Collector Testing

The testing of existing PV/T collectors has not only increased understanding of the collectors' performances, but also provided a basis for suggesting standard methods for testing the characteristics and durability of PV/T collectors.

A series of collector tests were conducted at the University of Padova in Italy: 1) flat

plate glazed liquid PV/T collector from PVTWINS in the Netherlands (previously tested at the Danish Technological Institute), 2) prototype COGEN from Ecosolar Engineering, DTG in Italy, and 3) unglazed liquid/air PV/T collector MSS from Millennium Electric in Israel.



*PV/T test stands at the University of Padova in Italy.*

In addition, a transpired air PV/T collector from Conserval Engineering in Canada, previously tested at the National Solar Test Facility in Canada, was tested at the Danish Technological Institute. The University of Lund in Sweden also conducted tests on a variety of PV/T collectors.

Results and evaluations of the collector tests will be published in a report in mid-2009.

## Resources

Reports are available on the SHC web site are 1) overview of commercially available PV/T collectors and 2) overview of PV/T components and projects.

PV/T collector models are being compiled and will be available on the SHC web site in mid-2008. This work included modifying TRNSYS models for water/air PV/T collectors and concentrating PV/T collectors as well as completing a new model for a transpired air PV/T collector. A simulation program for PV/Thermal solar systems is under development that will offer users a simple version and a detailed version.

In addition, three reports will be available in mid-2009.

- A report on recommended standardized method for characterizing and monitoring PV/T modules. This method will help to quantify the thermal and electrical output of PV/Thermal collectors.
- A report on experiences from outdoor testing and suggestions for new test methods for PV/T collectors
- A report on the experiences and monitoring results for realized PV/T installations.

<b>Project Date</b>	<b>2005-2009</b>
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