

# PV/T collectors

technologies combine to increase output



Solar collectors that combine PV panels and solar thermal collectors to produce both solar thermal and electric energy are called PV/thermal solar collectors. By combining these two technologies, PV/thermal systems are able to generate more energy per unit surface area than side by side photovoltaic 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.

To support the development and market introduction of high quality and commercially competitive PV/Thermal Solar Systems, the SHC Programme initiated SHC Task 35 on PV/thermal solar systems in January 2005 as a collaborative program with the IEA Photovoltaic Power Systems Programme. In addition to catalyzing the market for PV/T systems, participants are working to increase the general understanding of the systems and to contribute to internationally accepted standards on the performance, testing, monitoring and commercial characteristics of PV/Thermal Solar Systems in the building sector.

The Task is organised into 5 subtasks on 1) the market and commercialization, 2) energy analysis and modelling 3) product and system development, test and evaluation, 4) demonstration projects, and 5) dissemination of results. The countries participating in this work are Canada, Denmark, Israel, The Netherlands, and Sweden with input from experts in Greece, Hong Kong and Italy.

At this stage of the Task, tests of different PV/T collectors are being carried out in a number of countries. The aim of these tests is to achieve a better understanding of the performance of existing systems and to define standard methods for testing the characteristics and durability of PV/T systems. Methodologies being used are based on the experiences from the participating laboratories and the most recent international standardisation of testing procedures for solar systems.

- ▶ Tests of a flat plate liquid PV/T collector from the Dutch manufacturer PVTWINS, see Figure 1, were completed in September 2006 by the Danish Technological Institute. The same collector will now be tested at the University of Padova in Italy.
- ▶ A transpired air PV/T collector from Conserva Engineering in Canada is currently being tested at the National Solar Test Facility in Canada, see Figure 3. Tests of the same collector type are in preparation at the Danish Technological Institute.
- ▶ Tests of other types of PV/T collectors will also be carried out in Sweden and Italy.

Other results in this project will include articles based on market survey interviews and a revised roadmap for the commercialization of PV/T systems, a downloadable overview of PV/T components and projects, downloadable packages of PV/T simulation models and design tools, and a published summary on the experiences gained from working PV/T systems. A significant activity will be new demonstration projects. The Task will begin advertising for these projects soon.

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**The liquid PV/T collector (PVTWIN 422 from PVTWINS of The Netherlands) tested at the Danish Technological Institute, Denmark**



**Preparation of the test stand for the air PV/T collector at the National Solar Test Facility in Canada.**

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