



IEA SHC Task 35

PV/Thermal Solar Systems

WWW.IEA-SHC.ORG/TASK35

Objective

The objectives of the Task are to catalyse the development and market introduction of high quality and commercial competitive PV/Thermal Solar Systems and to increase general understanding and contribute to internationally accepted standards on performance, testing, monitoring and commercial characteristics of PV/Thermal Solar Systems in the building sector.

Organisation

IEA SHC Task 35 "PV/Thermal Solar Systems" was initiated by the International Energy Agency (IEA) Solar Heating and Cooling (SHC) Programme in January 2005 and will be running for three years.

The Danish Energy Authority, acting through Mr. Henrik Sørensen, Esbensen Consulting Engineers A/S, Denmark, is designated as Operating Agent for the Task.

The Task is organised in 5 subtasks:

- Subtask A: Market and Commercialisation of PV/T
- Subtask B: Energy Analysis and Modelling
- Subtask C: Product and System Development, Tests and Evaluation
- Subtask D: Demonstration Projects
- Subtask E: Dissemination

Visit the Task 35 website: <http://www.iea-shc.org/task35> for more details on activities and results.

How to join

National experts can be assigned to participate in the Task from both IEA SHC and IEA PVPS (Photovoltaic Power Systems) Executive Committee members or the participants can be accepted by sponsors of either of the two programmes. Funding of your participation cannot be obtained from the IEA, but should be discussed with your national ExCo-member or sponsor of your participation.

The Task welcomes all experts who would like to join and contribute to the Task – especially industries working in this field are invited to contribute to the planning of the activities and asking the important questions to be dealt with seen from their perspective.

If you are interested in learning more about your possibilities of participation please contact Project Manager Jan Hansen or Operating Agent Henrik Sørensen.

Further information:

Visit www.iea-shc.org to learn more about the activities of the IEA Solar Heating and Cooling Programme

Contact

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Introduction to PV/Thermal Solar Systems technology

A PV/Thermal Solar System is a combination of photovoltaic components/systems and solar thermal components/systems which produce both electricity and heat from one integrated component or system. The heart in a PV/Thermal Solar System is a PhotoVoltaic/Thermal module, or PV/T module which is a combination of photovoltaic cells with a solar thermal collector, forming one device that converts solar radiation into electricity and heat simultaneously. Apart from the PV/T module also components as hot water storage tanks, heat exchangers, piping, controllers, inverters, wiring and heat pumps can form part of a PV/Thermal Solar System. Electricity can be used directly or fed to the grid and the heat generated simultaneously from the PV/T module can be utilized for heating of air or water.

As a result PV/T modules can generate more energy per unit surface area than side by side photovoltaic panels and solar thermal collectors, potentially at a lower production and installation cost. Moreover, PV/T modules share the aesthetic advantage of PV. Because of their high efficiency per unit surface area, PV/T is particularly well suited for applications with both heat and power demand and with limited roof space available.

In the table below the primary types of PV/Thermal Solar Systems are listed, many of the products available on the market now.

PV/T liquid collector



Un glazed module (ECN)



Glazed module (PVTWINS)

PV/T air collector



Un glazed module (Grammer)



Glazed module (Aidt Miljø)

Ventilated PV with heat recovery



Facade system (TFM)



Roof system (TFM)

PV/T concentrator



Stationary module (Lund, Priono AB)



Tracking module (ANU)

Outlook

PV/T is a very promising technology with a large potential and PV/T systems can be applied in a large part of the present solar thermal market, including domestic hot water systems. In the short term, multi-family buildings may be an important market, due to the limited roof area available per household. In the medium and long term, the most promising application for PV/T systems seems to be domestic water heating and space heating, especially following the trend of very low energy houses where solar could cover most energy demands. In the long term, professional application (industry, agriculture) and applications such as solar cooling will become interesting for PV/T.

To ensure a successful implementation of PV/T to the market it is essential to agree on performance and reliability standards for PV/T, and to increase the optical and thermal efficiency and the long-term reliability of PV/T, with the ability to be fully integrated in the building shell – which also are the key activities of IEA SHC Task 35.