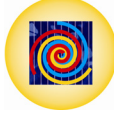


Commercially Available PVT products

H.A. Zondag,
Energy Research Centre of the Netherlands
14 July 2006

About IEA SHC Task 35

On January 1st, 2005, a three-year research work – Task 35 "PV/Thermal Solar Systems" – was initiated as part of the International Energy Agency (IEA) Solar Heating and Cooling (SHC) Programme. The objectives of Task 35 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. **See also www.iea-shc.org/task35**



Disclaimer:

This information was provided by the manufacturers. The IEA and IEA Solar Heating and Cooling Programme take no responsibility for accuracy of the numbers presented.

The thermal and electrical outputs were measured according to the method of the manufacturer. The task has not yet standardised this measurement.



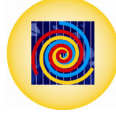
PVT products

- **PVT air collectors**
 - Aidt Mijljø / Grammer Solar / Conserval Engineering
- **Ventilated PV with heat recovery**
 - Secco Sistemi
- **PVT liquid collectors**
 - PVTWINS / Millennium Electric
- **PVT concentrators**
 - Arontis / HelioDynamics / Menova

For this presentation, information was used from the following sources

- PVT IEA task 35 products & projects matrix (www.iea-shc.org/task35)
- PVT roadmap (www.pvtforum.org)
- PVT platform (<http://www.ecn.nl/nl/egon/extra/extranet/pvt-platform/het-pvt-platform/>)
- Manufacturer websites and personal communication with manufacturers

!!! The prices presented in this overview are meant as a rough indication and not as actual quote information!!!



PVT Air Collectors

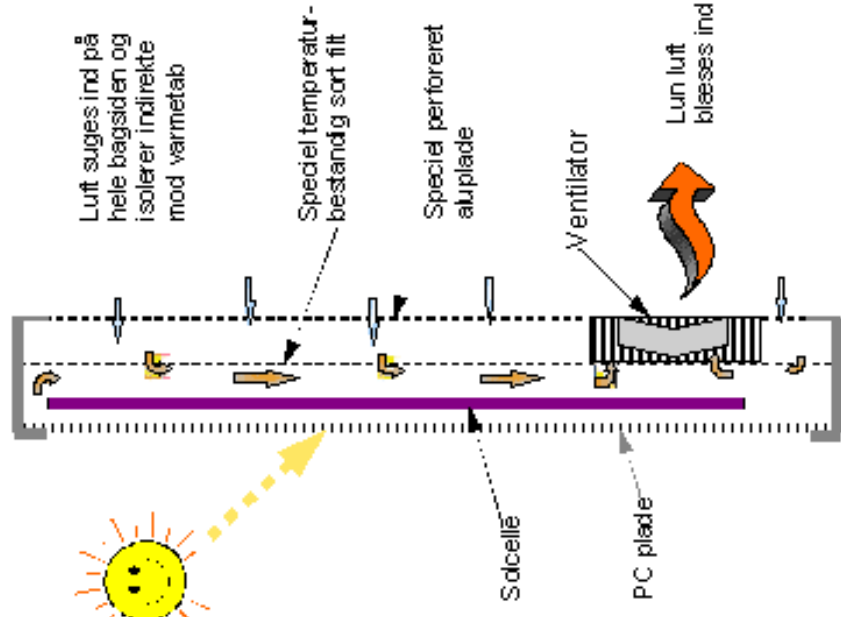
AidT Miljø - SolarVenti

PVT collector for automatic ventilation of summer cottages with PV on part of the absorber

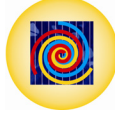
Length/Width [m]	Area [m ²]	Price per m ²
0.54 / 0.72	0.39	390 Euro
1.02 / 0.72	0.73	590 Euro
1.99 / 0.72	1.43	890 Euro
3.00 / 1.02	3.06	1463 Euro



Princip for luftsofanger med solcelle og ventilator integreret. (Patenteret)



<http://www.aidt.dk>



PVT Air Collectors

Grammer Solar - Twinsolar

<http://www.grammer-solar.de/twinsolar/>



PVT collector for ventilation of summer cottages with PV on part of the absorber

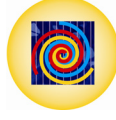
Product name	Length/Width (m)	Area (m2)	Price (euro)
Twinsolar 2.0 - SLK	2.0 / 1.0	2.0	1698
Twinsolar 4.0 - SLK	4.0 / 1.0	4.0	3289
Twinsolar 6.0 - SLK	6.0 / 1.0	6.0	4268
Twinsolar 8.0 - SLK	8.0 / 1.0	8.0	5378
Twinsolar 10.0 - SLK	10.0 / 1.0	10.0	6148
Twinsolar 4.5 - SLK	2.21 / 2.25	4.55	3528
Twinsolar 8.5 - SLK	2.21 / 4.25	8.55	5568
Twinsolar 12.5 - SLK	2.21 / 6.25	12.55	6798

Grammer Solar – PV-Hybridkollektor

PVT collector with PV over the whole absorber

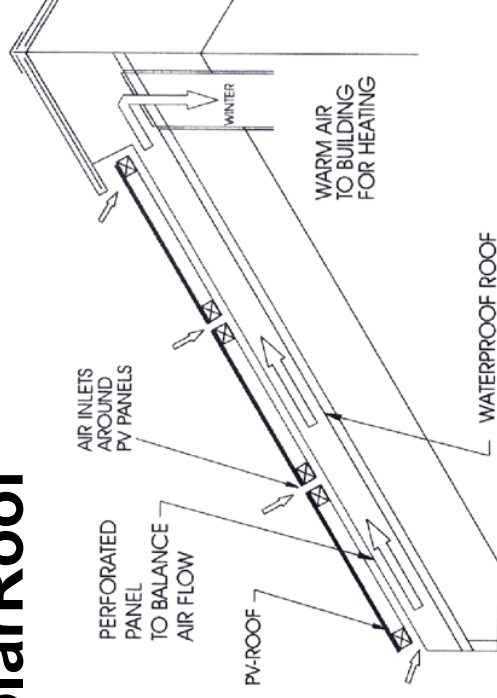


http://www.grammer-solar.de/photovoltaik/pv_hybrid.shtml



PVT Air Collectors

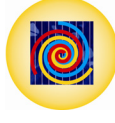
Conservall Engineering – PV SolarRoof



Product name	Length/Width (m)	EI power (W)	Th power (W)	Total power (W)
STPV900	1.75 / 1	190	710	900

Solarwall perforated absorber with PV on top
<http://www.solarwall.com/roof/roofCase.html>

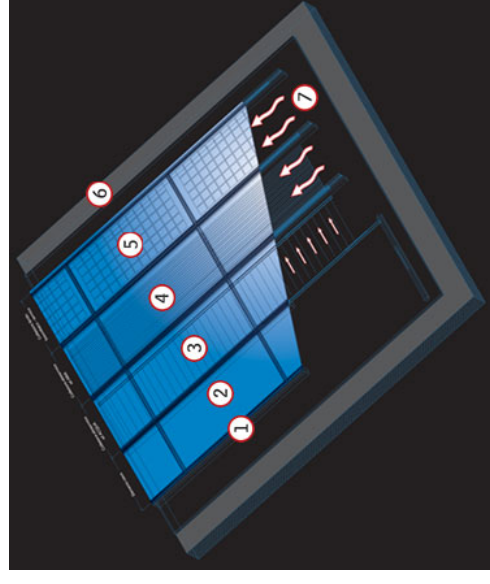
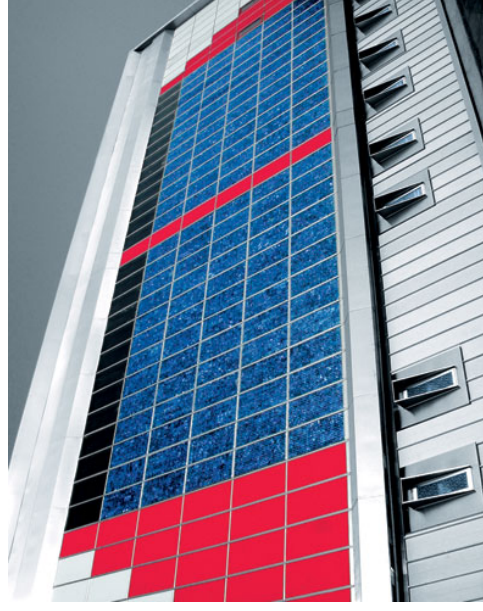
This product is also licenced to Solarwall International (www.solarwall.de)



Ventilated PV with heat recovery

Secco Sistemi – TIS (Tetto Ibrido Solarizzato)

This is part of a roofing system and cannot be applied as add-on on existing roofs.

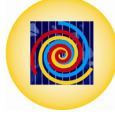


Schematic representation of the integral solar roof system TIS

- 1) Metal support profiles
- 2) Non-energetic finishing element
- 3) Solar thermal component (water)
- 4) Solar thermal component (air)
- 5) PV-laminate
- 7) Forced convection

In addition to the power, the ventilated PV provides hot air that can be used for room heating or to assist a solar cooling system in summer

<http://www.seccosistemi.it/solar/>



PVT Liquid Collectors

PVTWINS – PVTWIN collector

Glazed sheet-and-tube

PVT collector

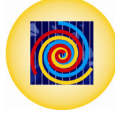


product name	length/width (m)	area (m ²)	appr. price (euro)	El power (W)	Th power (W)
PVTWIN 212	1.050 / 1.895	1.28		150	765
PVTWIN 313	1.050 / 2.760	1.92		220	1150
PVTWIN 422	1.895 / 1.895	2.56	~980 euro/m ²	295	1535
PVTWIN 515	1.050 / 4.245	3.2		370	1920
PVTWIN 616	1.050 / 5.325	3.84		440	2300
PVTWIN 623	1.895 / 2.760	3.84		440	2300
PVTWIN 824	1.895 / 3.615	5.12		590	3072
PVTWIN 1025	1.895 / 4.245	6.4		735	3840

PVTWINS

Unglazed sheet-and-tube PVT collector

<http://www.pvtwins.nl/>



PVT Liquid Collectors

Millennium Electric – MSS[®] Multi solar panel

Un glazed PVT collector with the added functionality of air heating

Length/width [m]	Area [m ²]	App. price per m ²	EI power [W]	Th power [W]
2.17 / 1.27	2.8	~850 \$	300	2000



<http://www.millenniumsolar.com/>



PVT Concentrators

Arontis solar solutions – Solar8

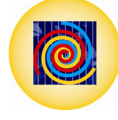


One-axis tracking, modular PVT concentrating collector for building as well as ground installations.

Designed for hotel roof tops, sports and recreation

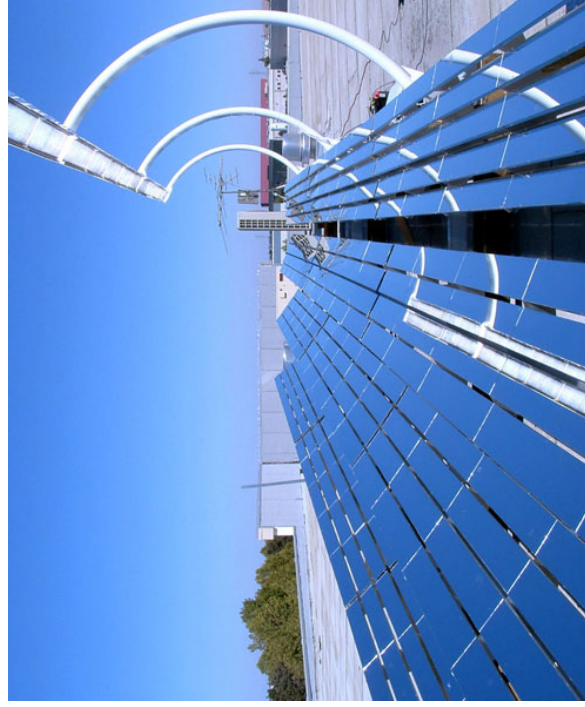
<http://www.arontis.se/>

product name	length/width/height (m)	ap. area (m2)	approx. price (euro)	El power (W)	Th power (W)
Solar 8	5.0/2.0/1.4	~5	~ 700 €/m2 (glass area)	500	2250



PVT Concentrators

HelioDynamics – Harmony™ HD211



Tracking, modular concentrating PVT collector

Designed for mounting on flat and sloping roofs or pole-mounted over parking areas
Designed for mid-latitudes (20° to 40°).

<http://www.hdsolar.com/>

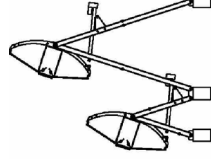
product name	length/width/height (m)	aperture area (m ²)	appr. price (euro)	El power (W)	Th power (W)
Harmony HD211	12.0/2.9/2.4	24	10,000	1000	10,000

PVT Concentrators

Menova Engineering Inc – Power Spar

Modular, concentrating PVT collector, mainly for domestic application

<http://www.power-spar.com/>



The Power-Spar has been specifically engineered to provide enhanced performance even when exposed to extreme winter temperatures

product name	length/width/height (m)	ap. area (m2)	approx. price (euro)	El power (W)	Th yield (W)
PS 1	2.4/1.8/0.9			100 (400)	1,500
PS 2x1	4.9/1.8/0.9		~870 euro/panel	200 (800)	3,000
PS 1x2	2.4/3.1/2.6		for large system, including controller, web interface	200 (800)	3,000
PS 2x2	4.9/3.1/2.6		actuators and frame	400 (1600)	6,000
PS 3x1	7.3/1.8/0.9			300 (1200)	4,500
PS 3x2	7.3/3.1/2.6			600 (2400)	9,000
PS 6x2	14.6/3.1/2.6			1200 (4800)	18,000