Photovoltaic-Thermal Systems (PVT) achieve market relevance

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Task Organisation

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A
PVT systems in operation
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B
PVT Performance characterization
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C
PVT Systems modelling
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D
Systems performance assessment, dissemination and market support
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Highlight and Trends

Ed. 2019 PVT for the first time
Survey

- PVT-collector
  - Type of collector
  - Collector area
  - Power output (thermal, electric)
  - PV Technology
  - Export

- Application
  - Type of application
  - Number of installations
  - Average system size
  - Etc.
Market overview

- Total: 26 PVT collector manufacturer
  (non-exhaustive overview)

- Countries: 11
Category of PVT collectors

Water Collectors
- Uncovered (wisc)
- Covered
- Evacuated tube

Air Collectors

Concentrators

Source: DualSun
Source: 3F Solar
• Source: Naked Energy
Source: GSE Integration
Source: Systovi
Source: Solarus
Source: Sunoyster
Market overview – PVT-Producer

Distribution of PVT-manufacturer by collector type

- Covered water collector: 28%
- Evacuated tube collector: 4%
- Concentrator: 8%
- Air collector: 12%
- Uncovered water collector: 48%
World map – Installed PVT collector area

Cumulated installed collector area by end of 2018:

- 57% uncovered
- 41% air collectors
- 2% covered

~ 1.1 Mio m²

26 countries
PVT - European market

Market leader:
France (442,500 m²)
Germany (109,400 m²)
Netherlands and Italy (15,000 m²)
Global installed capacity by country

Thermal capacity: 524,2 MWth
Nominal PV Power: 178,2 MWpeak
Global PVT-system plants in operation by type of application

By end of 2018: >22,900 systems, 581,000 m²

~2,200 systems with uncovered collectors

• 75% DHW – SFH, MFH, hotels, hospitals, etc.
• 21% Combi systems
Uncovered PVT GS-Regeneration

Building complex (7 MFH, 50 flats, swimming pool)

Heating system
31 boreholes of 150 m
Centralized heat pumps
Heat recovery for pool and DHW
672 m² PVT collector area

Performance:
Thermal yield 400 kWh/m²
Electrical yield 130 kWh/m²
Degree of GS regeneration 98 %
Covered PVT collectors for hotels

Installed collector area 148 m²
Ibiza, Spain

Performance:
Thermal yield 112.814 kWh/a
Electrical yield 34.600 kWh/a
CO2 saving: 41.639 kg/a

Source: EndeF
Low concentration PVT collectors for industrial application

Installed capacity: $110\text{kW}^{\text{th}}$ and $22\text{kW}^{\text{p, elect}}$

Katwoude, Netherlands

Performance:
450 MWh heat and 15 MWh electricity

Source: Solarus