

company: 3F Solar Technologies GmbH,
founded 2012

Product: hybrid solar collectors (PVT)

service: conception and installation of renewable
energy systems

Technology: 2 Patents and specific production know
how

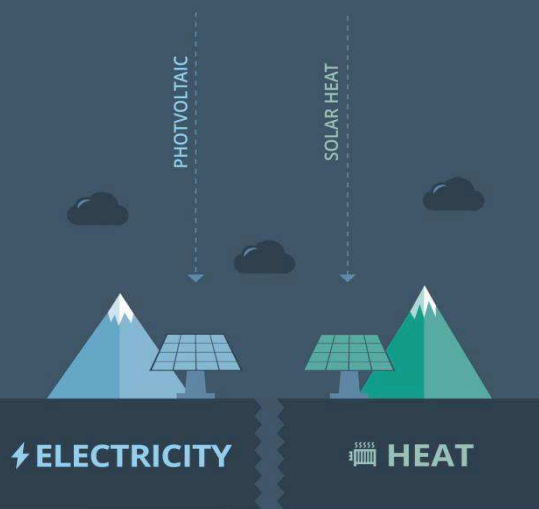
Distribution: end customer, B2B marktintegrator,
specialist retailers

Skaling: Technology Licensing

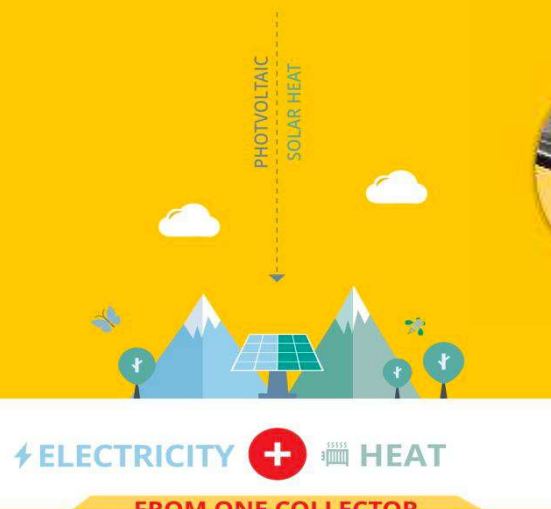


SOLAR ONE
Strom+
Wärme
aus *einem* Sonnenkollektor

PREVIOUSLY
2 separate collectors.
Electricity or heat.



BRAND-NEW
1 hybrid collector
for electricity + heat.



Efficiency
71%

Extremely slim.
Extremely efficient.
Extremely nice.

290 W_p
electric power

825 W
thermal power

1682 x 1008 x 66 = 1,7 m²
height x width x depth (mm)

42 kg
weight

SOLAR ONE
The most efficient solar collector
of all time.

- > Electricity AND heat
- > Lower installation costs
- > higher electricity yield through cooling
- > Twice the value added per m²
- > Defrost function
- > Highest quality
- > Smart & stylish



SOLAR ONE

71 %
Wirkungs
grad

290 W _p elektrische Leistung	+	825 W thermische Leistung
↑ zeitgleiche Leistung! ↓		



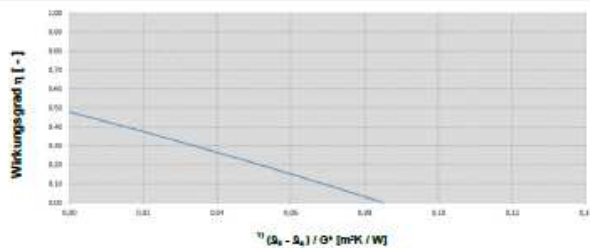
Hybridkollektor SolarONE

Kollektorleistung in Watt (gemäß EN ISO 9806)

	Bestrahlungsstärke W / m^2		
	400 W/m^2	700 W/m^2	1000 W/m^2
$\eta_{10} \Delta t_k - \Delta t_a = 10 \text{ K}$	238	481	725
$\eta_{30} \Delta t_k - \Delta t_a = 30 \text{ K}$	56	298	542
$\eta_{50} \Delta t_k - \Delta t_a = 50 \text{ K}$	-	104	348

Wirkungsgradkennlinie (gemäß EN ISO 9806)

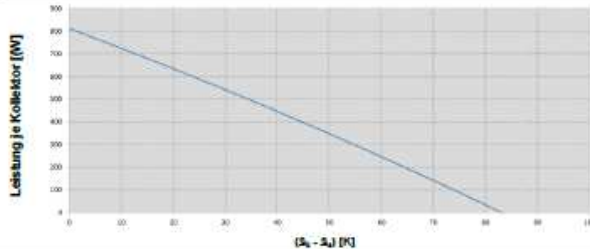
(für $G^* = 800 \text{ W} / m^2$)



$\Delta t_k - \Delta t_a$... Temperaturdifferenz zwischen der mittleren Kollektortemperatur und der Außentemperatur

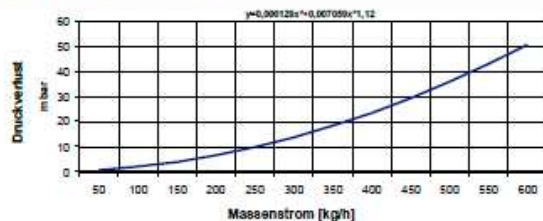
Leistungskennlinie (gemäß EN ISO 9806)

(für $G = 1000 \text{ W} / m^2$) 812 W_p



Druckverlust:

(Wasser-Propylenglykol-Gemisch (60:40), Temperatur 50°C)



Empfohlener Massenstrom:

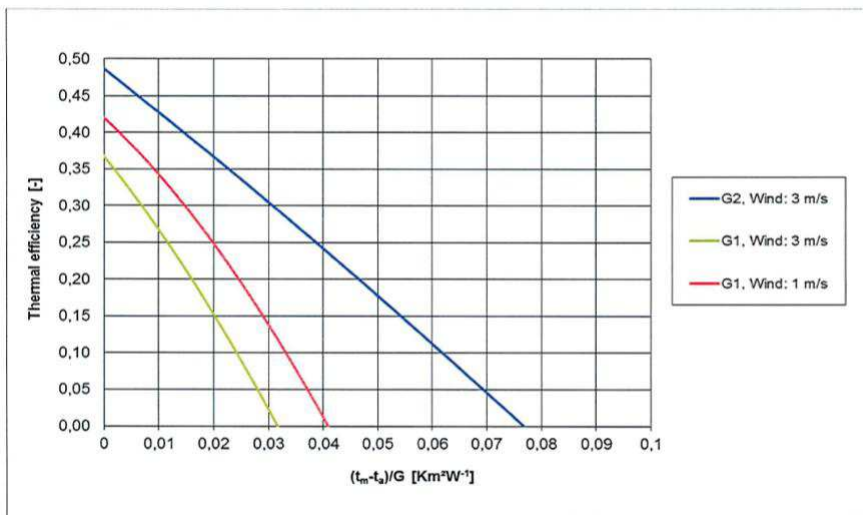
- Warmwasserbereitung → 30 $kg/m^2 \cdot h$ bis 50 $kg/m^2 \cdot h$
- Schwimmbadanwendung → 50 $kg/m^2 \cdot h$

Leistungsdaten: THERMISCH (gemäß EN ISO 9806)

Bezogen auf	Aperturfläche
Prüfbericht-Nummer:	ASiC B-17017-LKT
Konversionsfaktor η_0 :	0,521
Linearer Wärmeverlustkoeffizient a_1 :	5,490 W/m^2K
Quadratischer Wärmeverlustkoeffizient a_2 :	0,0093 W/m^2K^2
Winkelkorrekturfaktor:	0,96
Leistung bei T_0 ($G = 1.000 \text{ W}/m^2$)	812 W_p

5. Vergleich der ermittelten Wirkungsgradkurven

Comparison of the determined efficiency curves



Anmerkung / Note: Die Wirkungsgradkurven beziehen sich auf die Bruttofläche des Kollektors.
The efficiency curves are based on collector gross area.

Photovoltaic



electricity





or

Solar thermal



Heat

20m ²	kWh/a 	kWh/a 
PV (300Wp á Modul)	3.500	
TH (525kWh/m ² /a)		10.500
PV + TH	1.750	5.250
Hybrid (290Wp / 350kWh/m ² /a)	3.400	7.000



Abtaufunktion







- low temperature heating
- warm water
- concrete core activation
- anergy grid
- geothermal / soil regeneration

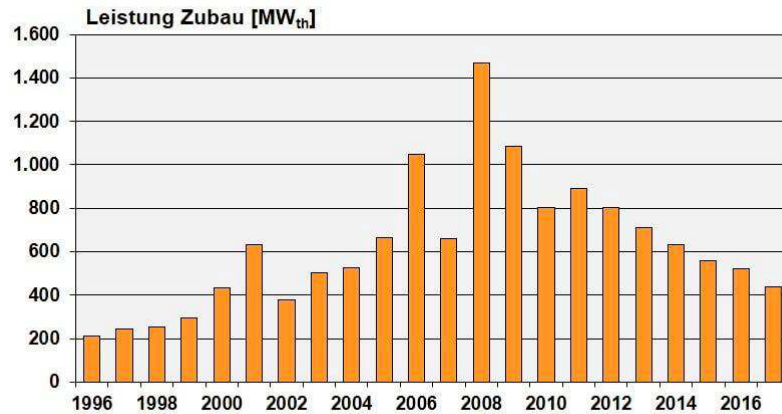
- family houses, residential buildings , housing development
- hottelerie
- sport centers, indoor – outdoor swimmingpools
- camping sites
- small industry (food, agriculture, washing,...)
- communal buildings, dormitories, retirement homes, hospitals
- autarc systems > desalination systems > 5 element house

Market potential:

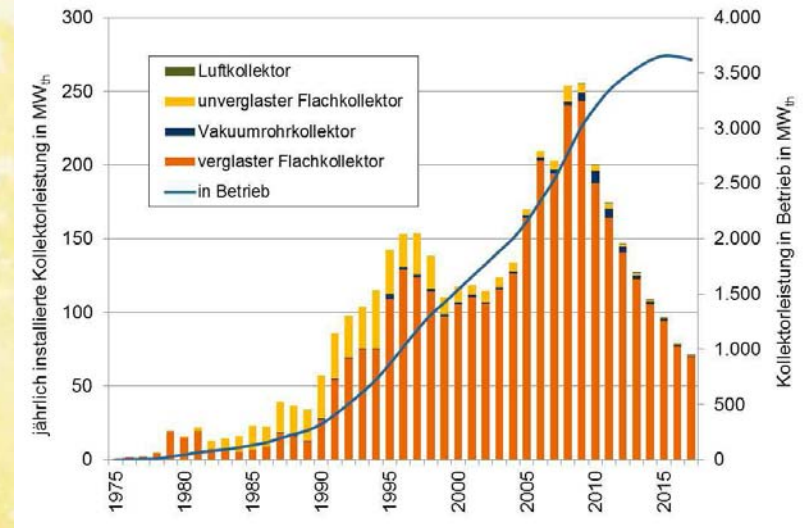
5%: D: TH 28.500 m² 16.765 **118.490 St.**
 1%: D: PV 29.500 kWp 101.725

5%: Ö: TH 3.900 m² 2.295 **9.190 St.**
 1%: Ö: PV 2.000 kWp 6.895

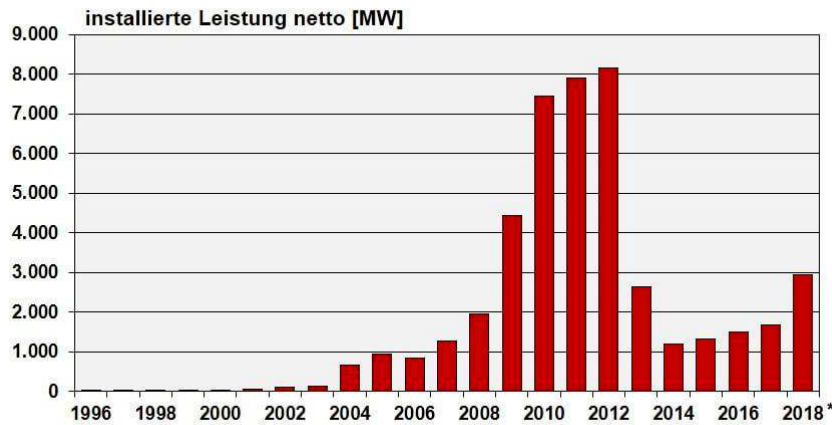
Jährlich installierte Solarthermie-Leistung Deutschland



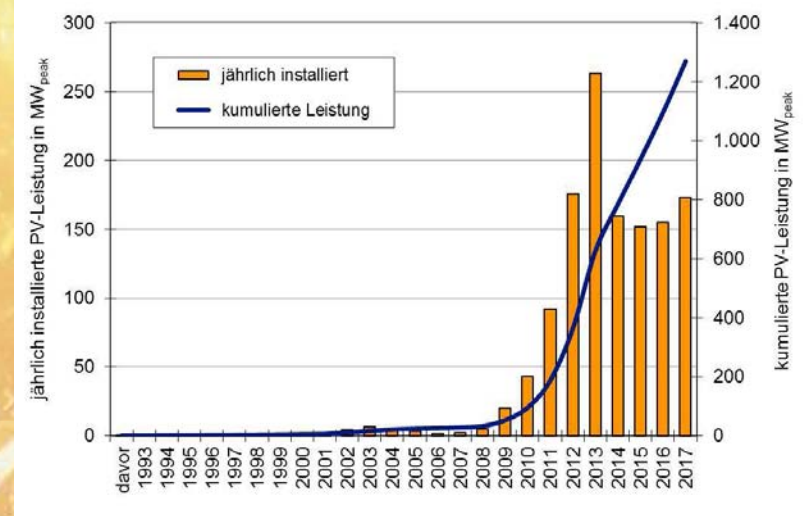
Quelle: IWR, Daten: BSW-Solar, ESTIF, IWR, eigene Berechnung **2018: 570' m²** © IWR, 2018



PV-Markt Deutschland



Quelle: IWR, Daten: IWR, BNetzA, * = vorläufig **2018: 2,95 GWp** © IWR, 2019



Solarize your life

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