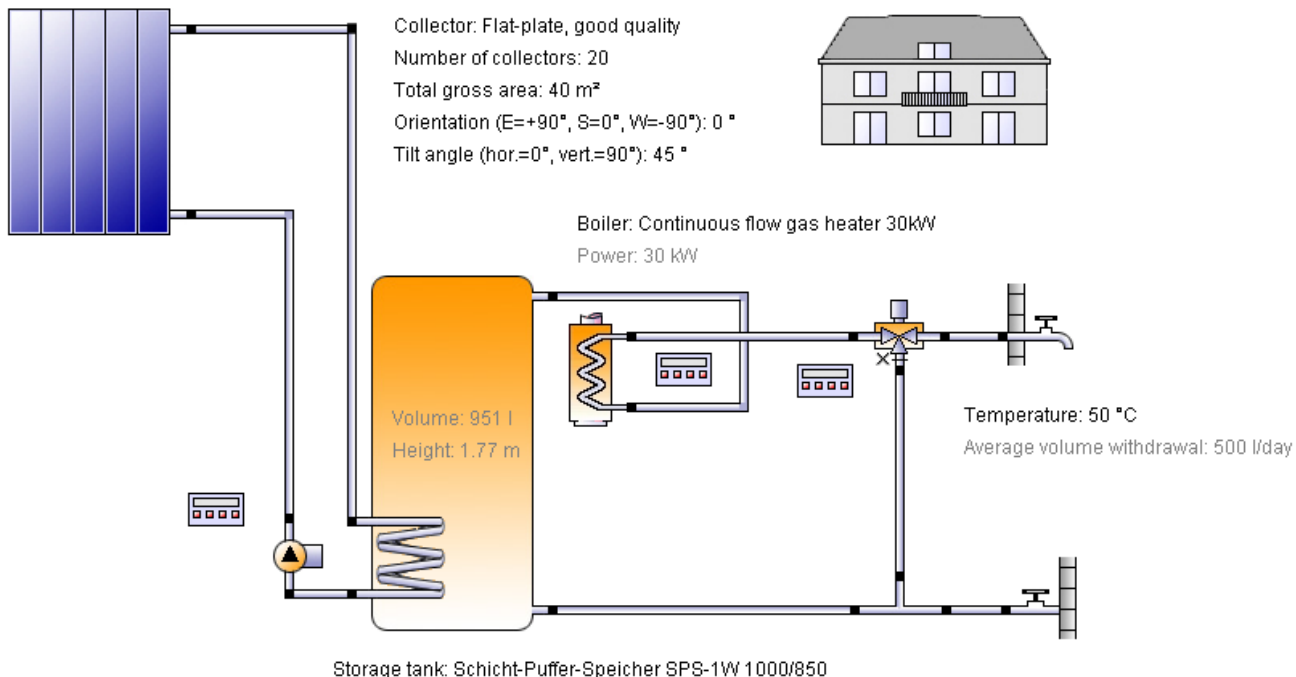


Professional Report

Voorbeeld camping heino

8v: Hot water (solar thermal + modular heat generator)



Location of the system

Heino
Longitude: 6.233°
Latitude: 52.437°
Elevation: 3 m

This report has been created by:

Dennis Dijkman
Dennis Dijkman
De Weerd 10
8141BT Heino
Tel: 0572-367918

System overview (annual values)

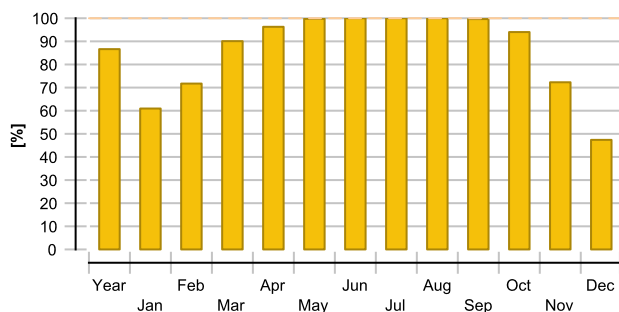
Total fuel and/or electricity consumption of the system [Etot]	1,903.4 kWh
Total energy consumption [Quse]	9,275.8 kWh
System performance [(Quse+Einv) / (Eaux+Epar)]	4.87
Primary energy factor	0.21
Comfort demand	Energy demand covered

Professional Report

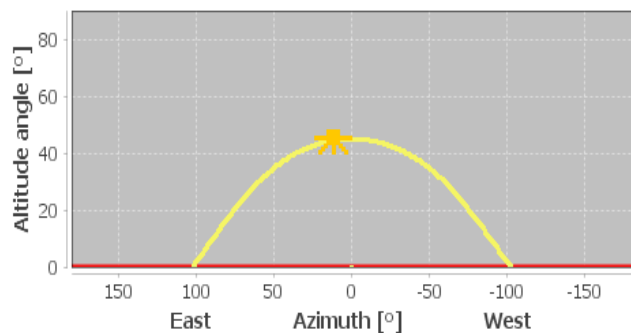
Overview solar thermal energy (annual values)

Collector area	40 m ²
Solar fraction total	86.6%
Total annual field yield	9,013 kWh
Collector field yield relating to gross area	225.3 kWh/m ² /Year
Collector field yield relating to aperture area	250.4 kWh/m ² /Year
Max. fuel savings	1,073 m ³ (gas): [Natural gas H]
Max. energy savings	11,266.3 kWh
Max. reduction in CO2 emissions	2,609.1 kg

Solar fraction: fraction of solar energy to system [SF_n]



Horizon line



Meteorological data-Overview

Average outdoor temperature	10.2 °C
Global irradiation, annual sum	972.8 kWh/m ²
Diffuse irradiation, annual sum	544.4 kWh/m ²

Component overview (annual values)

Boiler Continuous flow gas heater	Continuous flow gas heater 30kW	
Power	kW	30
Total efficiency	%	73.3
Energy from/to the system [Q _{aux}]	kWh	1,390
Fuel and electricity consumption [E _{aux}]	kWh	1,897
Fuel consumption of the back-up boiler [B _{aux}]	m ³ (gas)	180.7
Energy savings solar thermal	kWh	11,266.3
CO2 savings solar thermal	kg	2,609.1
Fuel savings solar thermal	m ³ (gas)	1,073
Exhaust fumes losses [Q _{ex}]	kWh	379.4

Professional Report

Collector Collector field	Flat-plate, good quality	
Data Source		SPF
Number of collectors		20
Number of arrays		1
Total gross area	m ²	40
Total aperture area	m ²	36
Total absorber area	m ²	36
Tilt angle (hor.=0°, vert.=90°)	°	45
Orientation (E=+90°, S=0°, W=-90°)	°	0
Collector field yield [Qsol]	kWh	9,013
Irradiation onto collector area [Esol]	kWh	41,101.1
Collector efficiency [Qsol / Esol]	%	21.9
Direct irradiation after IAM	kWh	20,038.6
Diffuse irradiation after IAM	kWh	18,805.9
Hot water demand	Daily peaks	
Volume withdrawal/daily consumption	l/d	500
Temperature setting	°C	50
Energy demand [Qdem]	kWh	8,435.5
Pump Solar loop	Eco, small	
Circuit pressure drop	bar	45.115
Flow rate	l/h	1,440
Fuel and electricity consumption [Epar]	kWh	6.4
Storage tank Potable water tank	Schicht-Puffer-Speicher SPS-1W 1000/850	
Volume	l	951
Height	m	1.77
Material		Steel
Insulation		Polyester fleece
Thickness of insulation	mm	120
Heat loss [Qhl]	kWh	463.3
Connection losses	kWh	120.6

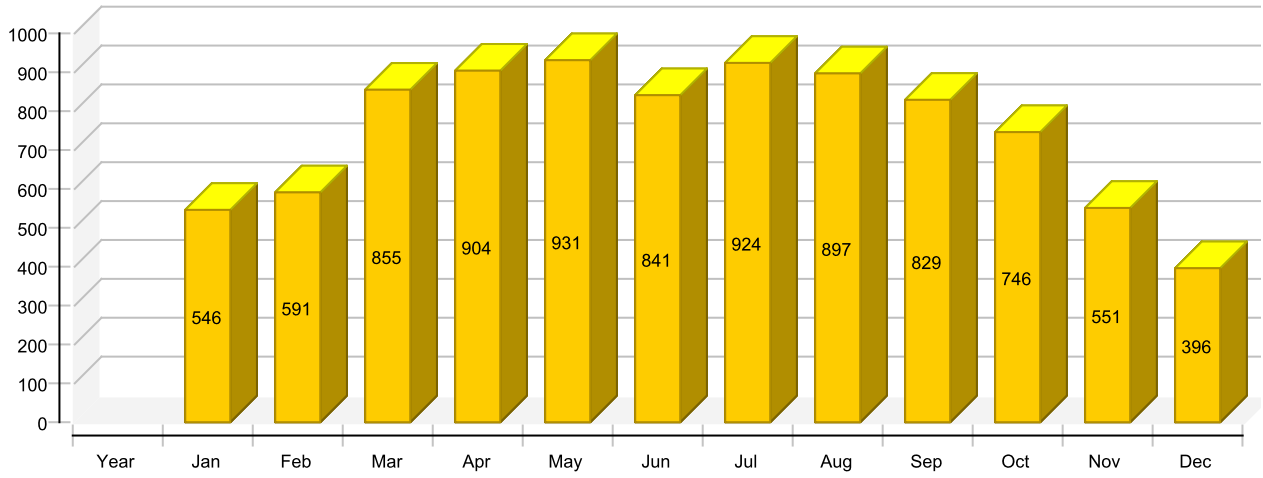
Loop

Solar loop		
Fluid mixture		Propylene mixture
Fluid concentration	%	40
Fluid domains volume	l	54.6
Pressure on top of the circuit	bar	4

Professional Report

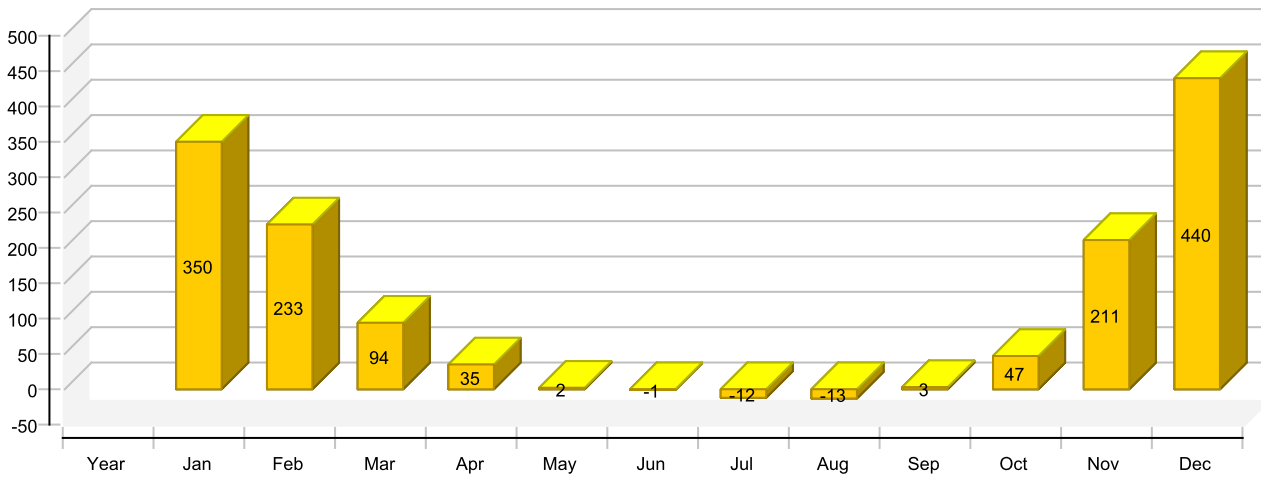
Solar thermal energy to the system [Qsol]

kWh



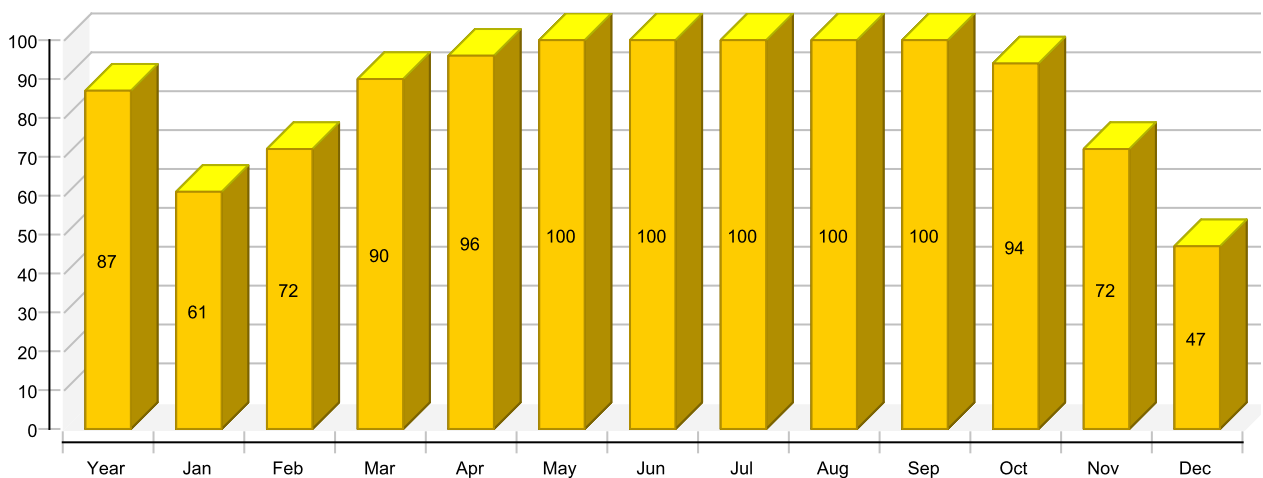
Heat generator energy to the system (solar thermal energy not included) [Qaux]

kWh



Solar fraction: fraction of solar energy to system [SF_n]

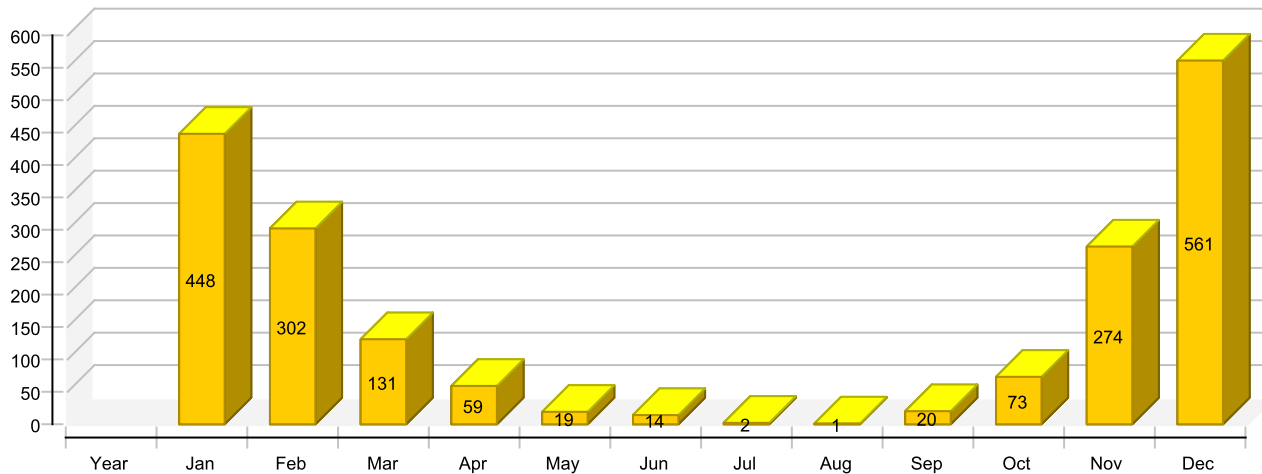
%



Professional Report

Total fuel and/or electricity consumption of the system [Etot]

kWh



Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
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Solar thermal energy to the system [Qsol]

kWh	9013	546	591	855	904	931	841	924	897	829	746	551	396
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Heat generator energy to the system (solar thermal energy not included) [Qaux]

kWh	1390	350	233	94	35	2	-1	-12	-13	3	47	211	440
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Heat generator fuel and electricity consumption [Eaux]

kWh	1897	448	301	131	58	19	14	1	0	19	72	274	560
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Solar fraction: fraction of solar energy to system [SFn]

%	86.6	60.9	71.7	90.1	96.3	99.7	100	100	100	99.6	94	72.3	47.4
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Total fuel and/or electricity consumption of the system [Etot]

kWh	1903	448	302	131	59	19	14	2	1	20	73	274	561
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Irradiation onto collector area [Esol]

kWh	41101	1634	2085	3440	4458	5049	4853	4957	4957	3960	2904	1613	1193
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Electricity consumption of pumps [Epar]

kWh	6.4	0.5	0.5	0.7	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.4
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Total energy consumption [Quse]

kWh	9276	829	769	851	808	802	747	744	730	707	746	738	804
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Heat loss to indoor room (including heat generator losses) [Qint]

kWh	1069	36	47	86	105	125	123	130	138	122	89	43	26
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Heat loss to surroundings (without collector losses) [Qext]

kWh	192	9	11	18	20	22	21	21	22	19	15	8	6
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Professional Report

Collector Collector field Daily maximum temperature [°C]

