Version 7.2.8

PVsyst - Simulation report

Grid-Connected System

Project: Home grid tied(Netherlands)

Variant: New simulation variant

Building system

System power: 4680 Wp

Boshuijzen - Netherlands

Author

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Project summary

Geographical Site
Boshuijzen
Netherlands

Situation

Latitude	51.54 °N
Longitude	5.99 °E
Altitude	36 m
Time zone	UTC+1

Project settings
Albedo 0.20

Meteo data
Boshuijzen
Meteonorm 8.0 (2006-2015), Sat=100% - Synthetic

System summary

Grid-Connected System

Building system

PV Field Orientation
Fixed plane
Tilt/Azimuth 45 / 0 °

Near Shadings
Linear shadings

User's needs
Unlimited load (grid)

System information

PV Array

Nb. of modules	18 units
Pnom total	4680 Wp

Inverters

Nb. of units	1 Unit
Pnom total	4600 W
Pnom ratio	1.017

Results summary

Produced Energy	4872 kWh/year	Specific production	1041 kWh/kWp/year	Perf. Ratio PR	86.79 %

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General parameters

Grid-Connected System

Building system

PV Field Orientation

Orientation	
Fixed plane	
Tilt/Azimuth	45 / 0 °

Sheds configuration

Models used

Transposition	Perez
Diffuse	Perez, Meteonorm
Circumsolar	separate

Horizon
Free Horizon

Near Shadings
Linear shadings

User's needs
Unlimited load (grid)

PV Array Characteristics

PV module

Manufacturer	Trina Solar
Model	TSM-260PEG5
(Original PVsyst database)	
Unit Nom. Power	260 Wp
Number of PV modules	18 units
Nominal (STC)	4680 Wp
Modules	2 Strings x 9 In series
At operating cond. (50°C)	
Pmpp	4198 Wp
U mpp	244 V
I mpp	17 A

Inverter

Manufacturer	Huawei Technologies
Model	SUN2000L-4.6KTL
(Original PVsyst database)	
Unit Nom. Power	4.60 kWac
Number of inverters	2 * MPPT 50% 1 unit
Total power	4.6 kWac
Operating voltage	90-500 V
Max. power (=>40°C)	5.00 kWac
Pnom ratio (DC:AC)	1.02

Total PV power

Nominal (STC)	5 kWp
Total	18 modules
Module area	29.6 m²
Cell area	26.3 m²

Total inverter power

Total power	4.6 kWac
Nb. of inverters	1 Unit
Pnom ratio	1.02

Array losses

Thermal Loss factor
Module temperature according to irradiance

Uc (const)	20.0 W/m²K
Uv (wind)	0.0 W/m²K/m/s

DC wiring losses

Global array res.	238 mΩ
Loss Fraction	1.5 % at STC

Module Quality Loss

Loss Fraction	-0.5 %

Module mismatch losses

Loss Fraction	2.0 % at MPP

Strings Mismatch loss

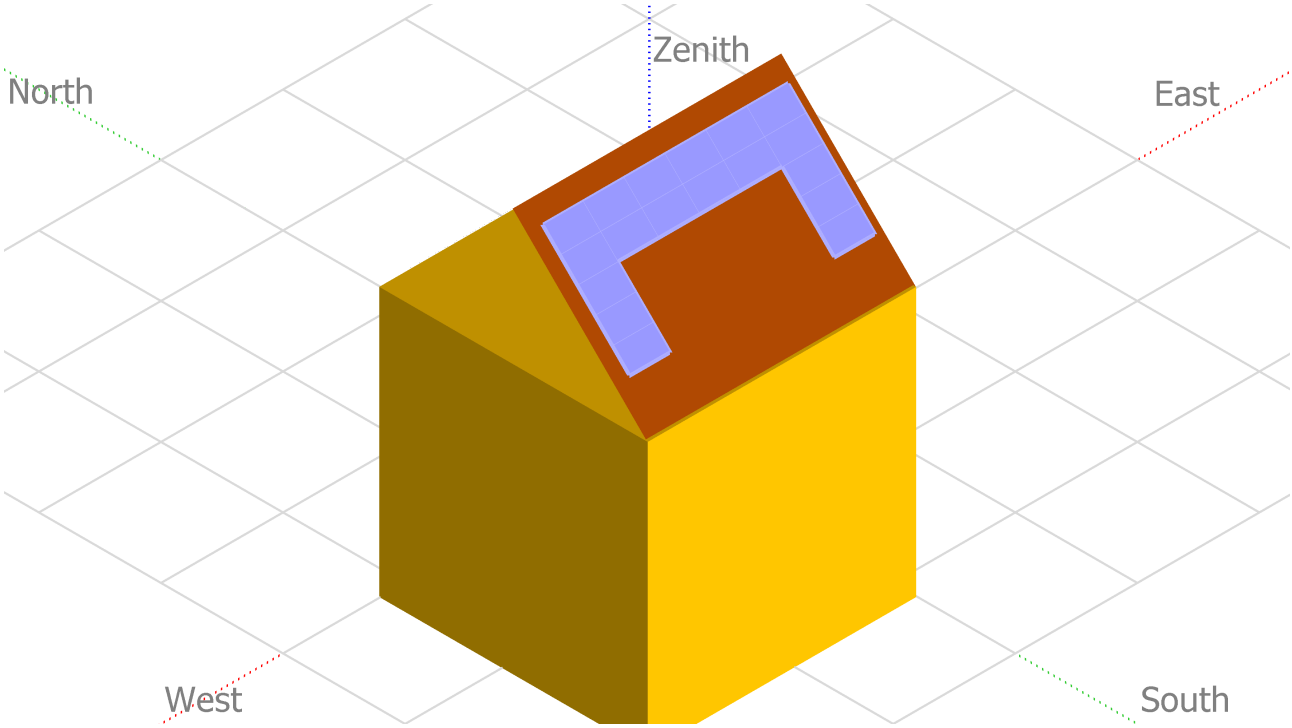
Loss Fraction	0.1 %

IAM loss factor
ASHRAE Param: IAM = 1 - bo(1/cosi -1)

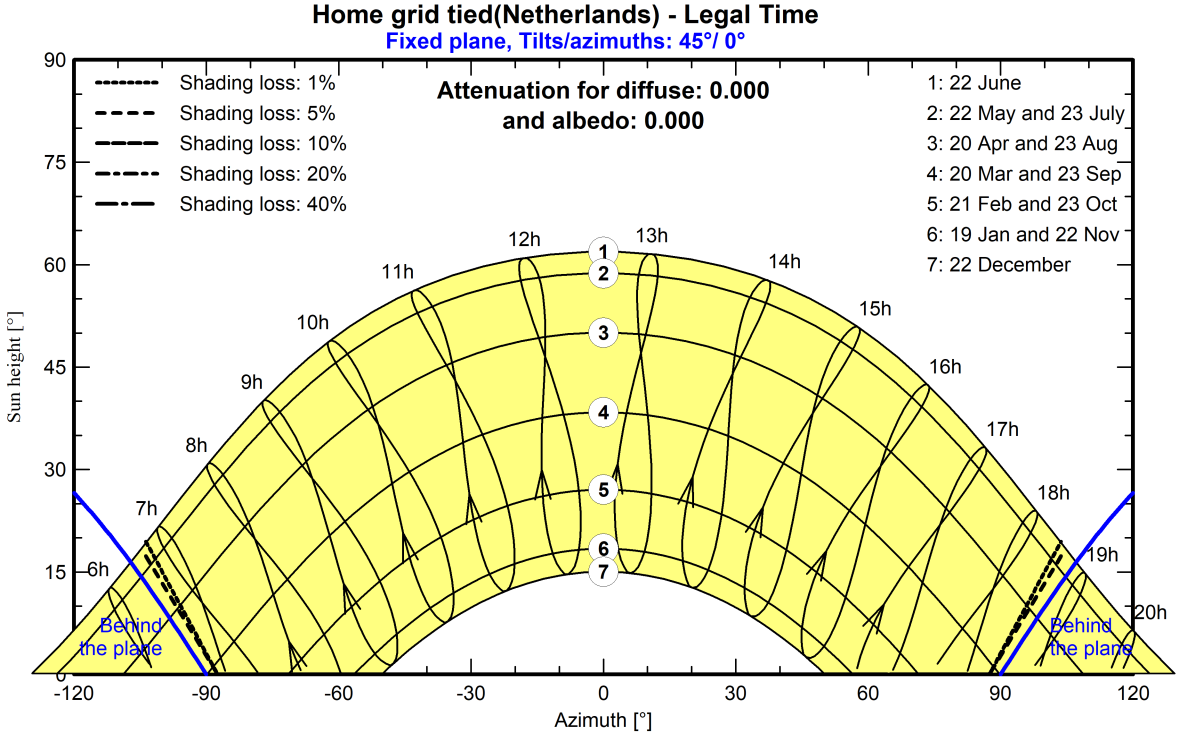
bo Param.	0.05

Near shadings parameter

Perspective of the PV-field and surrounding shading scene



Iso-shadings diagram

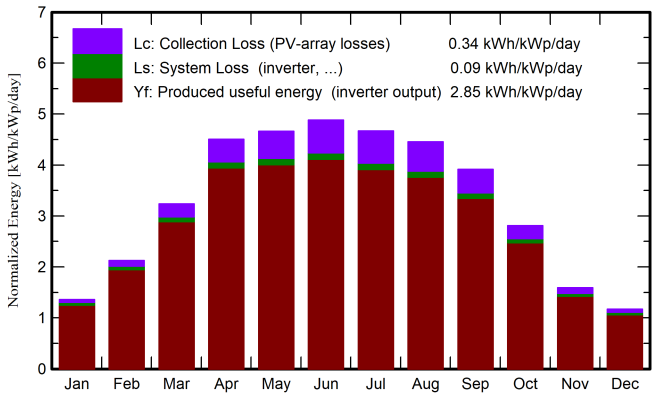


Main results

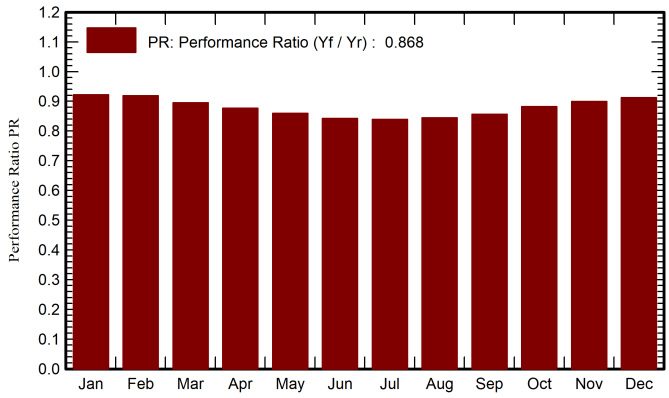
System Production

Produced Energy	4872 kWh/year	Specific production	1041 kWh/kWp/year
		Performance Ratio PR	86.79 %

Normalized productions (per installed kWp)



Performance Ratio PR



Balances and main results

	GlobHor kWh/m²	DiffHor kWh/m²	T_Amb °C	GlobInc kWh/m²	GlobEff kWh/m²	EArray kWh	E_Grid kWh	PR ratio
January	22.3	15.27	3.29	42.2	41.3	189.7	182.2	0.923
February	36.8	22.42	3.54	59.5	58.2	264.8	255.9	0.919
March	75.7	42.30	6.30	100.3	97.9	432.9	419.9	0.895
April	119.4	64.90	10.08	135.1	131.5	570.7	554.5	0.877
May	148.3	84.95	14.13	144.6	140.2	599.6	581.5	0.859
June	158.7	77.99	16.94	146.5	141.7	595.8	577.7	0.843
July	152.4	82.16	19.14	144.8	140.4	586.5	568.3	0.839
August	129.9	73.75	18.29	138.2	134.2	563.1	546.2	0.845
September	91.4	45.58	14.79	117.4	114.6	485.2	470.6	0.857
October	55.0	30.09	11.17	87.1	85.3	371.6	359.6	0.882
November	25.9	16.55	6.84	47.7	46.8	208.9	200.9	0.900
December	16.3	10.35	3.91	36.2	35.5	161.7	154.8	0.913
Year	1032.2	566.30	10.74	1199.5	1167.6	5030.6	4872.2	0.868

Legends

GlobHor	Global horizontal irradiation	EArray	Effective energy at the output of the array
DiffHor	Horizontal diffuse irradiation	E_Grid	Energy injected into grid
T_Amb	Ambient Temperature	PR	Performance Ratio
GlobInc	Global incident in coll. plane		
GlobEff	Effective Global, corr. for IAM and shadings		

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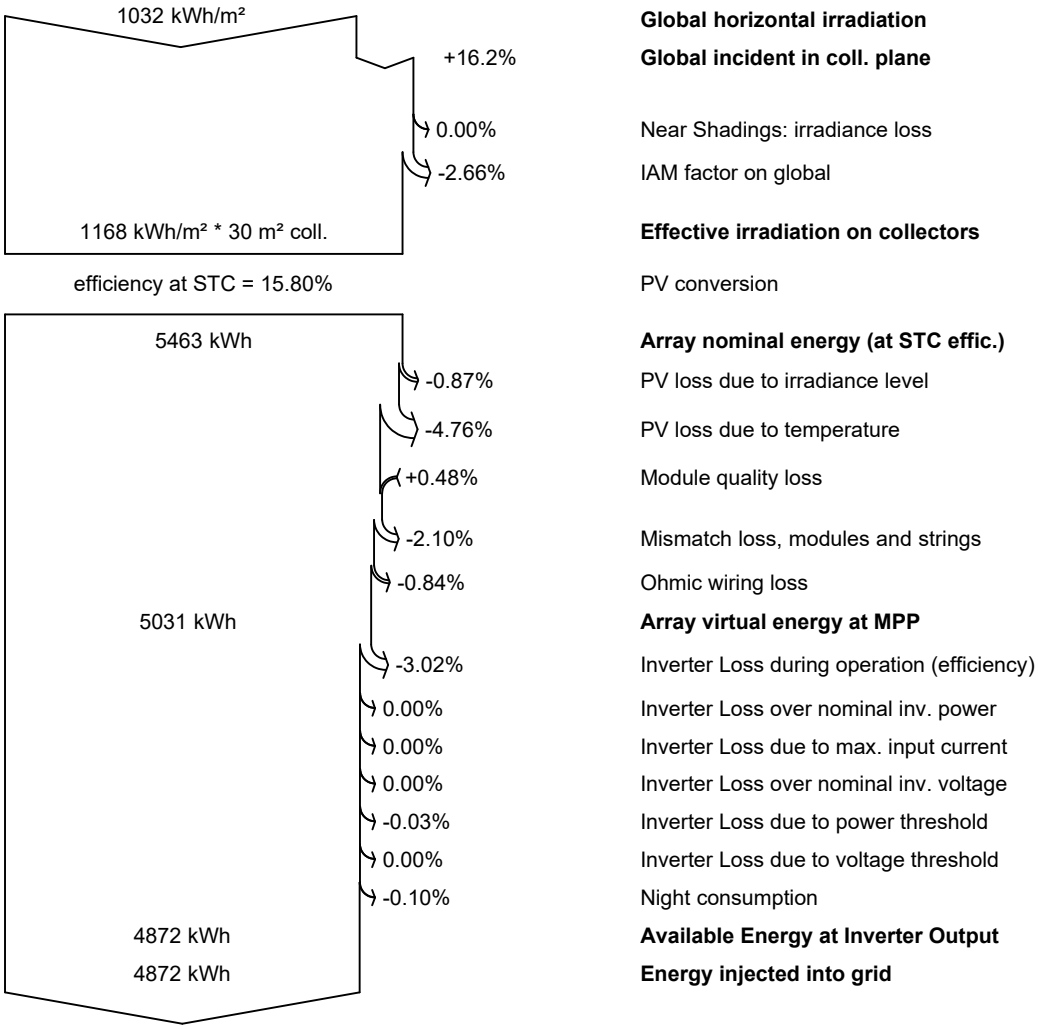
Loss diagram



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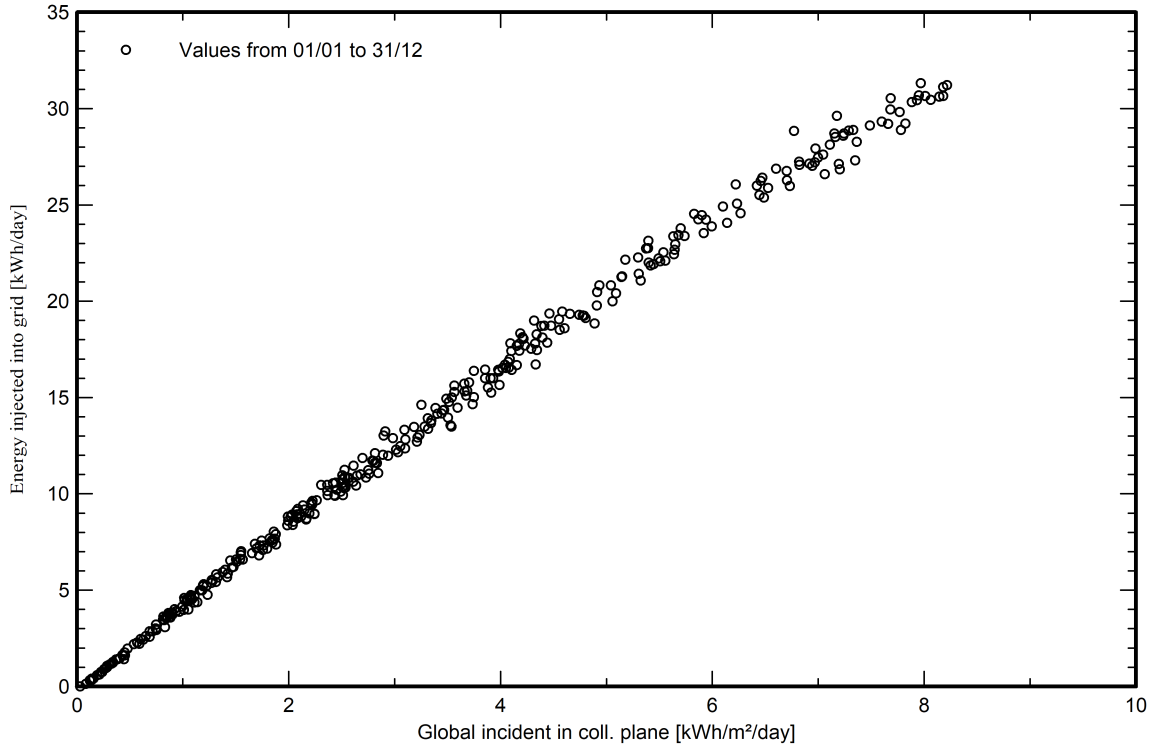
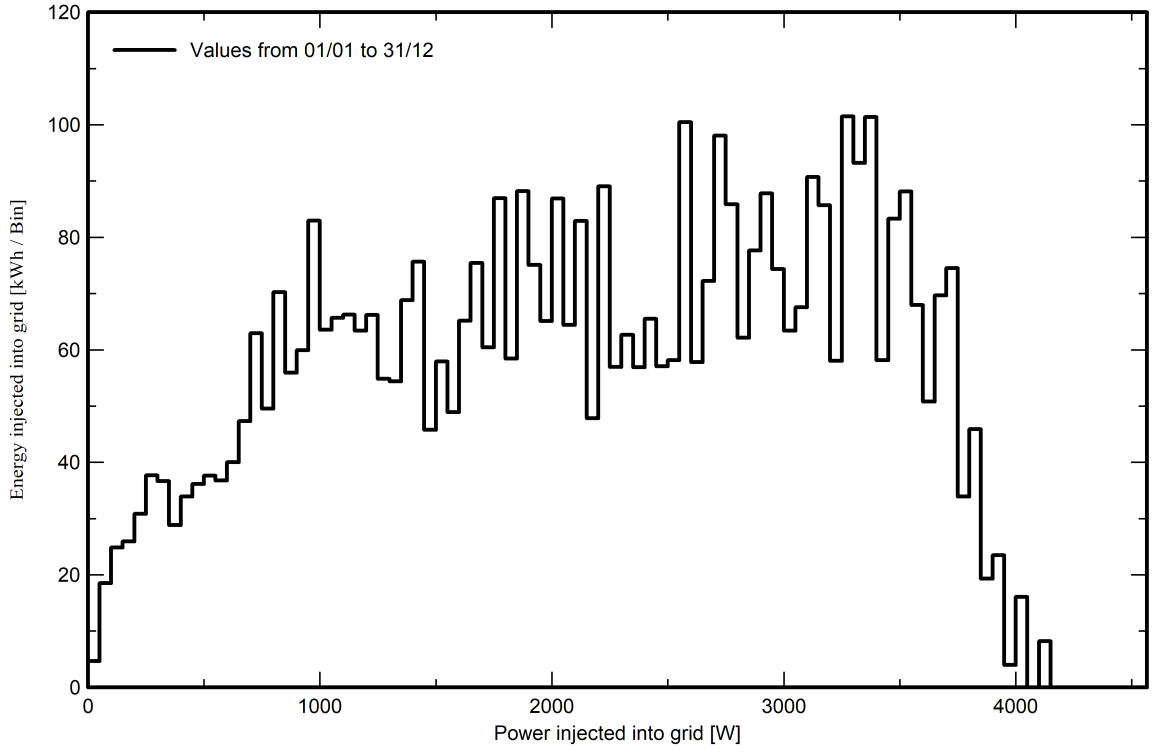
Special graphs

Daily Input/Output diagram



System Output Power Distribution



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P50 - P90 evaluation

Meteo data

Source	Meteonorm 8.0 (2006-2015), Sat=100%
Kind	Not defined
Year-to-year variability(Variance)	0.5 %
Specified Deviation	

Simulation and parameters uncertainties

PV module modelling/parameters	1.0 %
Inverter efficiency uncertainty	0.5 %
Soiling and mismatch uncertainties	1.0 %
Degradation uncertainty	1.0 %

Global variability (meteo + system)

Variability (Quadratic sum)	1.9 %

Annual production probability

Variability	91 kWh
P50	4872 kWh
P90	4755 kWh
P95	4722 kWh

Probability distribution