PVsyst - Simulation report

Grid-Connected System

Project: 5 kw project on grid

Variant: New simulation variant
No 3D scene defined, no shadings
System power: 5.80 kWp
Hall 14 iitk - India

Project summary

Geographical Site
Hall 14 iitk
India

Situation

Latitude	26.51 °N
Longitude	80.23 °E
Altitude	132 m
Time zone	UTC+5.5

Project settings

Albedo	0.20

Meteo data
hall 14 iitk
Meteonorm 8.1 (1996-2015), Sat=100% - Synthetic

System summary

Grid-Connected System

No 3D scene defined, no shadings

PV Field Orientation
Fixed plane
Tilt/Azimuth 26.5 / 0 °

Near Shadings
No Shadings

User's needs
Unlimited load (grid)

System information

PV Array

Nb. of modules	20 units
Pnom total	5.80 kWp

Inverters

Nb. of units	1 unit
Pnom total	4950 W
Pnom ratio	1.172

Results summary

Produced Energy	7963.36 kWh/year	Specific production	1373 kWh/kWp/year	Perf. Ratio PR	81.23 %

Table of contents

Project and results summary 2
General parameters, PV Array Characteristics, System losses 3
Main results 4
Loss diagram 5
Predef. graphs 6
Single-line diagram 7

General parameters

Grid-Connected System — **No 3D scene defined, no shadings**

PV Field Orientation

Orientation		Sheds configuration	Models used	
Fixed plane		No 3D scene defined	Transposition	Perez
Tilt/Azimuth	26.5 / 0 °		Diffuse	Perez, Meteonorm
			Circumsolar	separate

Horizon	Near Shadings	User's needs
Free Horizon	No Shadings	Unlimited load (grid)

PV Array Characteristics

PV module

Manufacturer	Generic
Model	Somera VSM.60.290.05_U
(Original PVsyst database)	
Unit Nom. Power	290 Wp
Number of PV modules	20 units
Nominal (STC)	5.80 kWp
Modules	2 Strings x 10 In series
At operating cond. (50°C)	
Pmpp	5.23 kWp
U mpp	292 V
I mpp	18 A

Inverter

Manufacturer	Generic
Model	SUN2000-4.95KTL-JPL1
(Original PVsyst database)	
Unit Nom. Power	4.95 kWac
Number of inverters	2 * MPPT 50% 1 unit
Total power	5.0 kWac
Operating voltage	90-560 V
Max. power (=>40°C)	5.21 kWac
Pnom ratio (DC:AC)	1.17
No power sharing between MPPTs	

Total PV power

Nominal (STC)	6 kWp
Total	20 modules
Module area	32.5 m²

Total inverter power

Total power	5 kWac
Number of inverters	1 unit
Pnom ratio	1.17

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.	274 mΩ
Loss Fraction	1.5 % at STC

Module Quality Loss

Loss Fraction	-0.8 %

Module mismatch losses

Loss Fraction	2.0 % at MPP

IAM loss factor

Incidence effect (IAM): Fresnel smooth glass, n = 1.526

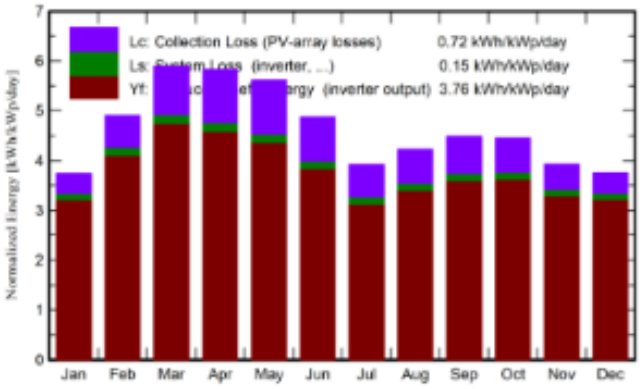
0°	30°	50°	60°	70°	75°	80°	85°	90°
1.000	0.998	0.981	0.948	0.862	0.776	0.636	0.403	0.000

Main results

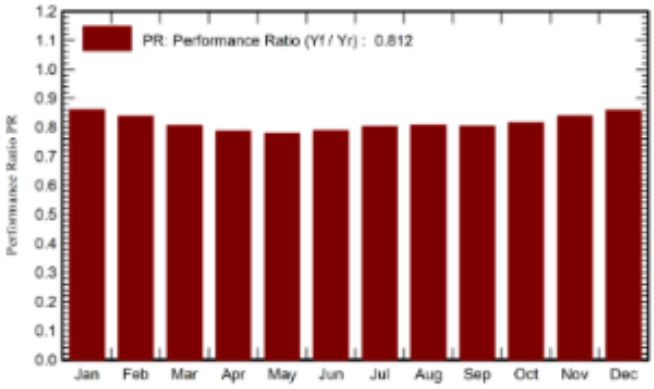
System Production

Produced Energy	7963.36 kWh/year	Specific production	1373 kWh/kWp/year
		Perf. Ratio PR	81.23 %

Normalized productions (per installed kWp)



Performance Ratio PR



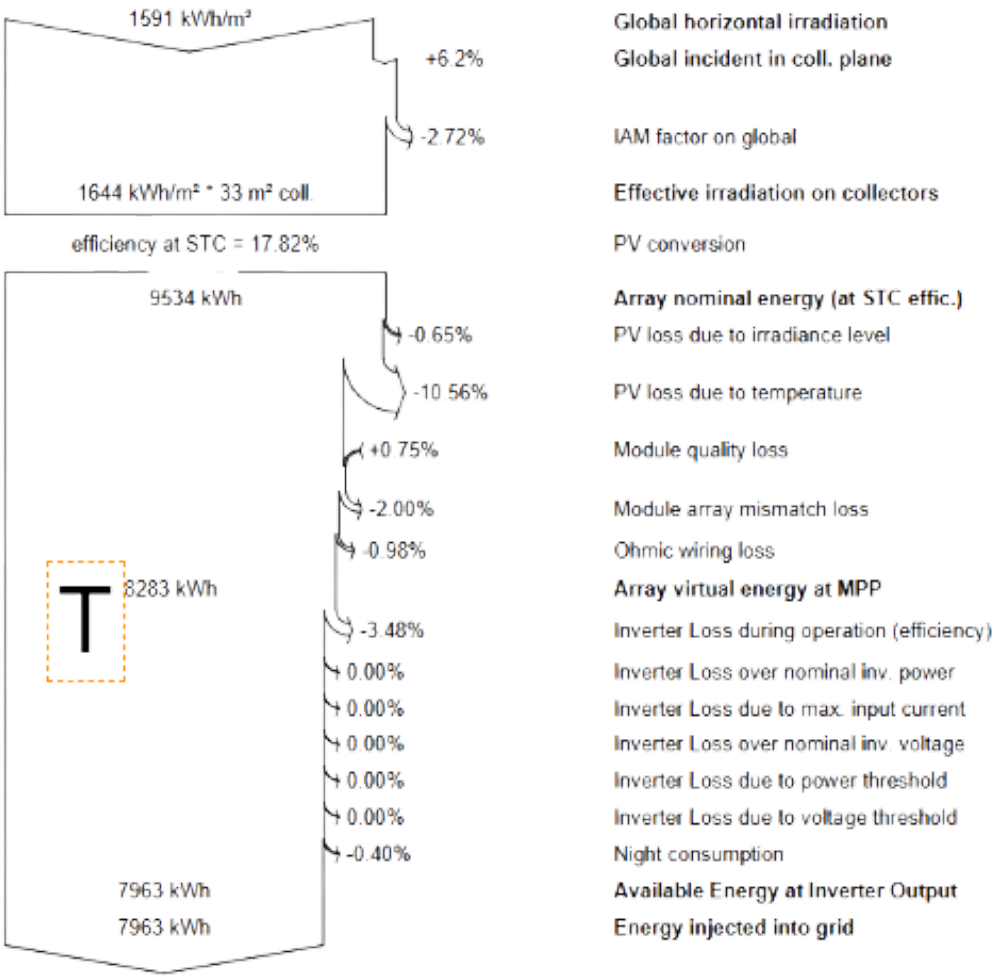
Balances and main results

	GlobHor kWh/m²	DiffHor kWh/m²	T_Amb °C	GlobInc kWh/m²	GlobEff kWh/m²	EArray kWh	E_Grid kWh	PR ratio
January	92.3	51.7	14.11	116.1	113.5	602.9	579.6	0.861
February	113.8	58.1	18.43	137.4	134.3	693.6	667.6	0.838
March	163.5	74.3	24.24	182.7	178.3	887.1	853.8	0.806
April	173.4	89.8	29.84	175.0	170.3	829.7	798.0	0.786
May	185.0	100.6	32.74	174.0	168.8	817.1	785.5	0.778
June	159.5	100.2	32.23	146.1	141.4	695.1	667.9	0.788
July	131.5	90.9	29.99	121.3	117.1	588.4	564.5	0.802
August	135.9	91.4	29.44	131.0	126.8	638.3	613.0	0.807
September	129.1	78.2	28.47	134.6	130.7	652.8	627.0	0.803
October	121.9	75.1	26.25	138.0	134.6	679.2	653.0	0.816
November	95.7	58.5	20.54	117.7	114.8	595.8	572.9	0.839
December	89.8	52.4	15.72	116.5	113.7	603.4	580.4	0.859
Year	1591.3	921.2	25.19	1690.3	1644.3	8283.3	7963.4	0.812

Legends

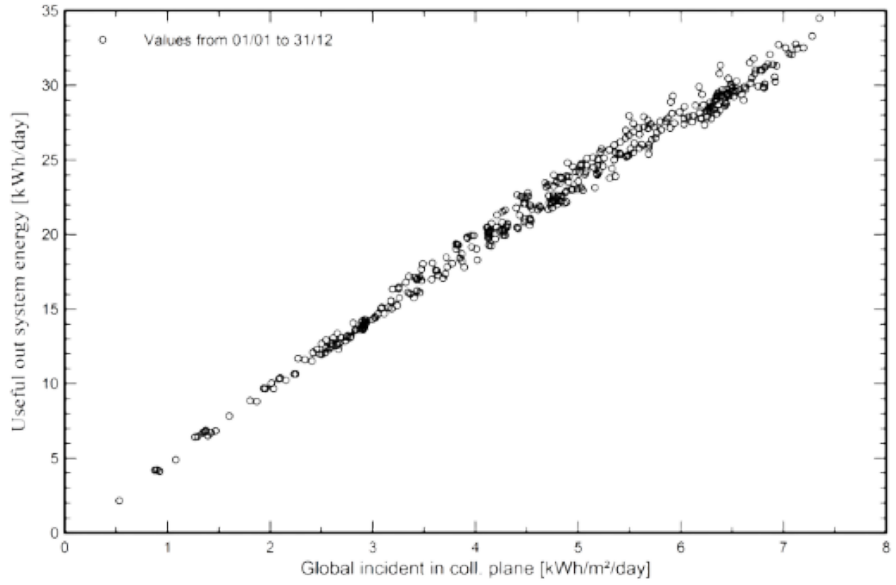
GlobHor	Global horizontal irradiation
DiffHor	Horizontal diffuse irradiation
T_Amb	Ambient Temperature
GlobInc	Global incident in coll. plane
GlobEff	Effective Global, corr. for IAM and shadings
EArray	Effective energy at the output of the array
E_Grid	Energy injected into grid
PR	Performance Ratio

Loss diagram

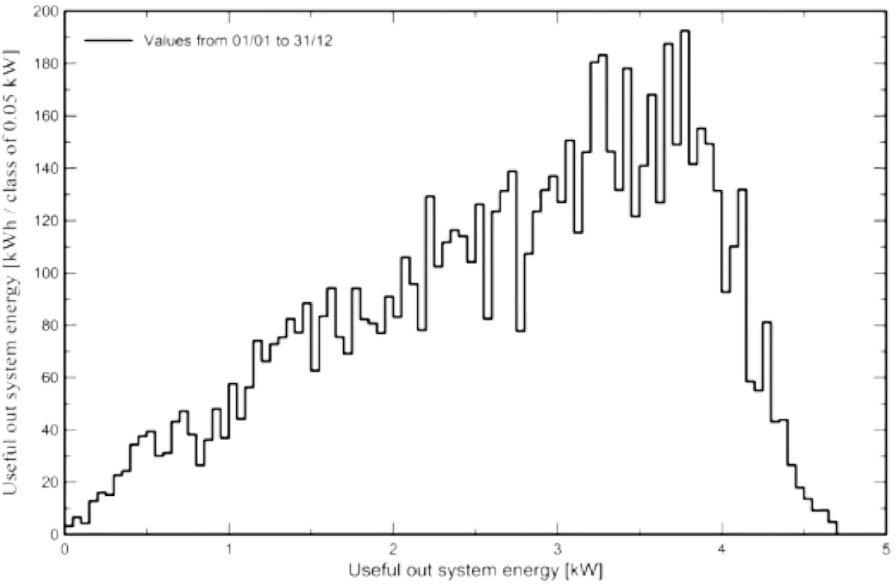
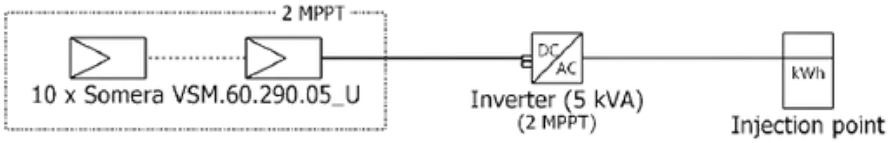


Predef. graphs

Daily Input/Output diagram



System Output Power Distribution



Single Line Diagram