Version 7.2.5

PVsyst - Simulation report

Grid-Connected System

Project: Design on grid solar system of SSVIT bareilly

Variant: Roof top system

3D scene defined, shadings defined

System power: 180 kWp

SSVIT bareilly - India

BY: Abhay & Priyanshu

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Project summary

Geographical Site
SSVIT bareilly
India

Situation

Latitude	28.45 °N
Longitude	79.44 °E
Altitude	268 m
Time zone	UTC+5.5

Project settings

Albedo	0.20

Meteo data
SSVIT bareilly
Meteonorm 8.0 (1981-2010), Sat=100% - Synthetic

System summary

Grid-Connected System — **3D scene defined, shadings defined**

PV Field Orientation
Fixed plane
Tilt/Azimuth 29 / -1 °

Near Shadings
No Shadings

User's needs
Unlimited load (grid)

System information

PV Array

Nb. of modules	450 units
Pnom total	180 kWp

Inverters

Nb. of units	1 Unit
Pnom total	150 kWac
Pnom ratio	1.200

Results summary

Produced Energy	264.0 MWh/year	Specific production	1466 kWh/kWp/year	Perf. Ratio PR	80.86 %

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General parameters

Grid-Connected System — **3D scene defined, shadings defined**

PV Field Orientation

Orientation		Sheds configuration	Models used	
Fixed plane		No 3D scene defined	Transposition	Perez
Tilt/Azimuth	29 / -1 °		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	DXM6-72H-400
(Original PVsyst database)	
Unit Nom. Power	400 Wp
Number of PV modules	450 units
Nominal (STC)	180 kWp
Modules	30 Strings x 15 In series
At operating cond. (50°C)	
Pmpp	162 kWp
U mpp	550 V
I mpp	294 A

Inverter

Manufacturer	Generic
Model	RPS 450-170
(Original PVsyst database)	
Unit Nom. Power	150 kWac
Number of inverters	1 unit
Total power	150 kWac
Operating voltage	425-875 V
Pnom ratio (DC:AC)	1.20

Total PV power

Nominal (STC)	180 kWp
Total	450 modules
Module area	910 m²
Cell area	804 m²

Total inverter power

Total power	150 kWac
Nb. of inverters	1 Unit
Pnom ratio	1.20

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. 31 mΩ
Loss Fraction 1.5 % at STC

Module Quality Loss
Loss Fraction -0.8 %

Module mismatch losses
Loss Fraction 2.0 % at MPP

Strings Mismatch loss
Loss Fraction 0.1 %

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

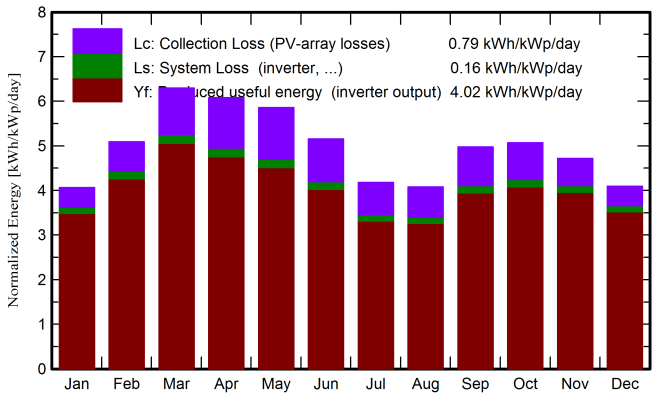
0°	30°	50°	60°	70°	75°	80°	85°	90°
1.000	0.998	0.981	0.948	0.862	0.776	0.636	0.403	0.000

Main results

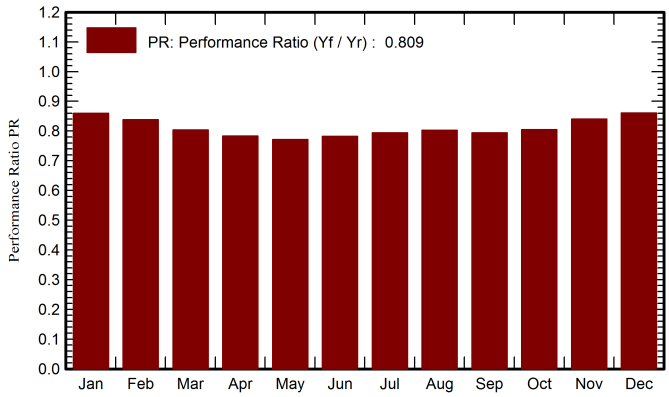
System Production

Produced Energy	264.0 MWh/year	Specific production	1466 kWh/kWp/year
		Performance Ratio PR	80.86 %

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 MWh	E_Grid MWh	PR ratio
January	93.6	44.5	13.51	125.9	123.4	20.28	19.48	0.860
February	114.5	54.7	17.62	142.5	139.6	22.35	21.49	0.838
March	170.3	68.1	23.81	195.3	190.9	29.38	28.25	0.804
April	179.1	85.1	29.53	182.4	177.7	26.76	25.73	0.784
May	193.2	97.5	33.36	181.6	176.3	26.23	25.22	0.772
June	169.6	101.0	32.89	154.6	149.8	22.67	21.77	0.782
July	140.2	92.4	31.31	129.7	125.6	19.33	18.53	0.794
August	131.5	93.0	30.38	126.4	122.2	19.02	18.26	0.802
September	140.8	73.7	28.97	149.3	145.1	22.21	21.35	0.794
October	133.1	69.7	26.55	157.3	154.1	23.72	22.79	0.805
November	107.5	56.3	20.25	141.5	138.5	22.23	21.41	0.840
December	92.2	48.8	15.00	127.0	124.3	20.45	19.67	0.861
Year	1665.7	884.9	25.30	1813.6	1767.5	274.64	263.96	0.809

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

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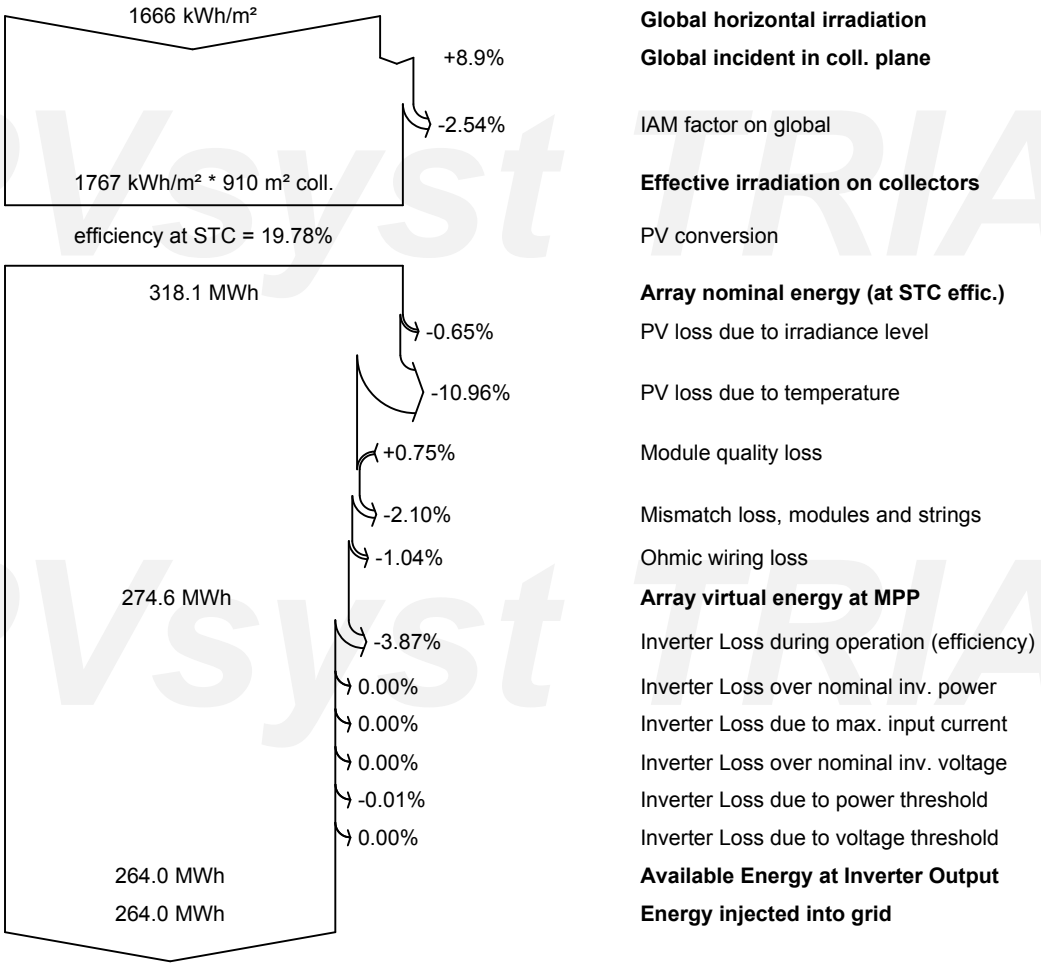
Loss diagram



Global horizontal irradiation
Global incident in coll. plane
IAM factor on global
Effective irradiation on collectors
PV conversion
Array nominal energy (at STC effic.)
PV loss due to irradiance level
PV loss due to temperature
Module quality loss
Mismatch loss, modules and strings
Ohmic wiring loss
Array virtual energy at MPP
Inverter Loss during operation (efficiency)
Inverter Loss over nominal inv. power
Inverter Loss due to max. input current
Inverter Loss over nominal inv. voltage
Inverter Loss due to power threshold
Inverter Loss due to voltage threshold
Available Energy at Inverter Output
Energy injected into grid

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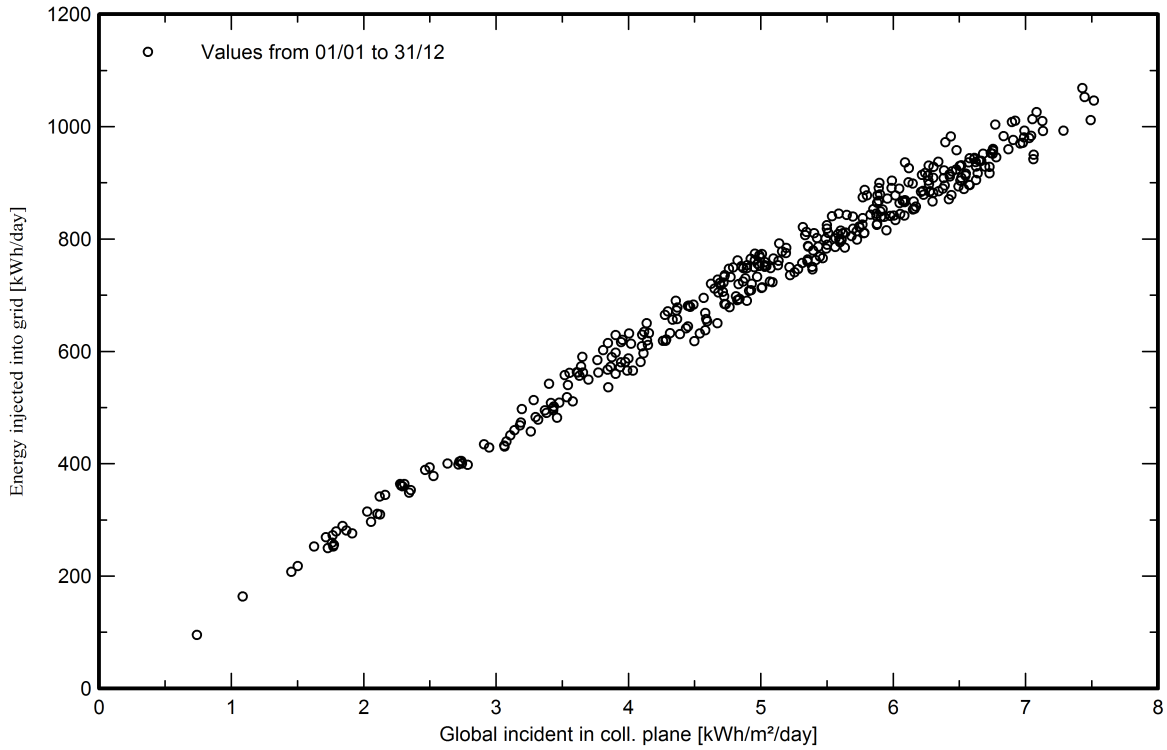
Special graphs

Daily Input/Output diagram



System Output Power Distribution