

PVsyst - Simulation report

Grid-Connected System

Project: 100 Saiyaa Combined Hospital Hardoi

Variant: New simulation variant

Unlimited sheds

System power: 347 kWp

Amlia - India

Author

Jakson Limited (India)



Project: 100 Saiyaa Combined Hospital Hardoi

Variant: New simulation variant

PVsyst V8.0.2

VC0, Simulation date:
25/12/24 08:14
with V8.0.2

Jakson Limited (India)

Project summary

Geographical Site

Amlia

India

Situation

Latitude 25.92 °N

Longitude 83.56 °E

Altitude 74 m

Time zone UTC+5.5

Project settings

Albedo 0.20

Weather data

Amlia

Meteonorm 8.2 (1996-2015), Sat=100% - Synthetic

System summary

Grid-Connected System

Orientation #1

Sheds

Tilt 10 °

Azimuth 32 °

Unlimited sheds

Near Shadings

Mutual shadings of sheds

User's needs

Unlimited load (grid)

System information

PV Array

Nb. of modules

598 units

Pnom total

347 kWp

Inverters

Nb. of units

4 units

Pnom total

300 kWac

Pnom ratio

1.156

Results summary

Produced Energy 493148 kWh/year Specific production 1422 kWh/kWp/year Perf. Ratio PR 91.79 %

Table of contents

Project and results summary	2
General parameters, PV Array Characteristics, System losses	3
Main results	6
Loss diagram	7
Predef. graphs	8
P50 - P90 evaluation	9



PVsyst V8.0.2

VC0, Simulation date:
25/12/24 08:14
with V8.0.2

Jakson Limited (India)

General parameters

Grid-Connected System

Unlimited sheds

Orientation #1

Sheds

Tilt	10 °
Azimuth	32 °

Sheds configuration

Nb. of sheds	10 units
Unlimited sheds	
Shading limit angle	
Limit profile angle	11.7 °

Sizes

Sheds spacing	5.50 m
Collector width	3.00 m
Average GCR	54.5 %
Top inactive band	0.02 m
Bottom inactive band	0.02 m

Models used

Transposition	Perez
Diffuse	Perez, Meteonorm
Circumsolar	separate

Horizon

Free Horizon

Near Shadings

Mutual shadings of sheds

Bifacial system definition

Orientation #1

Bifacial system

Model	Unlimited Sheds 2D Model
-------	--------------------------

Bifacial model geometry

Sheds spacing	5.50 m
Sheds width	3.04 m
Limit profile angle	11.7 °
GCR	55.3 %
Height above ground	1.50 m
Nb. of sheds	10 units

Bifacial model definitions

Ground albedo	0.30
Bifaciality factor	80 %
Rear shading factor	5.0 %
Rear mismatch loss	10.0 %
Shed transparent fraction	0.0 %

User's needs

Unlimited load (grid)

PV Array Characteristics

Array #1 - PV Array

PV module

ManufacturePanasonic Life Solutions India Pvt. Ltd
ModelAE14T580VHC16B5R

(Custom parameters definition)

Unit Nom. Power	580 Wp
Number of PV modules	208 units
Nominal (STC)	121 kWp
Modules	13 string x 16 In series

At operating cond. (50°C)

Pmpp	112 kWp
U mpp	657 V
I mpp	170 A

Inverter

ManufacturerGrowatt New Energy
ModelMAC 50KTL3-X LV

(Custom parameters definition)

Unit Nom. Power	50.0 kWac
Number of inverters	2 units
Total power	100 kWac
Operating voltage	200-1000 V
Pnom ratio (DC:AC)	1.21
Power sharing within this inverter	



PVsyst V8.0.2

VC0, Simulation date:
25/12/24 08:14
with V8.0.2

Jakson Limited (India)

PV Array Characteristics

Array #2 - Sub-array #2

PV module

Manufacturer Panasonic Life Solutions India Pvt. Ltd
Model AE14T580VHC16B5R
(Custom parameters definition)

Unit Nom. Power 580 Wp
Number of PV modules 390 units
Nominal (STC) 226 kWp
Modules 26 string x 15 In series

At operating cond. (50°C)

Pmpp 210 kWp
U mpp 616 V
I mpp 341 A

Total PV power

Nominal (STC) 347 kWp
Total 598 modules
Module area 1543 m²

Inverter

Manufacturer Growatt New Energy
Model MAX 100KTL3-X LV
(Original PVsyst database)

Unit Nom. Power 100 kWac
Number of inverters 2 units
Total power 200 kWac
Operating voltage 180-1000 V
Pnom ratio (DC:AC) 1.13
Power sharing within this inverter

Total inverter power

Total power 300 kWac
Number of inverters 4 units
Pnom ratio 1.16

Array losses

Array Soiling Losses

Loss Fraction 2.0 %

Thermal Loss factor

Module temperature according to irradiance
Uc (const) 29.0 W/m²K
Uv (wind) 0.0 W/m²K/m/s

Serie Diode Loss

Voltage drop 0.7 V
Loss Fraction 0.1 % at STC

LID - Light Induced Degradation

Loss Fraction 0.3 %

Module Quality Loss

Loss Fraction 0.0 %

Module mismatch losses

Array #1 - PV Array

Loss Fraction 1.0 % at MPP

Array #2 - Sub-array #2

Loss Fraction 1.0 % at MPP

IAM loss factor

Incidence effect (IAM): User defined profile

0°	30°	50°	60°	70°	75°	80°	85°	90°
1.000	1.000	0.998	0.992	0.963	0.917	0.812	0.567	0.000

DC wiring losses

Global wiring resistance 10 mΩ
Loss Fraction 1.5 % at STC

Array #1 - PV Array

Global array res. 63 mΩ
Loss Fraction 1.5 % at STC

Array #2 - Sub-array #2

Global array res. 29 mΩ
Loss Fraction 1.5 % at STC

System losses

Unavailability of the system

Time fraction 1.0 %
3.7 days,
3 periods



PVsyst V8.0.2

VC0, Simulation date:
25/12/24 08:14
with V8.0.2

Jakson Limited (India)

AC wiring losses

Inv. output line up to injection point

Inverter voltage	400 Vac tri
Loss Fraction	0.21 % at STC

Inverters: MAC 50KTL3-X LV, MAX 100KTL3-X LV

Wire section (4 Inv.)	Alu 4 x 3 x 95 mm ²
Average wires length	25 m



Project: 100 Saiyaa Combined Hospital Hardoi

Variant: New simulation variant

PVsyst V8.0.2

VC0, Simulation date:
25/12/24 08:14
with V8.0.2

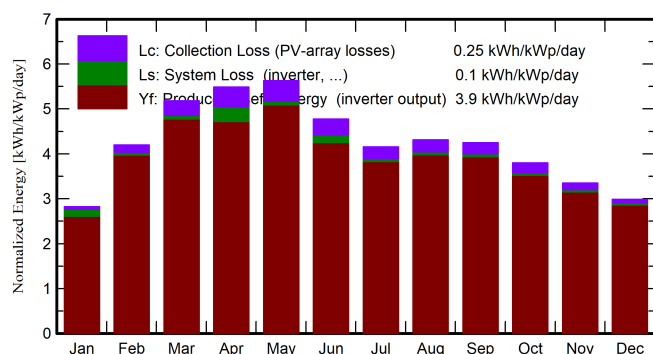
Jakson Limited (India)

Main results

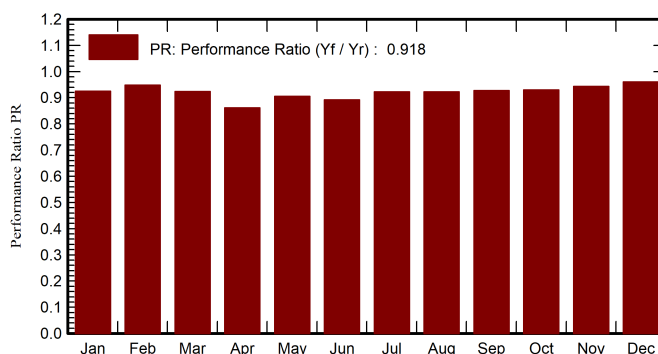
System Production

Produced Energy (P50)	493148 kWh/year	Specific production (P50)	1422 kWh/kWp/year	Perf. Ratio PR	91.79 %
Produced Energy (P90)	481748 kWh/year	Specific production (P90)	1389 kWh/kWp/year		
Produced Energy (P75)	487155 kWh/year	Specific production (P75)	1405 kWh/kWp/year		

Normalized productions (per installed kWp)



Performance Ratio PR



Balances and main results

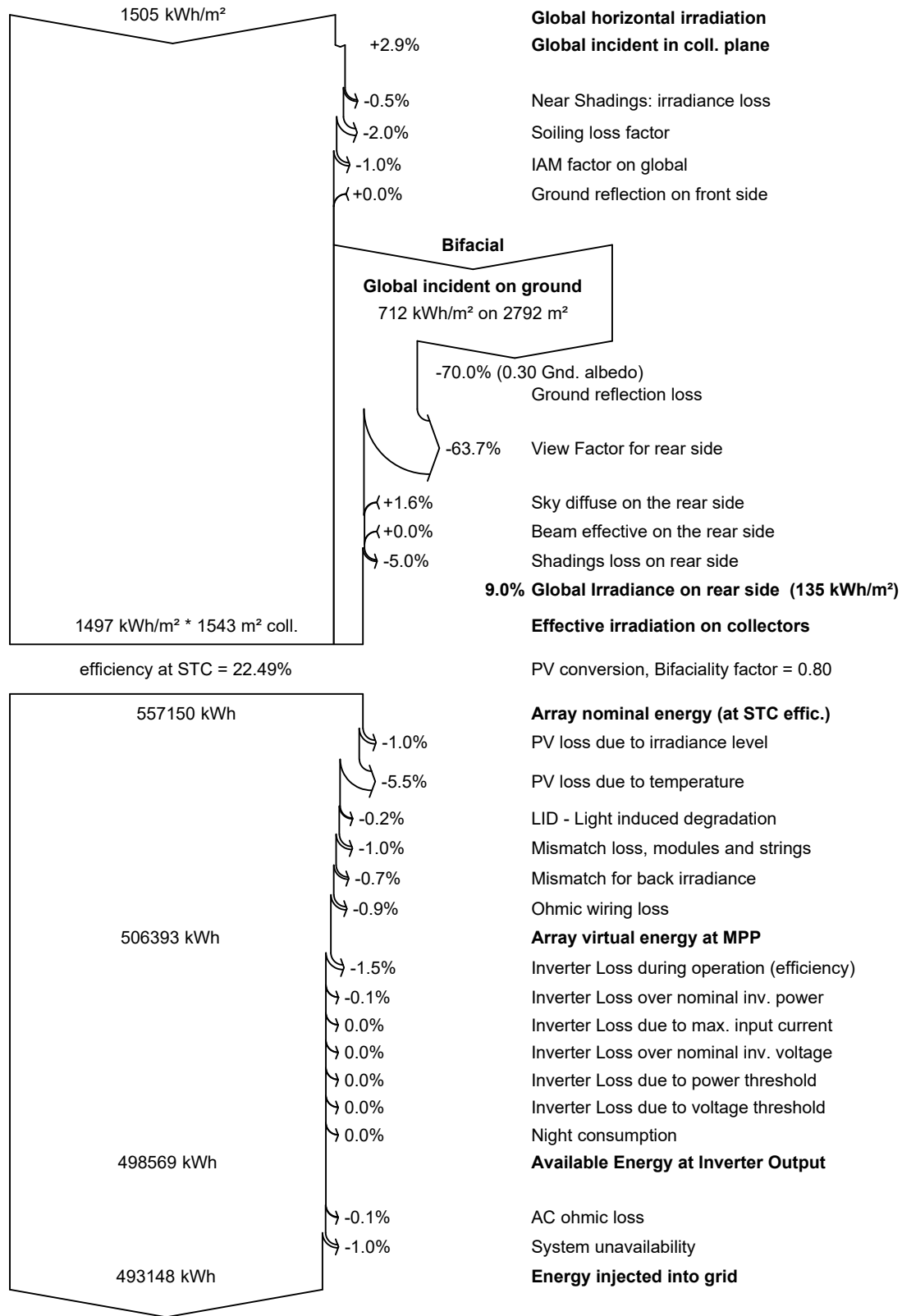
	GlobHor	DiffHor	T_Amb	GlobInc	GlobEff	EArray	E_Grid	PR
	kWh/m ²	kWh/m ²	°C	kWh/m ²	kWh/m ²	kWh	kWh	ratio
January	80.8	50.9	15.14	87.6	84.5	29787	28099	0.924
February	109.3	59.1	19.58	117.6	113.8	39259	38642	0.948
March	152.9	76.4	25.35	160.6	155.6	52267	51438	0.923
April	162.4	88.5	30.20	164.7	159.4	52678	49175	0.861
May	176.1	101.9	32.57	174.6	169.1	55705	54824	0.905
June	145.1	97.0	31.86	143.2	138.3	46032	44272	0.892
July	131.7	88.2	30.04	128.8	124.3	41900	41198	0.922
August	133.1	90.8	29.62	133.8	129.1	43508	42817	0.923
September	124.5	84.0	28.74	127.5	123.1	41678	41027	0.927
October	112.0	73.2	26.80	117.7	113.7	38582	37969	0.930
November	92.5	58.5	21.60	100.4	96.8	33396	32860	0.943
December	84.3	54.3	16.84	92.6	89.2	31325	30827	0.960
Year	1504.7	922.8	25.72	1549.1	1496.8	506117	493148	0.918

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		



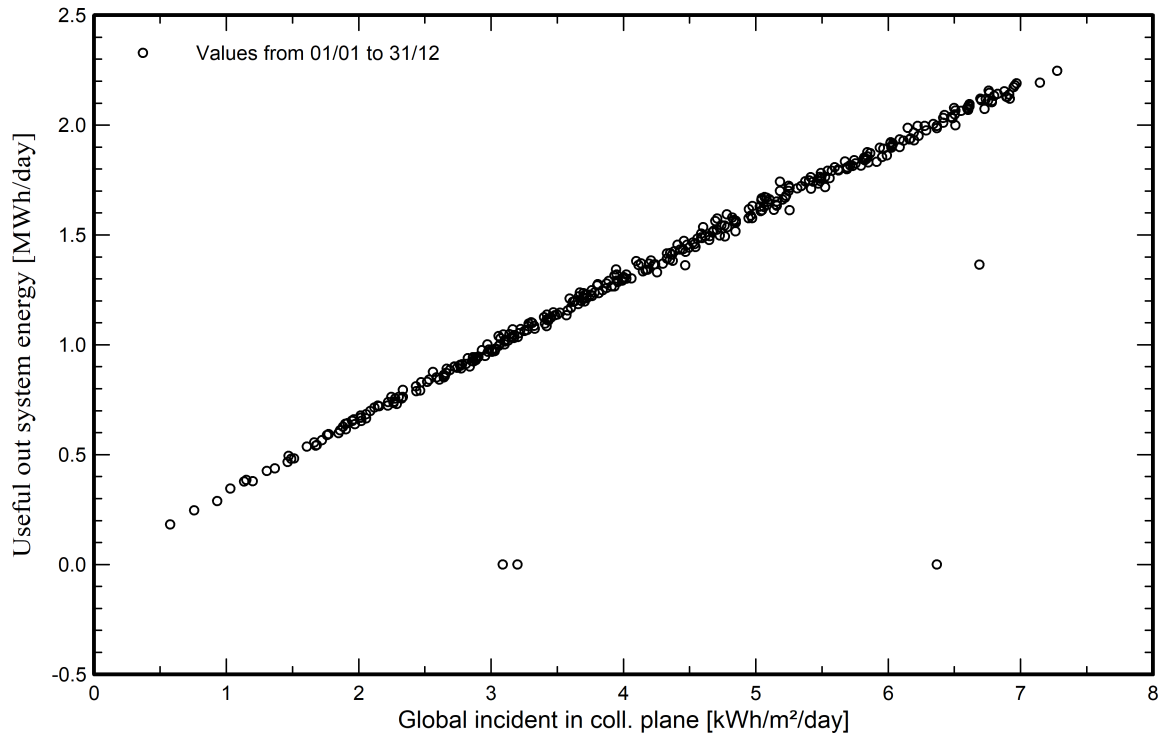
Loss diagram



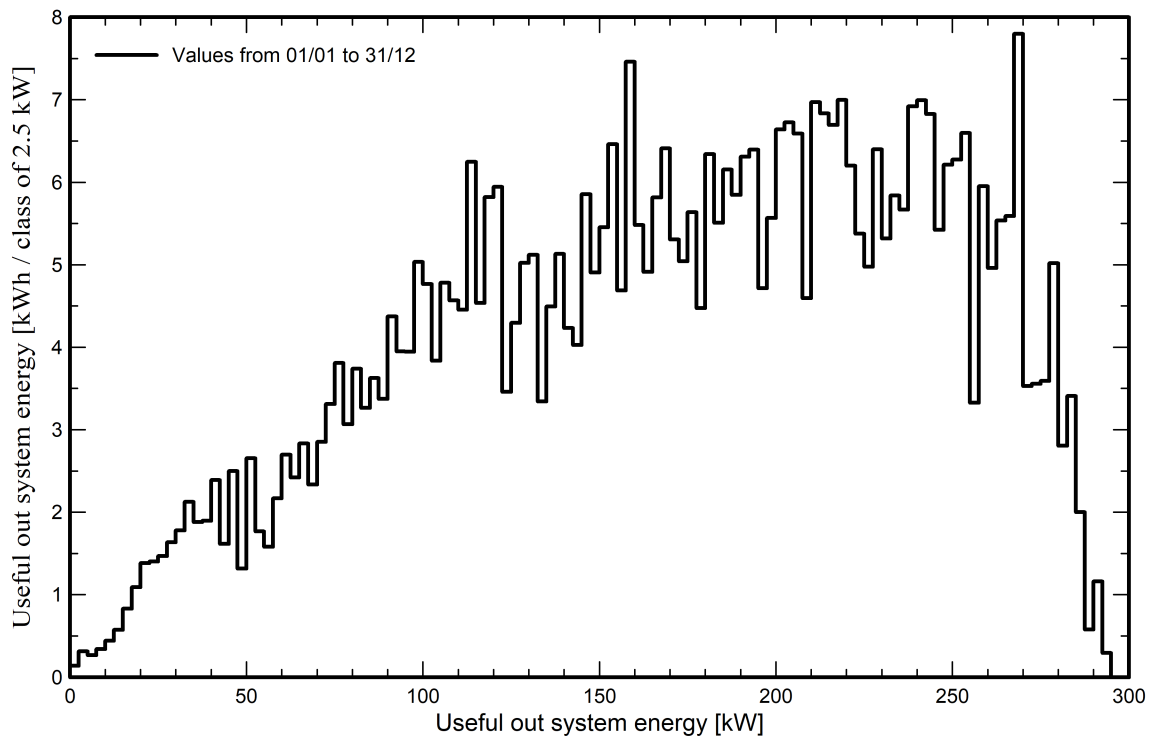


Predef. graphs

Daily Input/Output diagram



System Output Power Distribution





P50 - P90 evaluation

Weather data

Source Meteonorm 8.2 (1996-2015), Sat=100%
Kind Not defined
Year-to-year variability(Variance) 0.0 %

Specified Deviation

Global variability (weather data + system)

Variability (Quadratic sum) 1.8 %

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 %

Annual production probability

Variability 8.9 MWh
P50 493.1 MWh
P90 481.7 MWh
P75 487.2 MWh

Probability distribution

