

PVsyst - Simulation report

Grid-Connected System

Project: 51MWp_Mithi iPaldi

Variant: New simulation variant

Sheds system, seasonal tilt

System power: 51.01 MWp

Mithi Paldi - India

**PVsyst V7.4.8**

VC0, Simulation date:
20/08/24 19:45
with V7.4.8

Project summary**Geographical Site****Mithi Paldi**

India

Situation

Latitude 24.22 °N

Longitude 71.73 °E

Altitude 58 m

Time zone UTC+5.5

Project settings

Albedo 0.20

Weather data

Mithi Paldi

Meteonorm 8.1 (1996-2015), Sat=100% - Synthetic

System summary**Grid-Connected System****PV Field Orientation**

Seasonal tilt adjustment

azimuth 0 °

Summer Tilt 5 °

winter 22 °

Oct.-Nov.-Dec.-Jan.-Feb.-

Sheds system, seasonal tilt**Near Shadings**

No Shadings

User's needs

Unlimited load (grid)

System information**PV Array**

Nb. of modules

92742 units

Pnom total

51.01 MWp

Inverters

Nb. of units

125 units

Pnom total

43.75 MWac

Pnom ratio

1.166

Results summary

Produced Energy 84602067 kWh/year

Specific production

1659 kWh/kWp/year

Perf. Ratio PR

82.41 %

Table of contents

Project and results summary	2
General parameters, PV Array Characteristics, System losses	3
Main results	5
Loss diagram	6
Predef. graphs	7
Single-line diagram	8

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General parameters**Grid-Connected System****Sheds system, seasonal tilt****PV Field Orientation****Orientation**

Seasonal tilt adjustment
azimuth 0 °
Summer Tilt 5 °
winter 22 °
Oct.-Nov.-Dec.-Jan.-Feb.-

Sheds configuration

No 3D scene defined

Models used

Transposition Perez
Diffuse Perez, Meteonorm
Circumsolar separate

Horizon

Free Horizon

Near Shadings

No Shadings

User's needs

Unlimited load (grid)

PV Array Characteristics**PV module**

Manufacturer Waaree
Model Bi-55-550
(Custom parameters definition)

Unit Nom. Power 550 Wp
Number of PV modules 92742 units
Nominal (STC) 51.01 MWp
Modules 3567 string x 26 In series

At operating cond. (50°C)

Pmpp 47.10 MWp
U mpp 992 V
I mpp 47467 A

Total PV power

Nominal (STC) 51008 kWp
Total 92742 modules
Module area 238734 m²
Cell area 221156 m²

Inverter

Manufacturer Sungrow
Model SG350-HX
(Original PVsyst database)

Unit Nom. Power 350 kWac
Number of inverters 125 units
Total power 43750 kWac
Operating voltage 500-1450 V
Pnom ratio (DC:AC) 1.17
Power sharing within this inverter

Total inverter power

Total power 43750 kWac
Number of inverters 125 units
Pnom ratio 1.17

Array losses**Array Soiling Losses**

Average loss Fraction 2.0 %

Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%

Thermal Loss factor

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

DC wiring losses

Global array res. 0.11 mΩ
Loss Fraction 0.5 % at STC

LID - Light Induced Degradation

Loss Fraction 2.0 %

Module Quality Loss

Loss Fraction 0.0 %

Module mismatch losses

Loss Fraction 1.0 % at MPP

Strings Mismatch loss

Loss Fraction 0.1 %

IAM loss factor

Incidence effect (IAM): User defined profile

0°	30°	50°	60°	70°	75°	80°	85°	90°
1.000	0.999	0.985	0.958	0.886	0.809	0.676	0.449	0.000



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System losses

Unavailability of the system

Time fraction 1.0 %
3.7 days,
3 periods

Auxiliaries loss

Proportional to Power 3.0 W/kW
0.0 kW from Power thresh.

AC wiring losses

Inv. output line up to injection point

Inverter voltage 800 Vac tri
Loss Fraction 1.50 % at STC

Inverter: SG350-HX

Wire section (125 Inv.) Copper 125 x 3 x 150 mm²
Average wires length 189 m



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Main results

System Production

Produced Energy

84602067 kWh/year

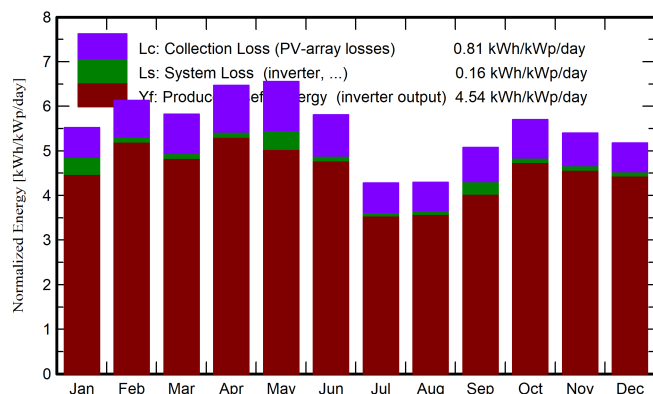
Specific production

1659 kWh/kWp/year

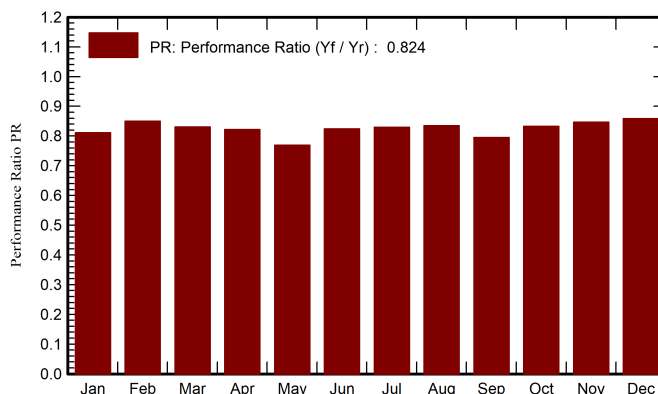
Perf. Ratio PR

82.41 %

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	130.2	44.5	18.96	171.3	164.7	7683454	7087034	0.811
February	140.9	47.5	22.34	171.7	165.4	7604016	7440186	0.850
March	174.7	70.9	27.94	180.6	172.9	7819272	7652855	0.831
April	191.4	83.1	31.54	194.0	186.1	8307998	8132425	0.822
May	203.5	97.7	34.09	203.3	194.9	8636925	7975478	0.769
June	175.5	102.8	32.49	174.3	166.9	7480000	7323872	0.824
July	133.3	91.8	30.14	132.7	126.4	5734344	5610116	0.829
August	132.9	94.3	28.85	133.2	126.7	5789587	5668724	0.834
September	149.0	76.7	28.99	152.3	145.4	6608854	6175205	0.795
October	153.1	69.9	29.08	176.7	169.7	7661751	7503469	0.833
November	128.7	51.1	24.45	162.1	156.2	7155013	7002438	0.847
December	120.8	41.9	20.33	160.5	154.8	7182621	7030263	0.859
Year	1834.0	872.3	27.45	2012.6	1930.2	87663836	84602067	0.824

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

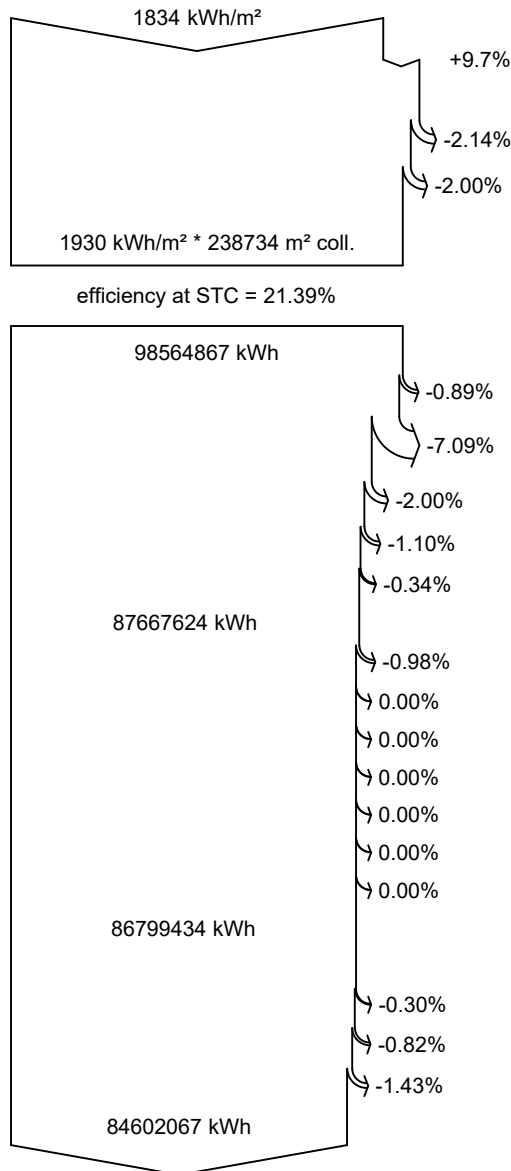
PR Performance Ratio



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Loss diagram



Global horizontal irradiation

Global incident in coll. plane

IAM factor on global

Soiling loss factor

Effective irradiation on collectors

PV conversion

Array nominal energy (at STC effic.)

PV loss due to irradiance level

PV loss due to temperature

LID - Light induced degradation

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

Night consumption

Available Energy at Inverter Output

Auxiliaries (fans, other)

AC ohmic loss

System unavailability

Energy injected into grid

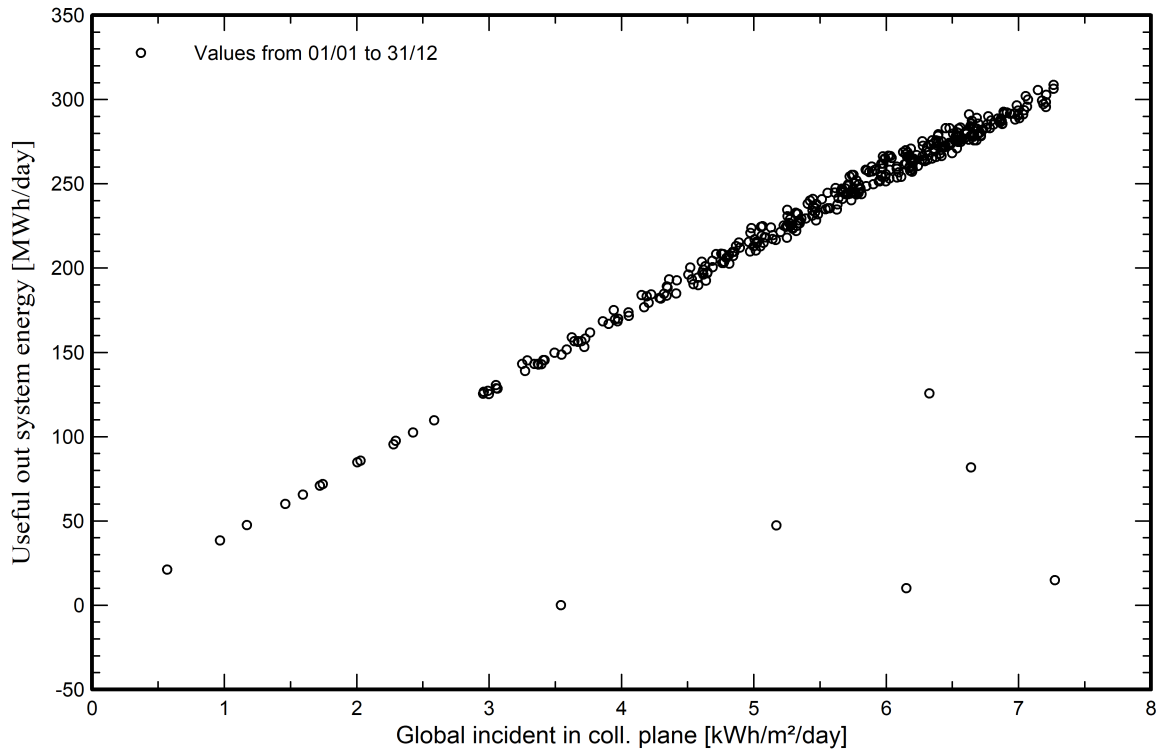


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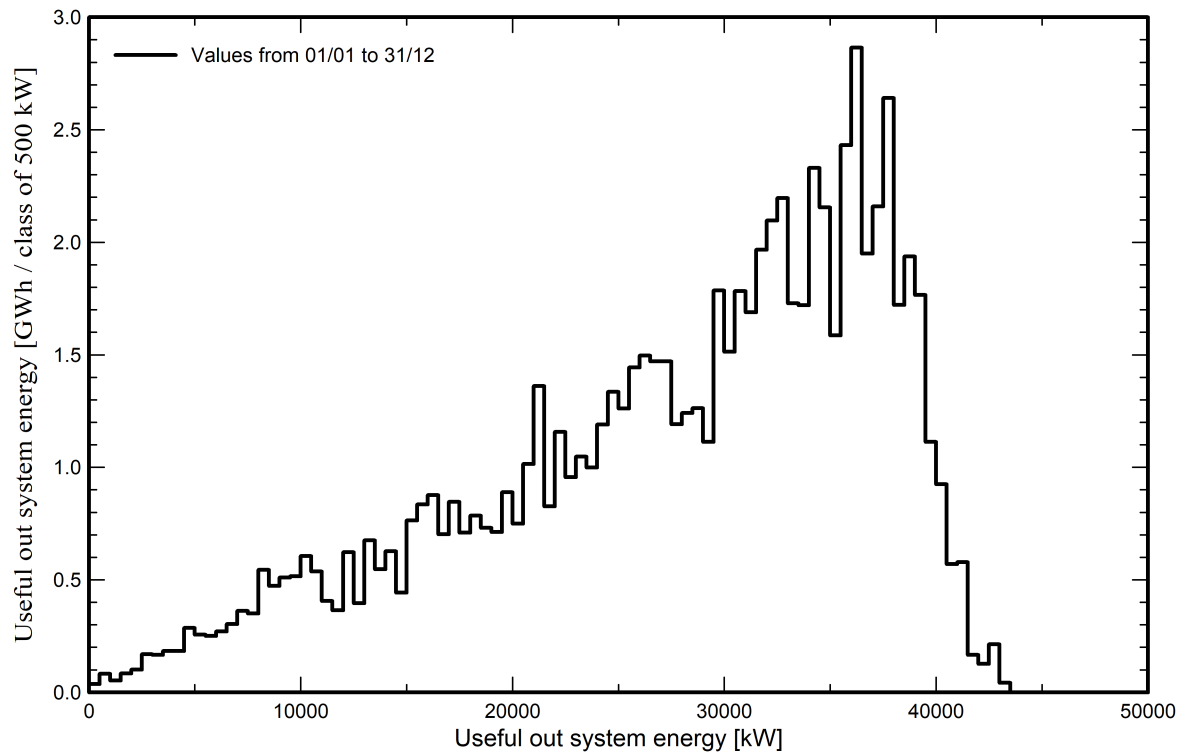
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Predef. graphs

Daily Input/Output diagram



System Output Power Distribution

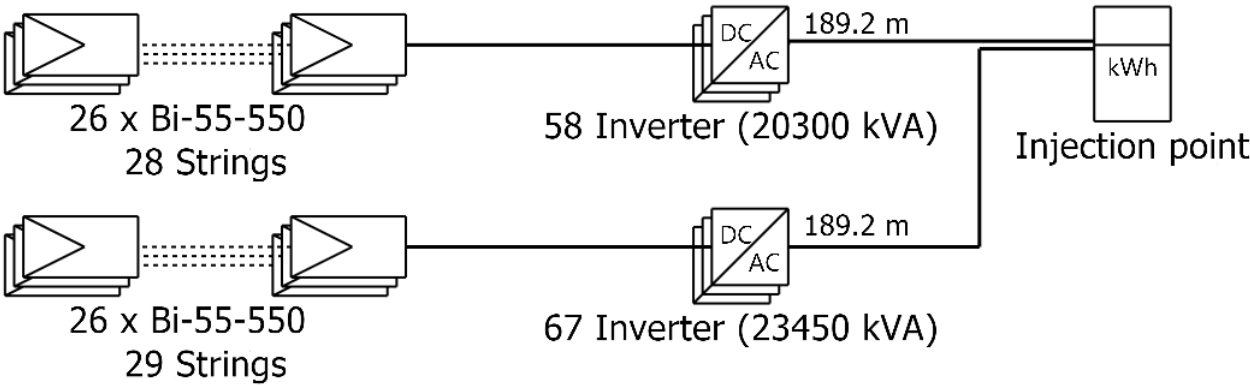




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Single-line diagram



PV module	Bi-55-550
Inverter	SG350-HX
String	26 x Bi-55-550

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VC0 : New simulation variant

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