

PVsyst - Simulation report

Grid-Connected System

Project: JK LONE,KOTA-200KW

Variant: New simulation variant

No 3D scene defined, no shadings

System power: 268 kWp

Kota - India

Author

Oriana power private limited (India)

**PVsyst V7.3.2**

VC0, Simulation date:
16/03/23 16:37
with v7.3.2

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Project summary**Geographical Site**

Kota
India

Situation

Latitude 25.20 °N
Longitude 75.86 °E
Altitude 268 m
Time zone UTC+5.5

Project settings

Albedo 0.20

Meteo data

Kota
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 20 / 16 °

Near Shadings

No Shadings

User's needs

Unlimited load (grid)

System information**PV Array**

Nb. of modules 800 units
Pnom total 268 kWp

Inverters

Nb. of units 2 units
Pnom total 200 kWac
Pnom ratio 1.340

Results summary

Produced Energy 440554 kWh/year Specific production 1644 kWh/kWp/year Perf. Ratio PR 85.28 %

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
P50 - P90 evaluation	7
Single-line diagram	8



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General parameters

Grid-Connected System

No 3D scene defined, no shadings

PV Field Orientation

Orientation

Fixed plane

Tilt/Azimuth 20 / 16 °

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

GOLDI SOLAR PVT LTD

Model

GOLDI072F335PY24

(Custom parameters definition)

Unit Nom. Power

335 Wp

Number of PV modules

800 units

Nominal (STC)

268 kWp

Modules

40 Strings x 20 In series

At operating cond. (50°C)

Pmpp

244 kWp

U mpp

706 V

I mpp

346 A

Total PV power

Nominal (STC)

268 kWp

Total

800 modules

Module area

1588 m²

Cell area

1452 m²

Inverter

Manufacturer

Sungrow

Model

SG110-CX

(Original PVsyst database)

Unit Nom. Power

100 kWac

Number of inverters

2 units

Total power

200 kWac

Operating voltage

200-1000 V

Max. power (=>45°C)

110 kWac

Pnom ratio (DC:AC)

1.34

Power sharing within this inverter

Total inverter power

Total power

200 kWac

Max. power

220 kWac

Number of inverters

2 units

Pnom ratio

1.34

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

DC wiring losses

Global array res.

34 mΩ

Loss Fraction

1.5 % at STC

LID - Light Induced Degradation

Loss Fraction 0.5 %

Module Quality Loss

Loss Fraction -1.5 %

Module mismatch losses

Loss Fraction 0.1 % at MPP

Strings Mismatch loss

Loss Fraction 0.1 %

IAM loss factor

Incidence effect (IAM): User defined profile

0°	10°	20°	40°	50°	60°	70°	80°	90°
1.000	0.999	0.998	0.983	0.967	0.945	0.912	0.764	0.000



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Main results

System Production

Produced Energy

440554 kWh/year

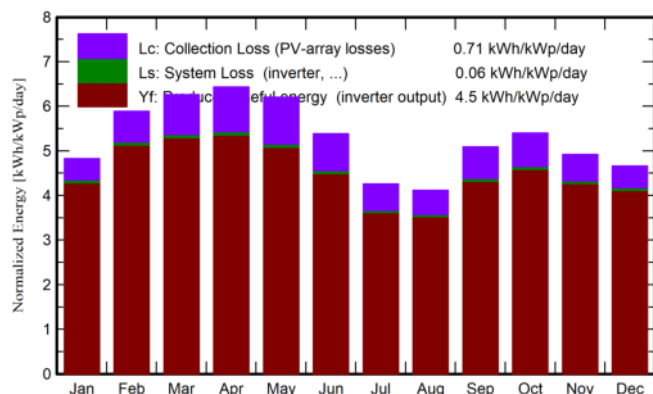
Specific production

1644 kWh/kWp/year

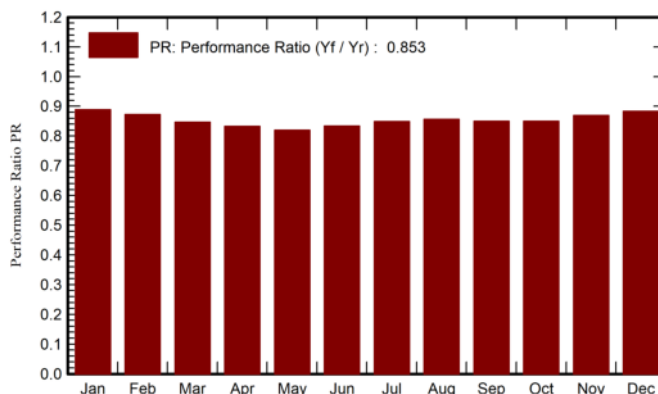
Performance Ratio PR

85.28 %

Normalized productions (per installed kWp)



Performance Ratio PR



Balances and main results

	GlobHor kWh/m ²	DiffHor kWh/m ²	T_Amb °C	GlobInc kWh/m ²	GlobEff kWh/m ²	EArray kWh	E_Grid kWh	PR ratio
January	118.5	47.19	16.87	149.6	142.9	36160	35643	0.889
February	137.2	48.58	20.78	164.9	157.9	39073	38542	0.872
March	176.5	68.19	27.15	194.1	185.8	44625	44022	0.846
April	187.9	77.94	31.76	193.1	185.0	43720	43101	0.833
May	200.0	94.84	36.68	192.3	183.8	42842	42252	0.820
June	171.9	99.60	34.18	161.7	154.0	36664	36152	0.834
July	139.6	92.46	30.41	132.2	125.4	30505	30062	0.849
August	129.3	86.79	28.70	127.6	121.7	29748	29302	0.857
September	144.9	73.40	29.26	152.7	145.8	35274	34771	0.850
October	146.7	68.56	28.68	167.4	160.2	38654	38119	0.850
November	120.1	54.46	23.32	147.5	140.9	34844	34368	0.869
December	112.2	44.45	18.60	144.6	138.0	34707	34218	0.883
Year	1784.8	856.45	27.22	1927.6	1841.4	446816	440554	0.853

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

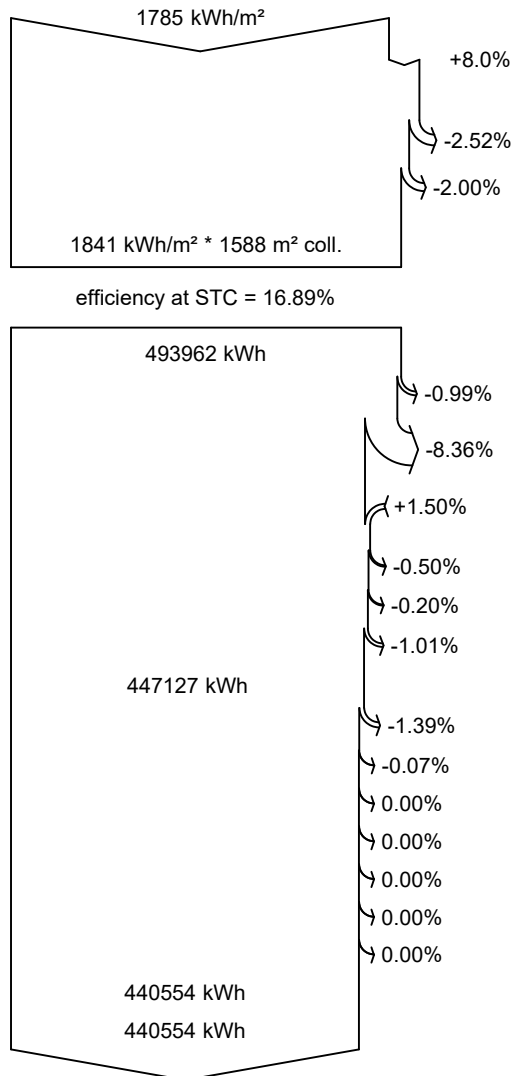
EArray Effective energy at the output of the array

E_Grid Energy injected into grid

PR Performance Ratio



Loss diagram



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

Module quality loss

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

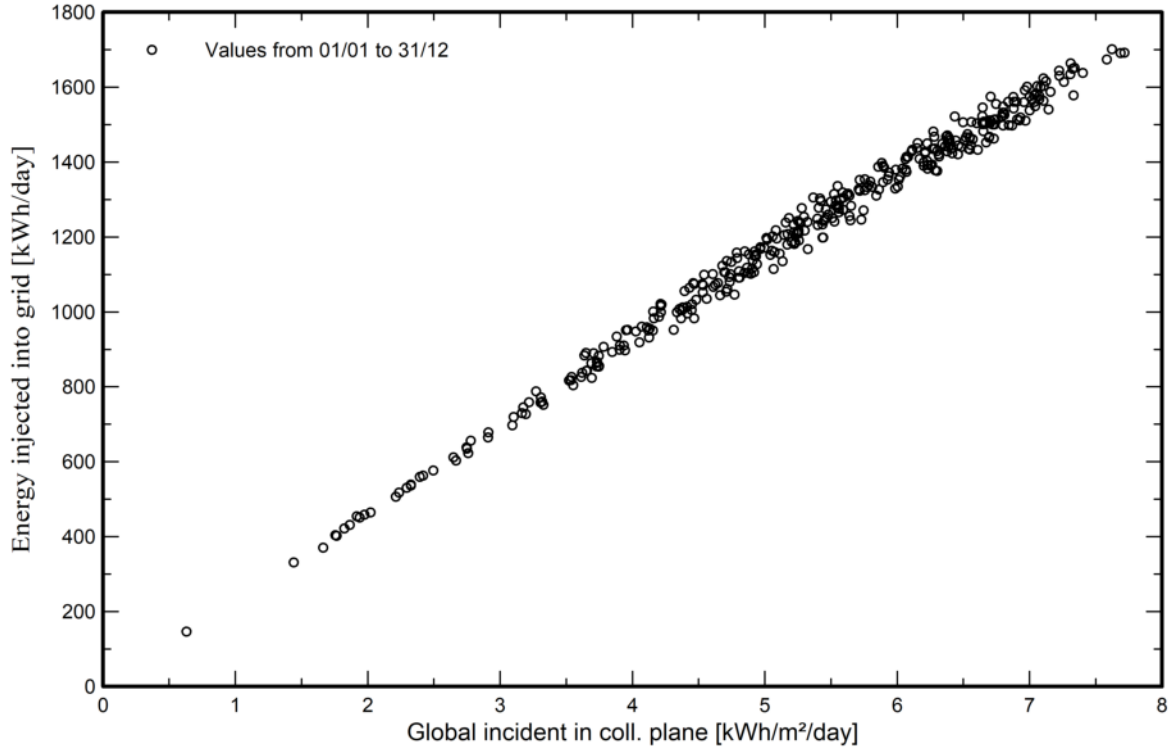
Available Energy at Inverter Output

Energy injected into grid

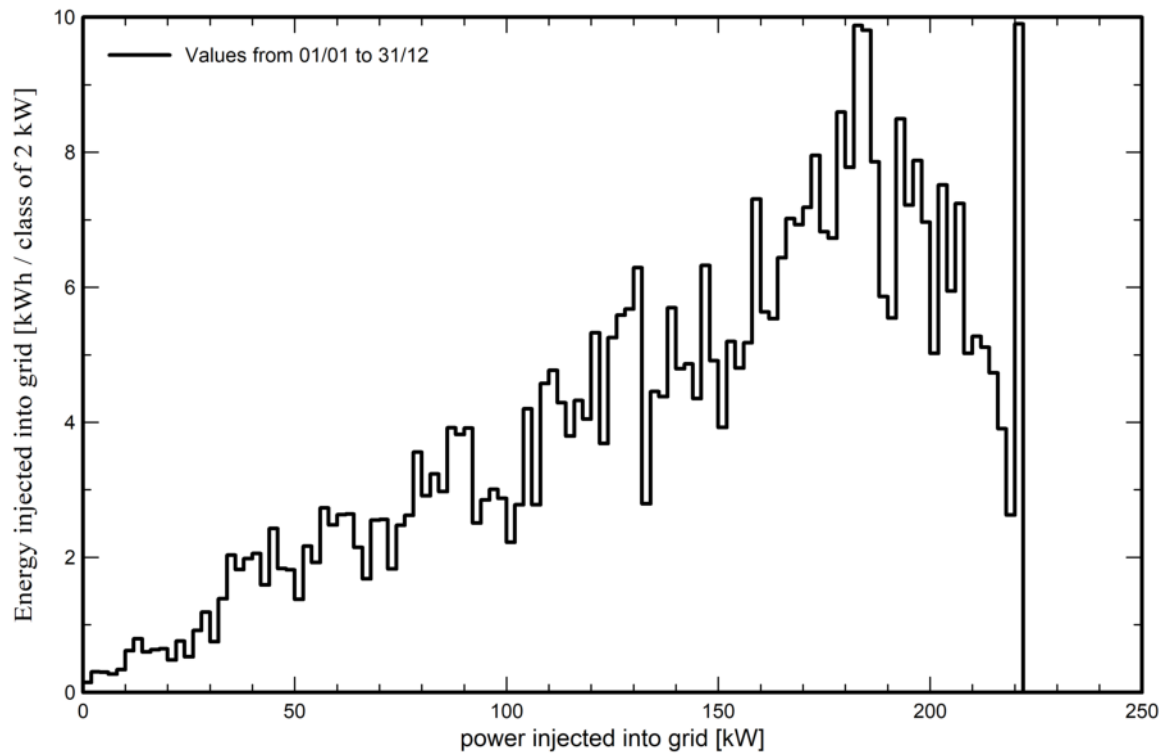


Predef. graphs

Daily Input/Output diagram



System Output Power Distribution





P50 - P90 evaluation

Meteo data

Source Meteonorm 8.1 (1996-2015), Sat=100%
Kind Not defined
Year-to-year variability(Variance) -1.0 %

Specified Deviation

Global variability (meteo + system)

Variability (Quadratic sum) 2.1 %

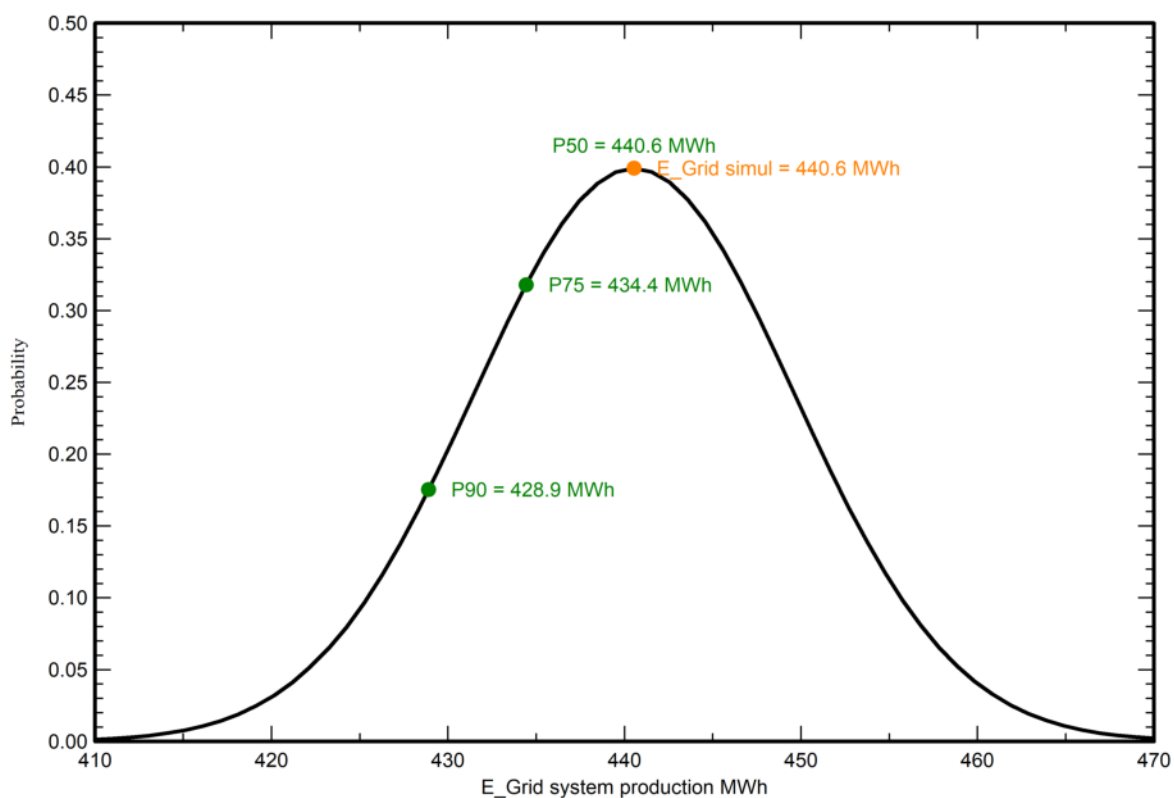
Simulation and parameters uncertainties

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 9.1 MWh
P50 440.6 MWh
P90 428.9 MWh
P75 434.4 MWh

Probability distribution

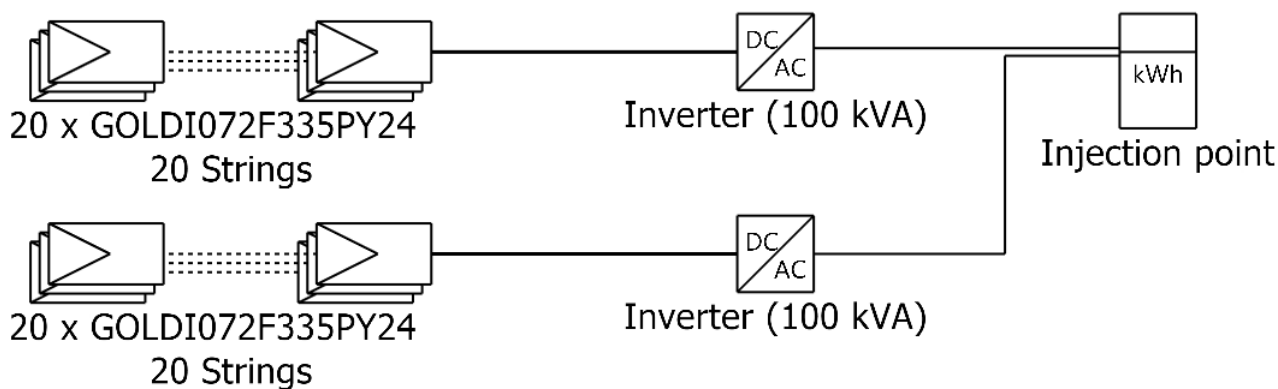




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Single-line diagram



PV module	GOLDI072F335PY24
Inverter	SG110-CX
String	20 x GOLDI072F335PY24

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