Version 7.3.1

PVsyst - Simulation report

Grid-Connected System

Project: OnGrid_8KW_Patna

Variant: Home_8KW_ongrid_design

No 3D scene defined, no shadings

System power: 9.12 kWp

Home - India

Author

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Project summary

Geographical Site
Home
India

Situation
Latitude 25.57 °N
Longitude 85.10 °E
Altitude 56 m
Time zone UTC+5.5

Project settings
Albedo 0.20

Meteo data
Home
Meteonorm 8.1 (1991-2012), Sat=100% - Synthetic

System summary

Grid-Connected System

No 3D scene defined, no shadings

PV Field Orientation
Fixed plane
Tilt/Azimuth 24 / 0 °

Near Shadings
No Shadings

User's needs
Unlimited load (grid)

System information

PV Array
Nb. of modules 32 units
Pnom total 9.12 kWp

Inverters
Nb. of units 1 unit
Pnom total 8.00 kWac
Pnom ratio 1.140

Results summary

Produced Energy	12116 kWh/year	Specific production	1328 kWh/kWp/year	Perf. Ratio PR	82.14 %

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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 24 / 0 °		Diffuse Perez, Meteonorm
		Circumsolar separate

Horizon
Free Horizon

Near Shadings
No Shadings

User's needs
Unlimited load (grid)

PV Array Characteristics

PV module

Manufacturer	Vikram Solar
Model	Eldora VSP.60.285.05
(Original PVsyst database)	
Unit Nom. Power	285 Wp
Number of PV modules	32 units
Nominal (STC)	9.12 kWp
Modules	4 Strings x 8 In series
At operating cond. (50°C)	
Pmpp	8.28 kWp
U mpp	231 V
I mpp	36 A

Inverter

Manufacturer	Huawei Technologies
Model	SUN2000-8KTL-M1 220Vac
(Original PVsyst database)	
Unit Nom. Power	8.00 kWac
Number of inverters	2 * MPPT 50% 1 unit
Total power	8.0 kWac
Operating voltage	140-980 V
Max. power (=>45°C)	8.80 kWac
Pnom ratio (DC:AC)	1.14
No Power sharing between MPPTs	

Total PV power

Nominal (STC)	9 kWp
Total	32 modules
Module area	52.1 m²

Total inverter power

Total power	8 kWac
Number of inverters	1 unit
Pnom ratio	1.14

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. 108 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

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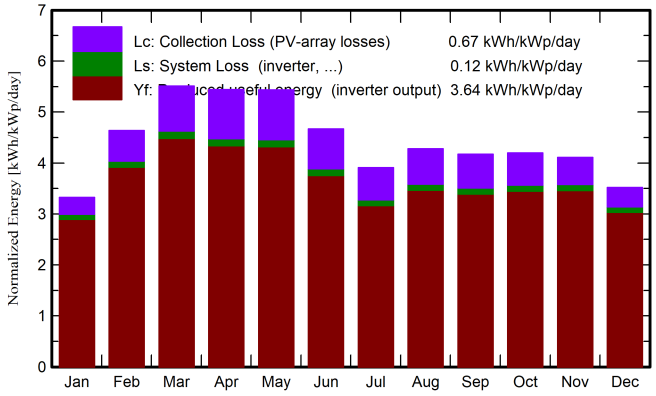
Main results

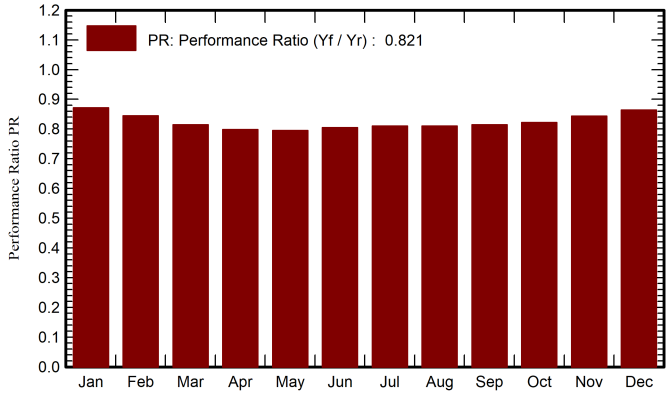
System Production

Produced Energy	12116 kWh/year	Specific production	1328 kWh/kWp/year
		Performance Ratio PR	82.14 %

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	87.0	59.5	14.99	103.1	100.3	847	819	0.871
February	110.4	60.9	20.09	129.9	126.8	1033	1001	0.845
March	156.1	79.4	26.06	170.9	166.9	1309	1269	0.814
April	162.5	89.3	30.52	163.2	158.6	1226	1188	0.798
May	177.5	100.3	32.19	168.5	163.5	1262	1222	0.795
June	151.0	100.0	31.73	140.1	135.6	1064	1028	0.805
July	129.3	83.3	30.45	121.3	117.2	928	896	0.810
August	136.1	87.3	30.25	132.7	128.3	1014	980	0.810
September	121.0	75.8	29.26	125.2	121.3	961	929	0.814
October	116.2	73.0	27.48	130.2	126.6	1009	976	0.822
November	101.9	61.5	22.16	123.3	120.3	979	948	0.843
December	88.3	55.4	16.83	109.1	106.3	888	859	0.864
Year	1537.2	925.7	26.02	1617.4	1571.8	12520	12116	0.821

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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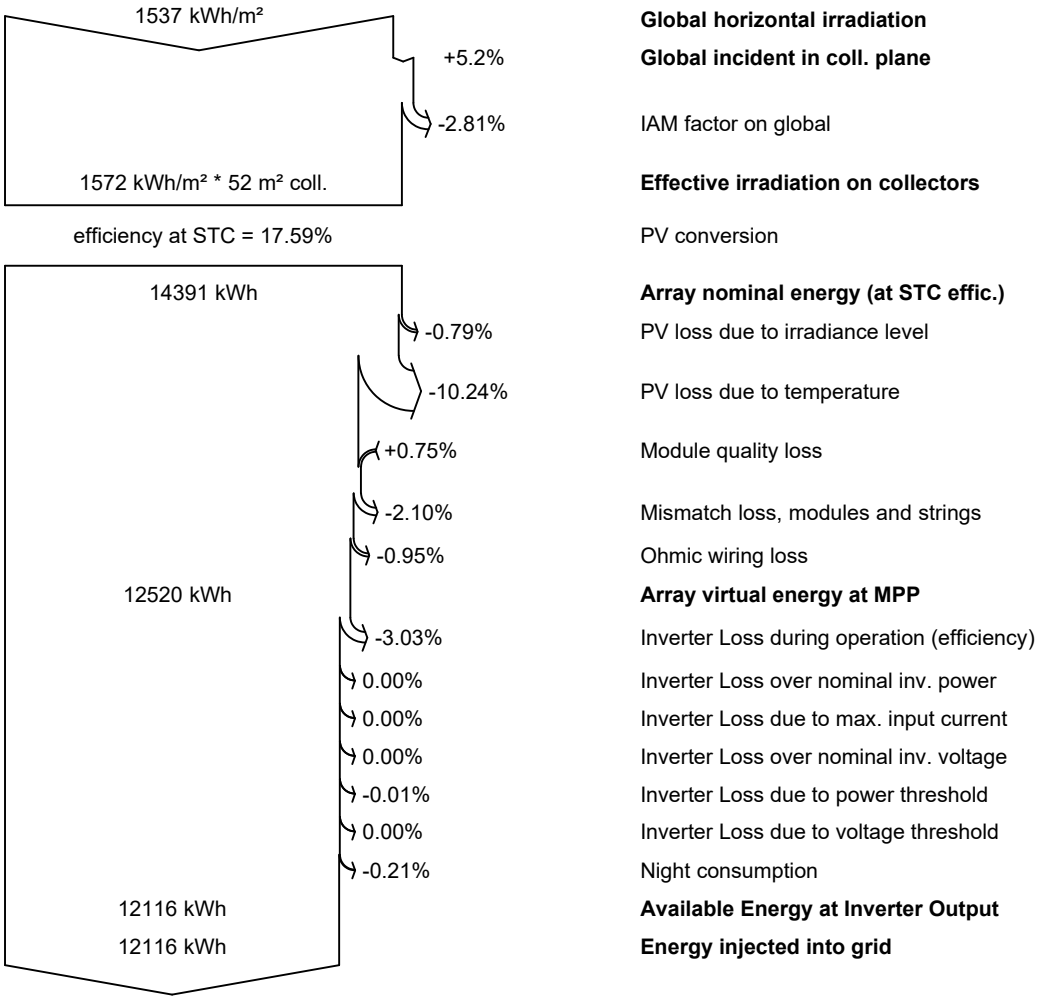
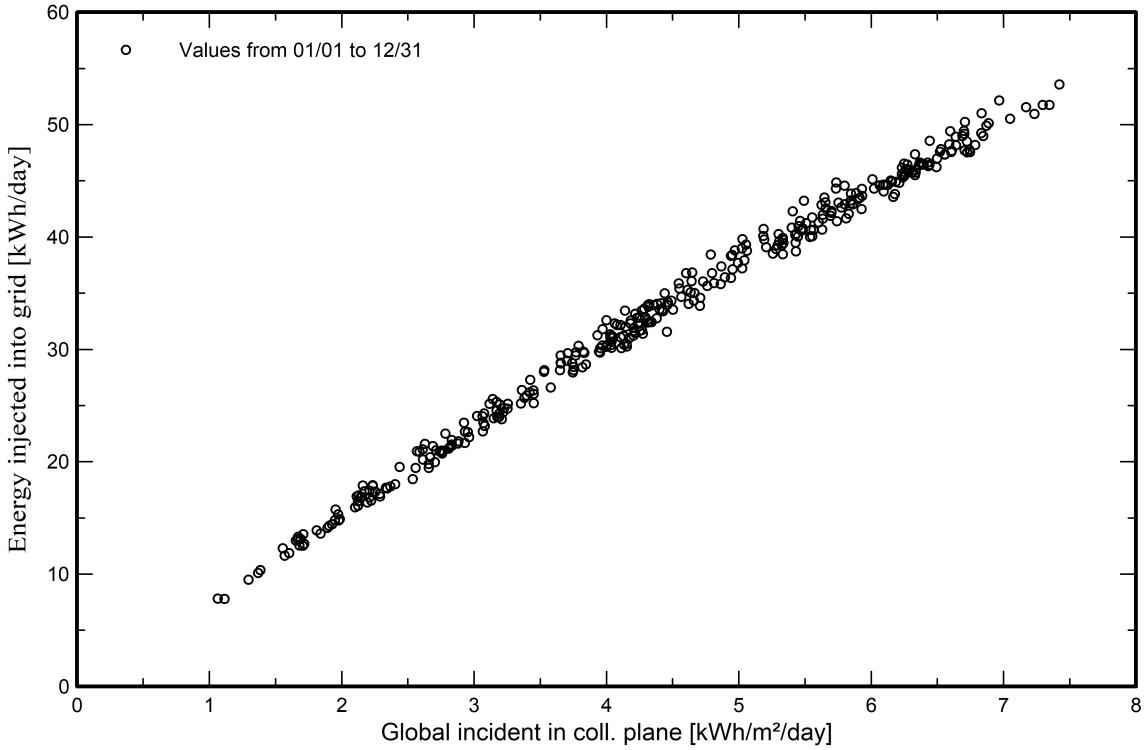
Loss diagram

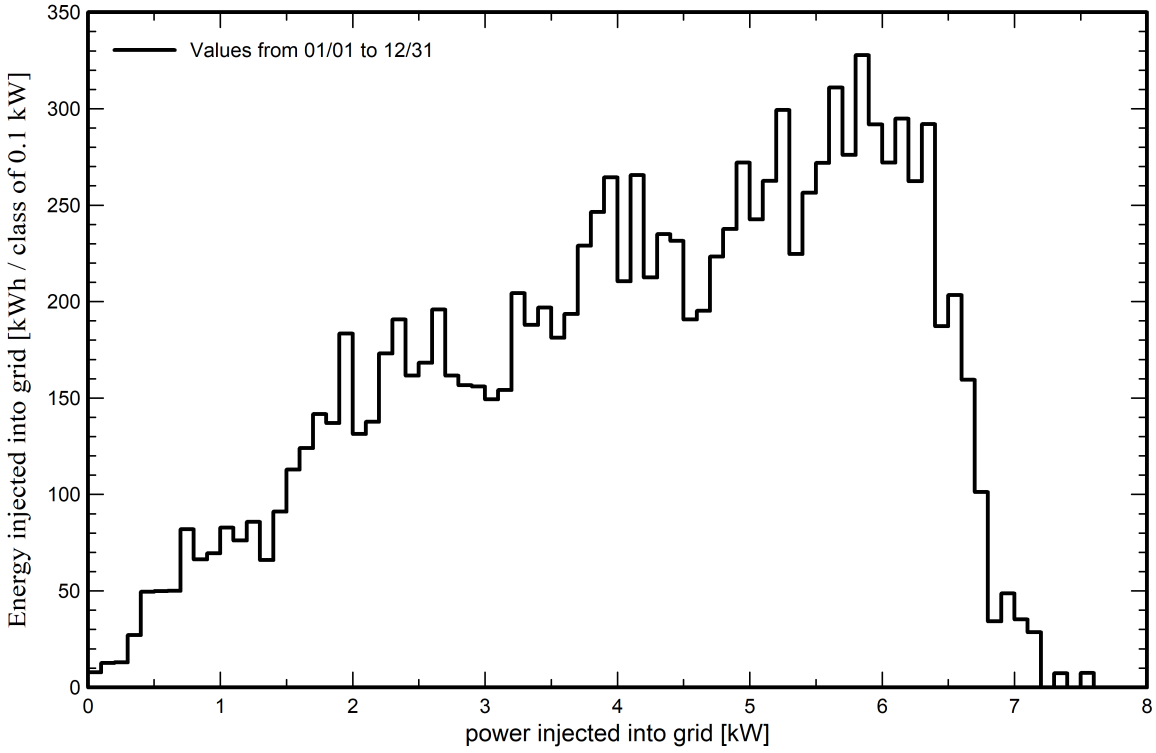


Predef. graphs

Daily Input/Output diagram



System Output Power Distribution



Single-line diagram

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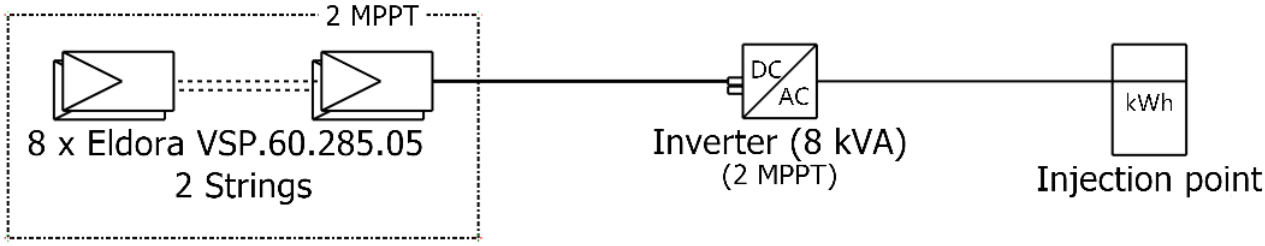

PV module	Eldora VSP.60.285.05
Inverter	SUN2000-8KTL-M1 220Vac
String	8 x Eldora VSP.60.285.05

	OnGrid_8KW_Patna	
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Cost of the system

Installation costs

Item	Quantity units	Cost EUR	Total EUR
		Total	0.00
		Depreciable asset	0.00

Operating costs

Item	Total EUR/year
Total (OPEX)	0.00

System summary

Total installation cost	0.00	EUR
Operating costs	0.00	EUR/year
Produced Energy	12.1	MWh/year
Cost of produced energy (LCOE)	0.000	EUR/kWh

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CO_2 Emission Balance

Total: 276.9 tCO_2

Generated emissions

Total: 18.24 tCO_2

Source: Detailed calculation from table below:

Replaced Emissions

Total: 340.2 tCO_2

System production: 12.12 MWh/yr

Grid Lifecycle Emissions: 936 gCO_2/kWh

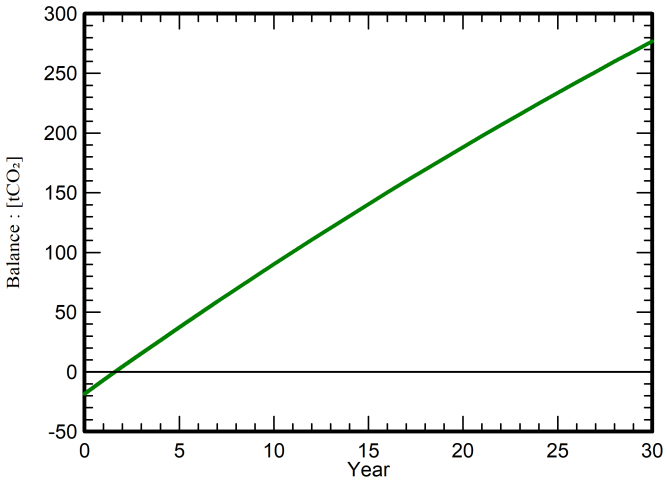
Source: IEA List

Country: India

Lifetime: 30 years

Annual degradation: 1.0 %

Saved CO_2 Emission vs. Time



System Lifecycle Emissions Details

Item	LCE	Quantity	Subtotal
			[$kgCO_2$]
Modules	1713 kgCO2/kWp	9.12 kWp	15620
Supports	6.24 kgCO2/kg	320 kg	1998
Inverters	619 kgCO2/	1.00	619