PVsyst - Simulation report

Grid-Connected System

Project: 2KW_Solar_System_Performance_Optimization

Variant: New simulation variant
No 3D scene defined, no shadings
System power: 2860 Wp
Vaibhav_Suryavanshi_House - India

Author

PVsyst V8.0.7
VC0, Simulation date:
09/03/25 19:33
with V8.0.7

Project summary

Geographical Site
Vaibhav_Suryavanshi_House

India

Situation
Latitude	20.72 °N
Longitude	76.54 °E
Altitude	300 m
Time zone	UTC+5.5

Project settings
Albedo	0.20

Weather data
Vaibhav_Suryavanshi_House

Meteonorm 8.2 (2001-2020), Sat=100% - Synthetic

System summary

Grid-Connected System

No 3D scene defined, no shadings

Orientation #1
Fixed plane

Tilt/Azimuth   20 / 0 °

Near Shadings
no Shadings

User's needs
Unlimited load (grid)

System information

PV Array		Inverters	
Nb. of modules	11 units	Nb. of units	1 unit
Pnom total	2860 Wp	Pnom total	2000 W
		Pnom ratio	1.430

Results summary

Produced Energy	4449.0 kWh/year	Specific production	1556 kWh/kWp/year	Perf. Ratio PR	80.31 %

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General parameters

Grid-Connected System	No 3D scene defined, no shadings	

Orientation #1 | | **Models used**

Fixed plane		Sheds configuration		Transposition	Perez
Tilt/Azimuth	20 / 0 °	No 3D scene defined		Diffuse	Perez, Meteonorm
				Circumsolar	separate

Horizon		Near Shadings		User's needs	
Free Horizon		no Shadings		Unlimited load (grid)	

PV Array Characteristics

PV module | **Inverter**

PV module		Inverter	
Manufacturer	Generic	Manufacturer	Generic
Model	Eldora VSP.60.260.05_U	Model	HNS2000TL-1 (2022)
(Original PVsyst database)		(Original PVsyst database)	
Unit Nom. Power	260 Wp	Unit Nom. Power	2.00 kWac
Number of PV modules	11 units	Number of inverters	1 unit
Nominal (STC)	2860 Wp	Total power	2.0 kWac
Modules	1 strings x 11 In series	Operating voltage	50-500 V
At operating cond. (50°C)		Max. power (=>40°C)	2.20 kWac
Pmpp	2584 Wp	Pnom ratio (DC:AC)	1.43
U mpp	306 V		
I mpp	8.5 A		

Total PV power		Total inverter power	
Nominal (STC)	2.86 kWp	Total power	2 kWac
Total	11 modules	Max. power	2.2 kWac
Module area	17.9 m²	Number of inverters	1 unit
		Pnom ratio	1.43

Array losses

Thermal Loss factor | **DC wiring losses** | **Module Quality Loss**

Module temperature according to irradiance		Global array res.	606 mΩ	Loss Fraction	-0.8 %
Uc (const)	20.0 W/m²K	Loss Fraction	1.5 % at STC		
Uv (wind)	0.0 W/m²K/m/s				

Module mismatch losses

Loss Fraction	2.0 % at MPP

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	0.402	0.000

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Main results

System Production

Produced Energy	4449.0 kWh/year	Specific production	1556 kWh/kWp/year
		Perf. Ratio PR	80.31 %

Normalized productions (per installed kWp)

Lc: Collection Loss (PV-array losses) — 0.92 kWh/kWp/day
Ls: System Loss (inverter, ...) — 0.12 kWh/kWp/day
Yf: Produced useful energy (inverter output) — 4.26 kWh/kWp/day

Performance Ratio PR

PR: Performance Ratio (Yf / Yr) : 0.803
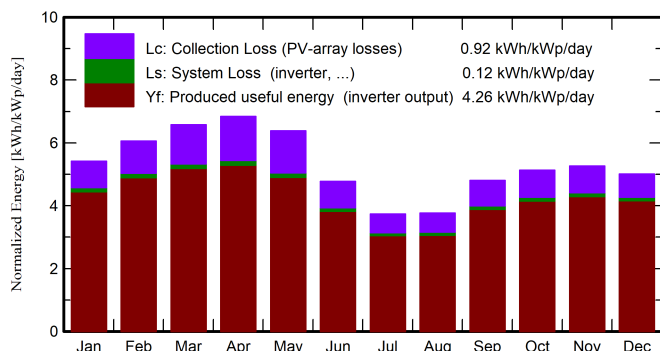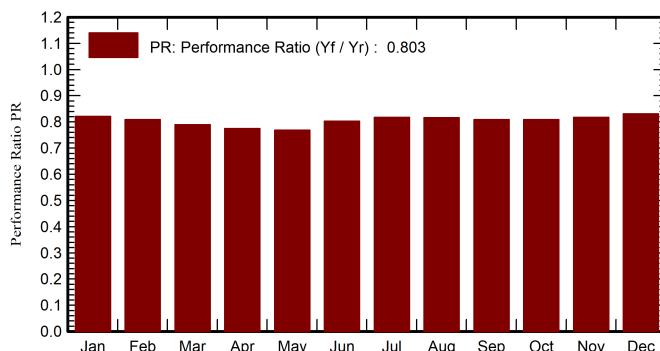
Balances and main results

	GlobHor	DiffHor	T_Amb	GlobInc	GlobEff	EArray	E_Grid	PR
	kWh/m²	kWh/m²	°C	kWh/m²	kWh/m²	kWh	kWh	ratio
January	135.3	46.30	21.73	168.0	164.4	405.9	394.2	0.820
February	145.1	57.13	25.45	169.6	165.7	403.4	392.5	0.809
March	188.2	71.89	29.61	203.9	199.1	472.7	460.1	0.789
April	204.6	75.41	32.67	205.2	200.0	467.7	454.4	0.774
May	210.2	88.30	36.17	198.0	192.2	448.0	435.5	0.769
June	154.6	99.01	31.54	143.2	138.0	338.2	328.9	0.803
July	123.9	88.06	28.39	115.9	111.1	279.4	270.8	0.817
August	120.0	80.65	27.24	116.7	112.5	281.2	272.3	0.816
September	139.3	75.10	27.37	144.0	139.7	343.3	333.4	0.809
October	143.4	71.86	27.21	159.2	154.9	378.9	368.4	0.809
November	130.9	52.56	24.26	157.9	154.1	379.4	369.2	0.818
December	123.8	52.35	21.75	155.4	151.6	379.6	369.4	0.831
Year	1819.3	858.61	27.79	1937.0	1883.1	4577.7	4449.0	0.803

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

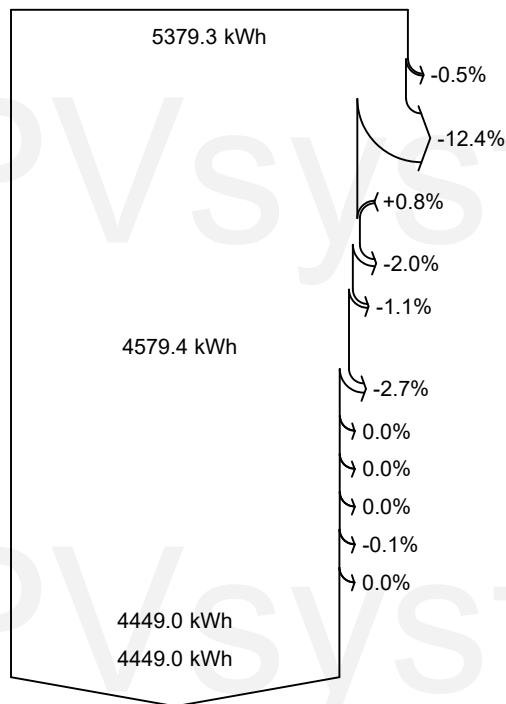|	
EArray	Effective energy at the output of the array
E_Grid	Energy injected into grid
PR	Performance Ratio

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Loss diagram
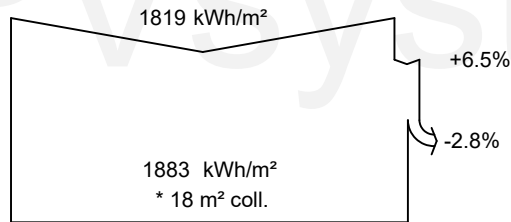
|	
1819 kWh/m²	**Global horizontal irradiation**
+6.5%	**Global incident in coll. plane**
-2.8%	IAM factor on global
1883 kWh/m² * 18 m² coll.	**Effective irradiation on collectors**
efficiency at STC = 15.96%	PV conversion
5379.3 kWh	**Array nominal energy (at STC effic.)**
-0.5%	PV loss due to irradiance level
-12.4%	PV loss due to temperature
+0.8%	Module quality loss
-2.0%	Module array mismatch loss
-1.1%	Ohmic wiring loss
4579.4 kWh	**Array virtual energy at MPP**
-2.7%	Inverter Loss during operation (efficiency)
0.0%	Inverter Loss over nominal inv. power
0.0%	Inverter Loss due to max. input current
0.0%	Inverter Loss over nominal inv. voltage
-0.1%	Inverter Loss due to power threshold
0.0%	Inverter Loss due to voltage threshold
4449.0 kWh	**Available Energy at Inverter Output**
4449.0 kWh	**Energy injected into grid**

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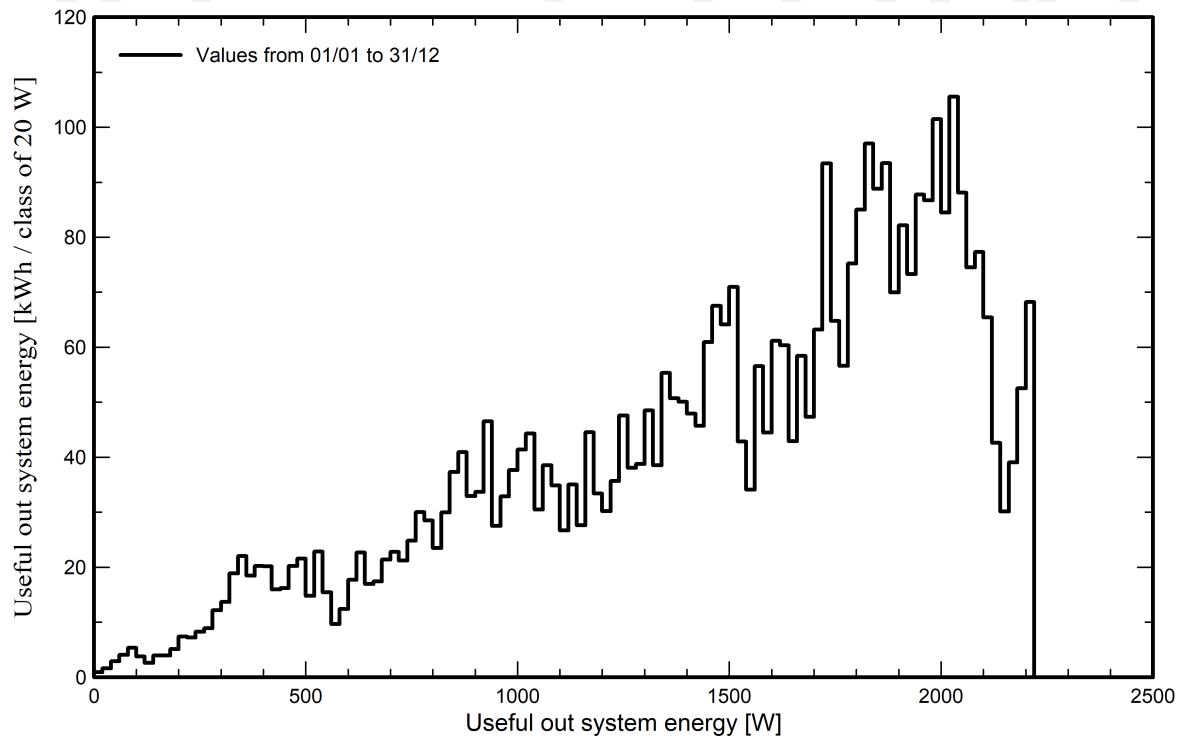VC0, Simulation date:
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Predef. graphs

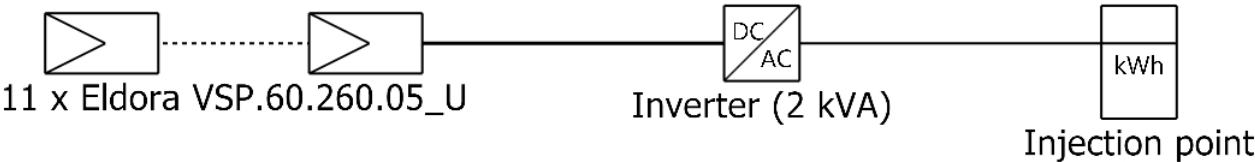### Daily Input/Output diagram
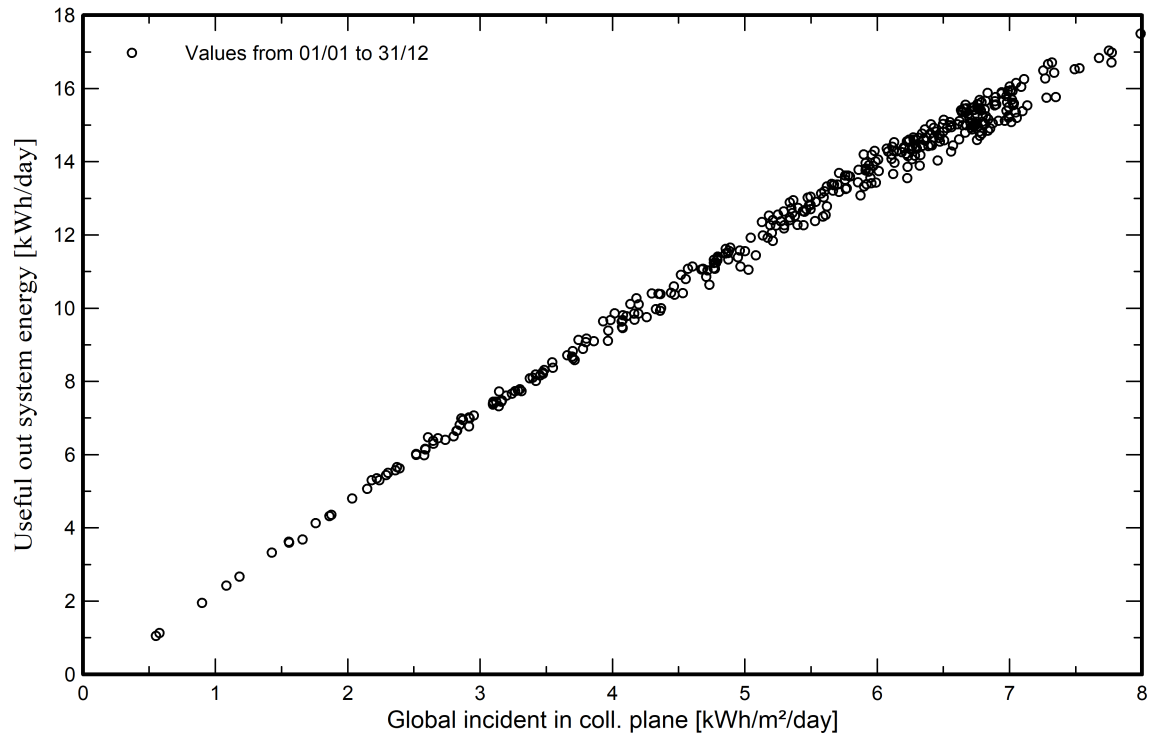
System Output Power Distribution

Single-line diagram

11 x Eldora VSP.60.260.05_U

DC / AC

Inverter (2 kVA)

kWh

Injection point

PV module	Eldora VSP.60.260.05_U
Inverter	HNS2000TL-1 (2022)
String	11 x Eldora VSP.60.260.05_U

2KW_Solar_System_Performance_Optimization	
VC0 : New simulation variant	09/03/25