

PVsyst - Simulation report

Grid-Connected System

Project: Saha Farm

Variant: 01

No 3D scene defined, no shadings

System power: 200 kWp

Ban Nong Chum Saeng Tawan Tok - Thailand

Author

**PVsyst V7.4.6**

VC0, Simulation date:
05/01/24 23:22
with V7.4.6

Project summary**Geographical Site**

Ban Nong Chum Saeng Tawan Tok
Thailand

Situation

Latitude 15.88 °N
Longitude 101.01 °E
Altitude 80 m
Time zone UTC+7

Project settings

Albedo 0.20

Weather data

Ban Nong Chum Saeng Tawan Tok
Meteonorm 8.1 (1996-2015), Sat=100% - Synthetic

System summary**Grid-Connected System**

No 3D scene defined, no shadings

PV Field Orientation

Fixed planes 2 orientations
Tilts/azimuths 20 / 20 °
20 / -160 °

Near Shadings

No Shadings

User's needs

Unlimited load (grid)

System information**PV Array**

Nb. of modules 288 units
Pnom total 200 kWp

Inverters

Nb. of units 3 units
Pnom total 180 kWac
Pnom ratio 1.112

Results summary

Produced Energy 248543 kWh/year Specific production 1242 kWh/kWp/year Perf. Ratio PR 75.01 %

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
Single-line diagram	7



PVsyst V7.4.6

VC0, Simulation date:
05/01/24 23:22
with V7.4.6

General parameters

Grid-Connected System

No 3D scene defined, no shadings

PV Field Orientation

Orientation

Fixed planes 2 orientations
Tilts/azimuths 20 / 20 °
20 / -160 °

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

Model

(Original PVsyst database)

Unit Nom. Power

Number of PV modules

Nominal (STC)

Modules

At operating cond. (50°C)

Pmpp

U mpp

I mpp

Total PV power

Nominal (STC)

Total

Module area

Generic

CS7N-695TB-AG 1500V

695 Wp

288 units

200 kWp

16 string x 18 In series

186 kWp

658 V

282 A

200 kWp

288 modules

895 m²

Inverter

Manufacturer

Model

(Original PVsyst database)

Unit Nom. Power

Number of inverters

Total power

Operating voltage

Max. power (=>30°C)

Pnom ratio (DC:AC)

Power sharing within this inverter

Generic

SUN2000-60KTL-M0_400Vac

60.0 kWac

3 units

180 kWac

200-1000 V

66.0 kWac

1.11

Total inverter power

Total power

Max. power

Number of inverters

Pnom ratio

180 kWac

198 kWac

3 units

1.11

Array losses

Array Soiling Losses

Loss Fraction 7.5 %

Thermal Loss factor

Module temperature according to irradiance

Uc (const) 20.0 W/m²KUv (wind) 0.0 W/m²K/m/s

DC wiring losses

Global array res. 38 mΩ

Loss Fraction 1.5 % at STC

LID - Light Induced Degradation

Loss Fraction 3.0 %

Module Quality Loss

Loss Fraction 2.0 %

Module mismatch losses

Loss Fraction 2.0 % at MPP

IAM loss factor

Incidence effect (IAM): Fresnel, AR coating, n(glass)=1.526, n(AR)=1.290

0°	30°	50°	60°	70°	75°	80°	85°	90°
1.000	0.999	0.987	0.962	0.892	0.816	0.681	0.440	0.000



PVsyst V7.4.6

VC0, Simulation date:
05/01/24 23:22
with V7.4.6

Main results

System Production

Produced Energy

248543 kWh/year

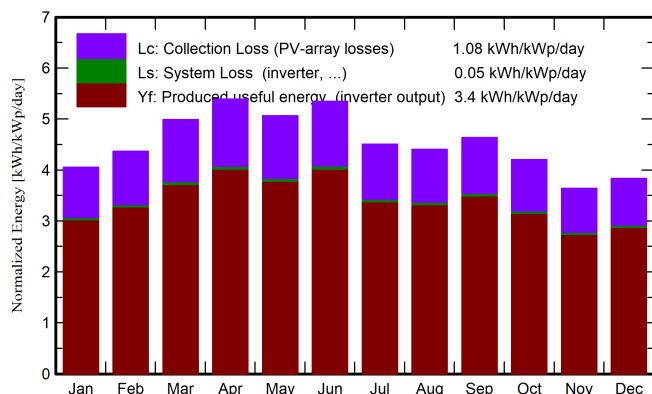
Specific production

1242 kWh/kWp/year

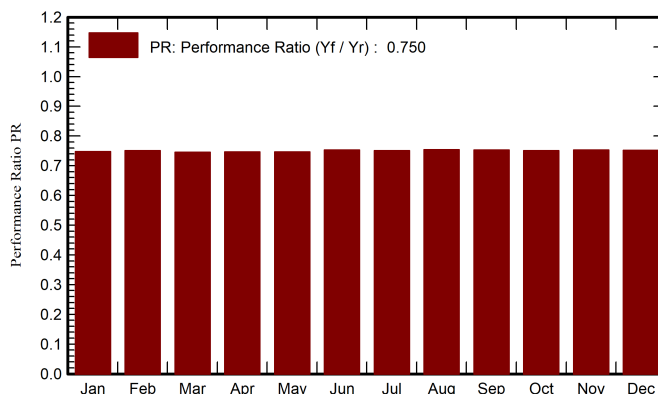
Perf. Ratio PR

75.01 %

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	130.1	57.30	25.36	125.7	112.1	19080	18795	0.747
February	126.8	70.84	27.58	122.4	109.9	18653	18381	0.751
March	160.5	86.86	29.65	154.7	139.5	23420	23082	0.746
April	167.7	90.98	30.23	161.7	146.1	24505	24150	0.746
May	163.0	81.15	29.76	157.0	141.8	23818	23467	0.747
June	166.2	88.08	28.81	160.4	144.9	24520	24163	0.753
July	145.0	77.86	28.71	139.6	126.0	21306	20987	0.751
August	142.1	84.43	28.28	136.6	123.3	20931	20619	0.754
September	144.6	74.00	27.57	139.1	125.4	21296	20978	0.753
October	135.2	69.87	28.00	130.3	117.3	19871	19571	0.750
November	113.7	66.06	26.53	109.2	97.7	16723	16474	0.753
December	123.3	61.58	25.37	118.8	106.0	18148	17877	0.752
Year	1718.3	909.01	27.99	1655.4	1490.1	252272	248543	0.750

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

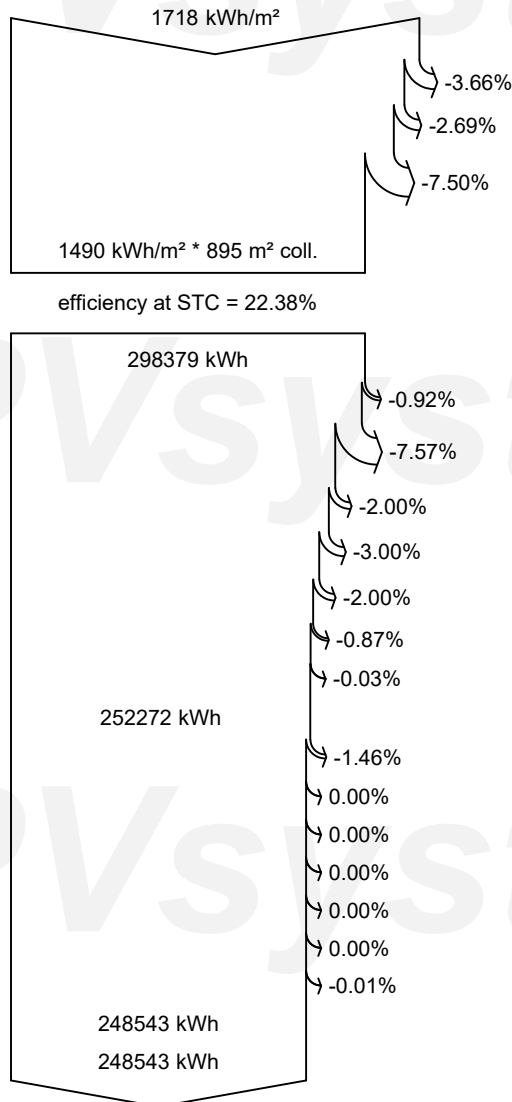
PR Performance Ratio



PVsyst V7.4.6

VC0, Simulation date:
05/01/24 23:22
with V7.4.6

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

Module array mismatch loss

Ohmic wiring loss

Mixed orientation mismatch 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

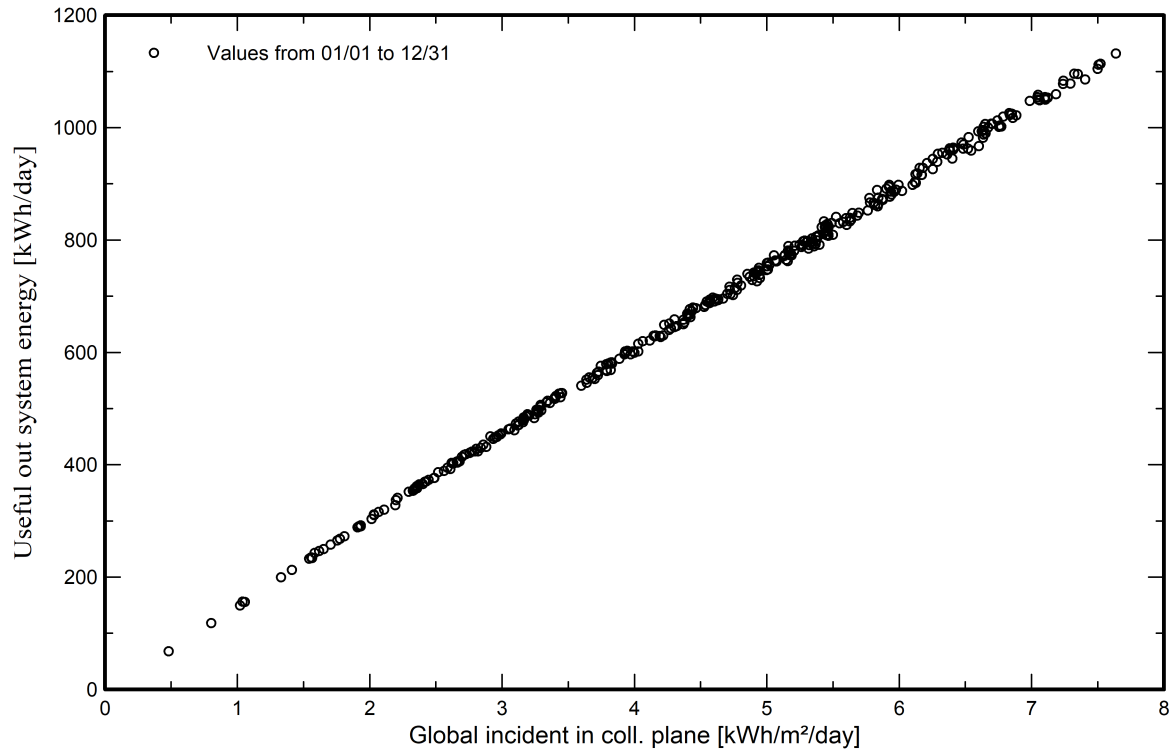


PVsyst V7.4.6

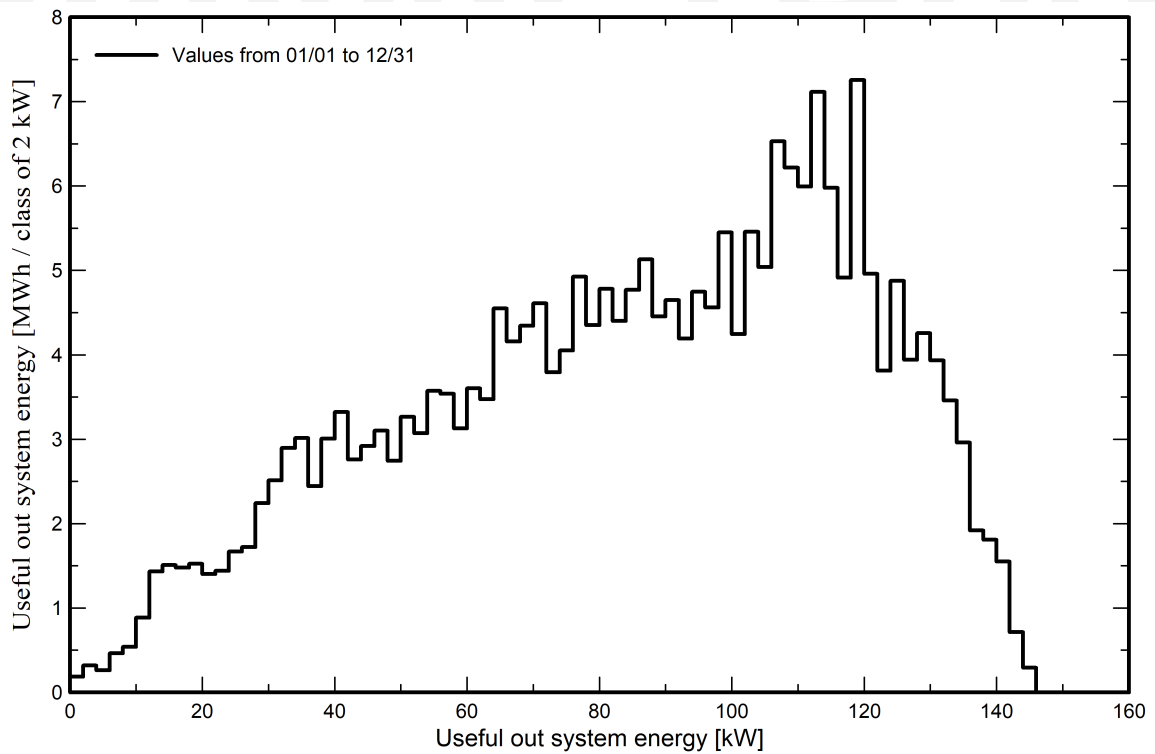
VC0, Simulation date:
05/01/24 23:22
with V7.4.6

Predef. graphs

Daily Input/Output diagram



System Output Power Distribution





PVsyst V7.4.6

VC0, Simulation date:
05/01/24 23:22
with V7.4.6

e-line diagram not available