Version 7.3.4

PVsyst - Simulation report

Grid-Connected System

Project: Sim00

Variant: MONOFACIAL

Unlimited trackers

System power: 51.8 kWp

NREL BEST Field - United States

Author

National renewable energy laboratory (United states)

Project: Sim00

Variant: MONOFACIAL

National renewable energy laboratory (United states)

Project summary

Geographical Site
NREL BEST Field
United States

Situation

Latitude	39.74 °N
Longitude	-105.17 °W
Altitude	1765 m
Time zone	UTC-7

Meteo data
DENVER/CENTENNIAL [GOLDEN - NREL]
NREL BEST Field - TMY

Monthly albedo values

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
Albedo	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.20	0.20

System summary

Grid-Connected System
Unlimited trackers

PV Field Orientation
Orientation
Tracking horizontal axis

Tracking algorithm
Astronomic calculation

Near Shadings
No Shadings

System information

PV Array		Inverters	
Nb. of modules	144 units	Nb. of units	3 units
Pnom total	51.8 kWp	Pnom total	72.0 kWac
		Pnom ratio	0.720

User's needs
Unlimited load (grid)

Results summary

Produced Energy	103381 kWh/year	Specific production	1994 kWh/kWp/year	Perf. Ratio PR	79.35 %

Table of contents

PVsyst V7.3.4
VC1, Simulation date:
06/15/23 09:48
with v7.3.4

National renewable energy laboratory (United states)

General parameters

Grid-Connected System — **Unlimited trackers**

PV Field Orientation

Orientation	Tracking algorithm	Trackers configuration	
Tracking horizontal axis	Astronomic calculation	Nb. of trackers	10 units
		Unlimited trackers	
		Sizes	
		Tracker Spacing	5.70 m
		Collector width	2.00 m
		Ground Cov. Ratio (GCR)	35.1 %
		Left inactive band	0.02 m
		Right inactive band	0.02 m
		Phi min / max.	-/+ 60.0 °
		Shading limit angles	
		Phi limits for BT	-/+ 68.9 °

Models used

Transposition	Perez
Diffuse	Imported
Circumsolar	with diffuse

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

PV Array Characteristics

PV module

Manufacturer	CSI Solar
Model	CS3U-360MB-AG
(Original PVsyst database)	
Unit Nom. Power	360 Wp
Number of PV modules	144 units
Nominal (STC)	51.8 kWp
Modules	9 Strings x 16 In series
At operating cond. (50°C)	
Pmpp	47.1 kWp
U mpp	566 V
I mpp	83 A

Inverter

Manufacturer	Fronius USA
Model	Symo Advanced 24.0-3 480
(Original PVsyst database)	
Unit Nom. Power	24.0 kWac
Number of inverters	3 * MPPT 0.57 3 units
Total power	72.0 kWac
Operating voltage	200-800 V
Pnom ratio (DC:AC)	0.72

Total PV power

Nominal (STC)	52 kWp
Total	144 modules
Module area	289 m²
Cell area	253 m²

Total inverter power

Total power	72 kWac
Number of inverters	3 units
Pnom ratio	0.72

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.	113 mΩ
Loss Fraction	1.5 % at STC

Module Quality Loss

Loss Fraction	-0.4 %

Module mismatch losses

Loss Fraction	2.0 % at MPP

Strings Mismatch loss

Loss Fraction	0.2 %

Array losses

IAM loss factor

Incidence effect (IAM): User defined profile

10°	20°	30°	40°	50°	60°	70°	80°	90°
1.000	1.000	1.000	0.990	0.990	0.970	0.920	0.760	0.000

PVsyst V7.3.4
VC1, Simulation date:
06/15/23 09:48
with v7.3.4

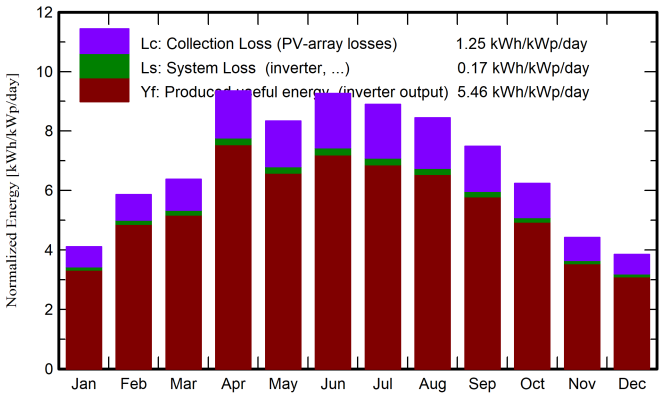
National renewable energy laboratory (United states)

Main results

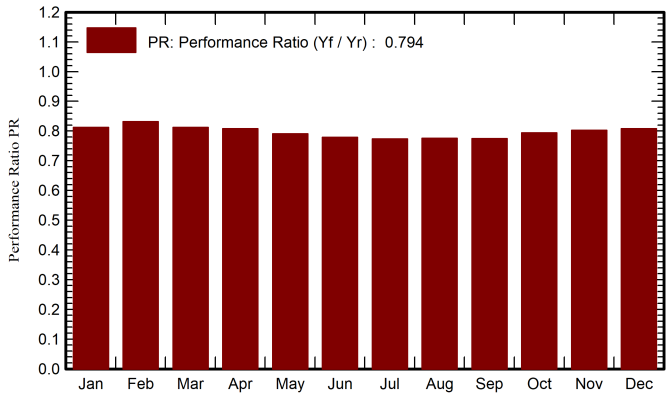
System Production

Produced Energy	103381 kWh/year	Specific production	1994 kWh/kWp/year
		Perf. Ratio PR	79.35 %

Normalized productions (per installed kWp)



Performance Ratio PR



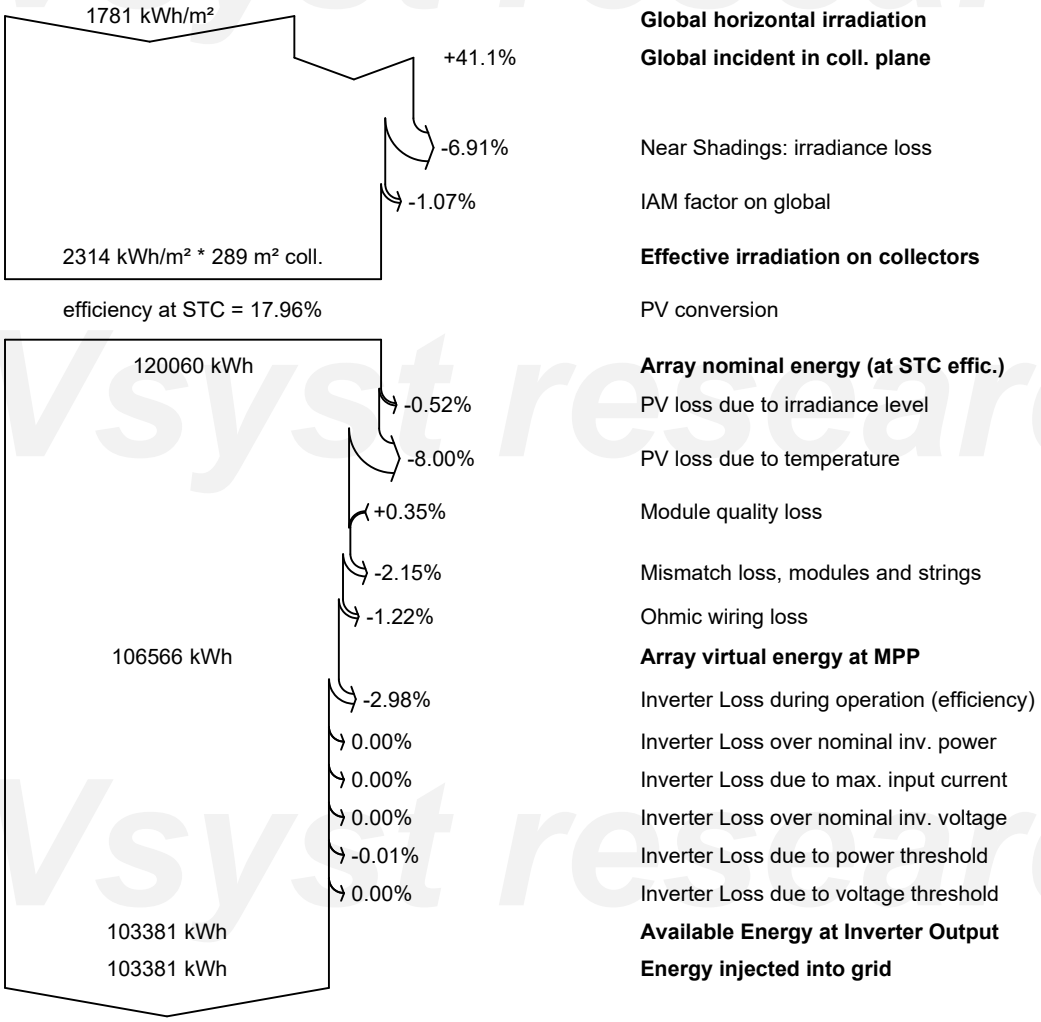
Balances and main results

	GlobHor kWh/m²	DiffHor kWh/m²	T_Amb °C	GlobInc kWh/m²	GlobEff kWh/m²	EArray kWh	E_Grid kWh	PR ratio
January	81.2	28.03	1.69	127.3	111.1	5522	5357	0.812
February	108.6	32.46	-0.42	164.1	147.4	7276	7075	0.832
March	142.7	55.33	5.08	197.8	179.7	8584	8333	0.813
April	197.1	56.45	9.87	280.4	261.0	12093	11747	0.808
May	195.2	72.55	13.83	258.6	241.5	10935	10605	0.791
June	209.8	67.86	21.86	278.0	262.9	11572	11217	0.778
July	211.3	68.73	24.14	275.8	261.0	11402	11050	0.773
August	194.5	68.72	23.50	261.7	245.4	10852	10520	0.775
September	155.8	43.00	20.31	224.5	208.0	9300	9020	0.775
October	126.1	30.14	12.96	193.3	175.0	8192	7951	0.793
November	84.5	25.42	9.39	132.6	117.7	5688	5515	0.802
December	74.1	23.40	5.14	119.2	103.8	5150	4992	0.808
Year	1781.0	572.09	12.35	2513.2	2314.5	106566	103381	0.794

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

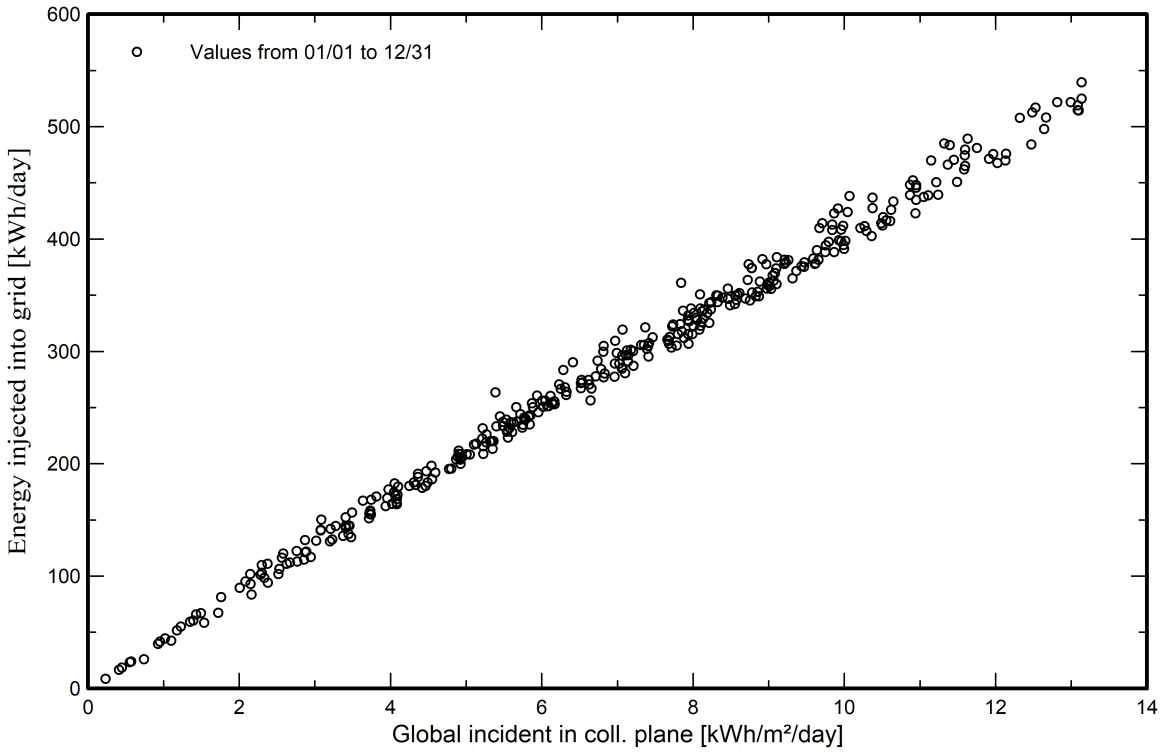
Loss diagram



PVsyst V7.3.4
VC1, Simulation date:
06/15/23 09:48
with v7.3.4

Predef. graphs

Daily Input/Output diagram



System Output Power Distribution