Version 7.4.8

PVsyst - Simulation report

Grid-Connected System

Project: report on shading analysis for solar projects.

Variant: report on shading analysis for solar project

No 3D scene defined, no shadings

System power: 5.04 kWp

Qaryah-ye Chaman-e Barakī - Afghanistan

Author

PVsyst V7.4.8
VC1, Simulation date:
10/28/24 11:22
with V7.4.8

Project summary

Geographical Site
Qaryah-ye Chaman-e Barakī
Afghanistan

Situation

Latitude	34.55 °N
Longitude	69.15 °E
Altitude	1793 m
Time zone	UTC+4.5

Project settings
Albedo 0.20

Weather data
Qaryah-ye Chaman-e Barakī
NASA-SSE satellite data 1983-2005 - Synthetic

System summary

Grid-Connected System

No 3D scene defined, no shadings

PV Field Orientation
Fixed plane
Tilt/Azimuth 34 / 0 °

Near Shadings
No Shadings

User's needs
Unlimited load (grid)

System information

PV Array		Inverters	
Nb. of modules	16 units	Nb. of units	1 unit
Pnom total	5.04 kWp	Pnom total	4950 W
		Pnom ratio	1.018

Results summary

Produced Energy	9622.75 kWh/year	Specific production	1909 kWh/kWp/year	Perf. Ratio PR	85.59 %

Table of contents

PVsyst V7.4.8
VC1, Simulation date:
10/28/24 11:22
with V7.4.8

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	34 / 0 °		Diffuse	Perez, Meteonorm
			Circumsolar	separate

Horizon
Average Height 3.2 °

Near Shadings
No Shadings

User's needs
Unlimited load (grid)

PV Array Characteristics

PV module

Manufacturer	Generic
Model	PM318B01_315
(Custom parameters definition)	
Unit Nom. Power	315 Wp
Number of PV modules	16 units
Nominal (STC)	5.04 kWp
Modules	2 string x 8 In series
At operating cond. (50°C)	
Pmpp	4567 Wp
U mpp	388 V
I mpp	12 A

Inverter

Manufacturer	Generic
Model	SUN2000-4.95KTL-JPL1
(Original PVsyst database)	
Unit Nom. Power	4.95 kWac
Number of inverters	2 * MPPT 50% 1 unit
Total power	5.0 kWac
Operating voltage	90-560 V
Max. power (=>40°C)	5.21 kWac
Pnom ratio (DC:AC)	1.02
No power sharing between MPPTs	

Total PV power

Nominal (STC)	5 kWp
Total	16 modules
Module area	26.1 m²
Cell area	23.4 m²

Total inverter power

Total power	5 kWac
Number of inverters	1 unit
Pnom ratio	1.02

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. 555 mΩ
Loss Fraction 1.5 % at STC

Module Quality Loss
Loss Fraction -0.8 %

Module mismatch losses
Loss Fraction 2.0 % at MPP

IAM loss factor
ASHRAE Param.: IAM = 1 - bo (1/cosi -1)
bo Param. 0.05

PVsyst V7.4.8
VC1, Simulation date:
10/28/24 11:22
with V7.4.8

Horizon definition

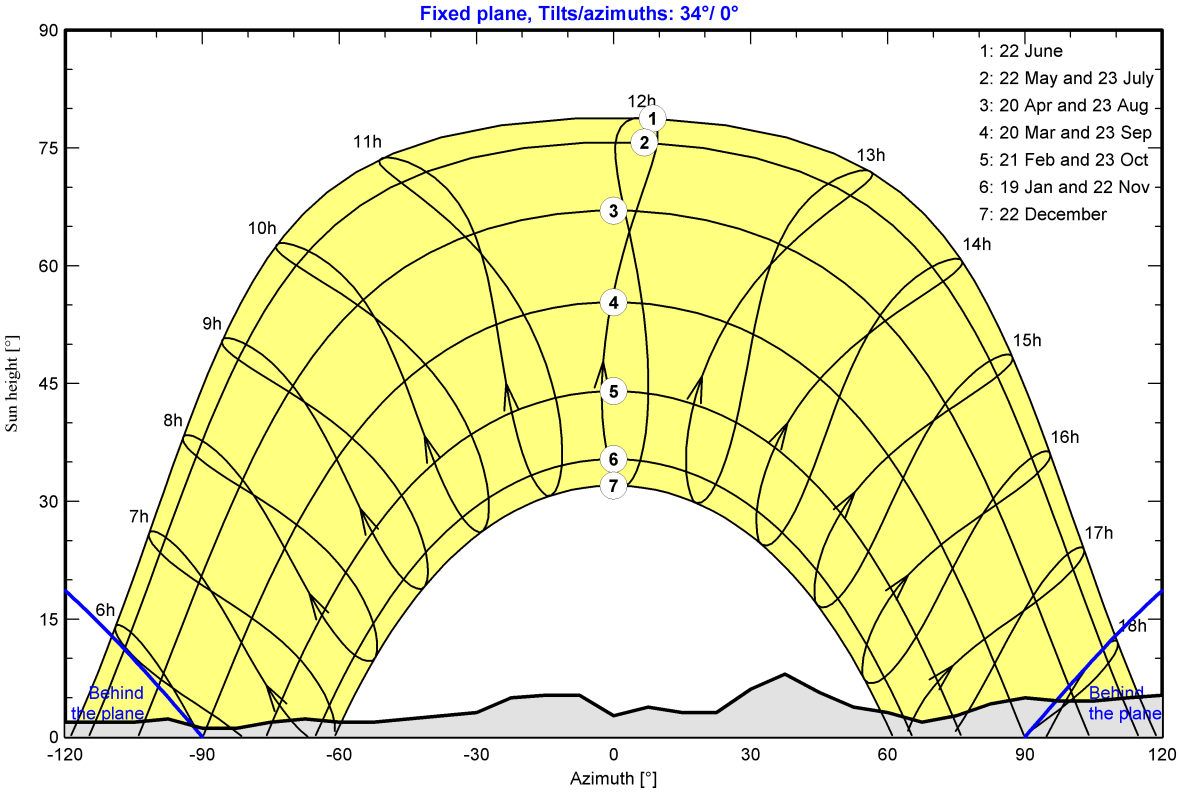
Horizon from PVGIS website API, Lat=34°32'45", Long=69°8'54", Alt=1793m

Average Height	3.2 °	Albedo Factor	0.80
Diffuse Factor	0.97	Albedo Fraction	100 %

Horizon profile

Azimuth [°]	-180	-173	-165	-158	-150	-143	-135	-128	-120	-105	-98	-90
Height [°]	2.7	1.9	2.3	2.7	2.3	1.9	1.9	2.3	1.9	1.9	2.3	1.1
Azimuth [°]	-83	-75	-68	-60	-53	-45	-38	-30	-23	-15	-8	0
Height [°]	1.1	1.9	2.3	1.9	1.9	2.3	2.7	3.1	5.0	5.3	5.3	2.7
Azimuth [°]	8	15	23	30	38	45	53	60	68	75	83	90
Height [°]	3.8	3.1	3.1	6.1	8.0	5.7	3.8	3.1	1.9	2.7	4.2	5.0
Azimuth [°]	98	105	113	120	128	135	143	150	158	165	173	180
Height [°]	4.6	4.6	5.0	5.3	4.2	3.8	4.2	3.4	2.7	1.9	1.9	2.7

Sun Paths (Height / Azimuth diagram)



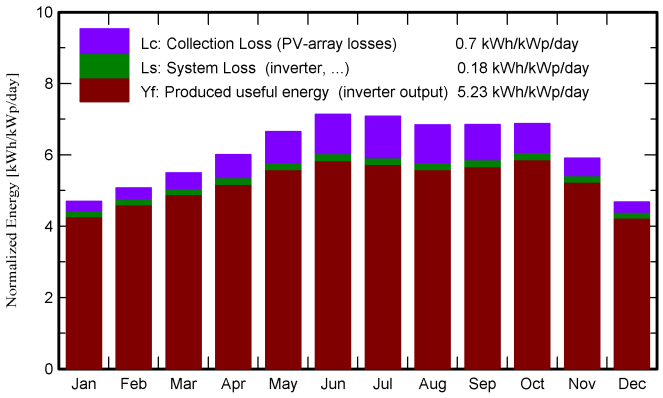
PVsyst V7.4.8
VC1, Simulation date:
10/28/24 11:22
with V7.4.8

Main results

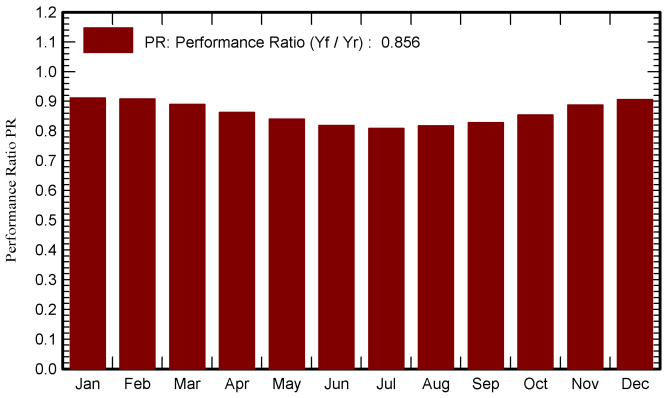
System Production

Produced Energy	9622.75 kWh/year	Specific production	1909 kWh/kWp/year
		Perf. Ratio PR	85.59 %

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	90.5	35.28	-3.36	145.5	139.9	693.1	668.1	0.911
February	101.1	40.83	-1.71	142.1	137.8	674.0	649.9	0.908
March	141.0	59.84	3.30	170.4	164.8	791.6	763.9	0.889
April	171.3	64.81	8.98	180.1	173.9	811.1	783.4	0.863
May	218.9	67.00	14.03	206.2	198.6	903.7	873.4	0.840
June	240.9	54.51	19.08	214.0	205.8	913.4	883.4	0.819
July	241.2	57.49	21.20	219.6	211.3	926.4	895.9	0.809
August	209.6	59.74	20.06	212.1	204.9	903.7	873.8	0.817
September	175.5	47.76	15.69	205.4	198.9	887.4	857.8	0.829
October	153.8	39.28	9.44	213.1	206.8	949.5	917.9	0.854
November	109.8	32.42	4.28	177.2	172.1	820.6	792.7	0.888
December	86.2	32.57	-0.60	145.1	140.2	687.3	662.5	0.906
Year	1939.7	591.52	9.26	2230.6	2155.1	9961.9	9622.7	0.856

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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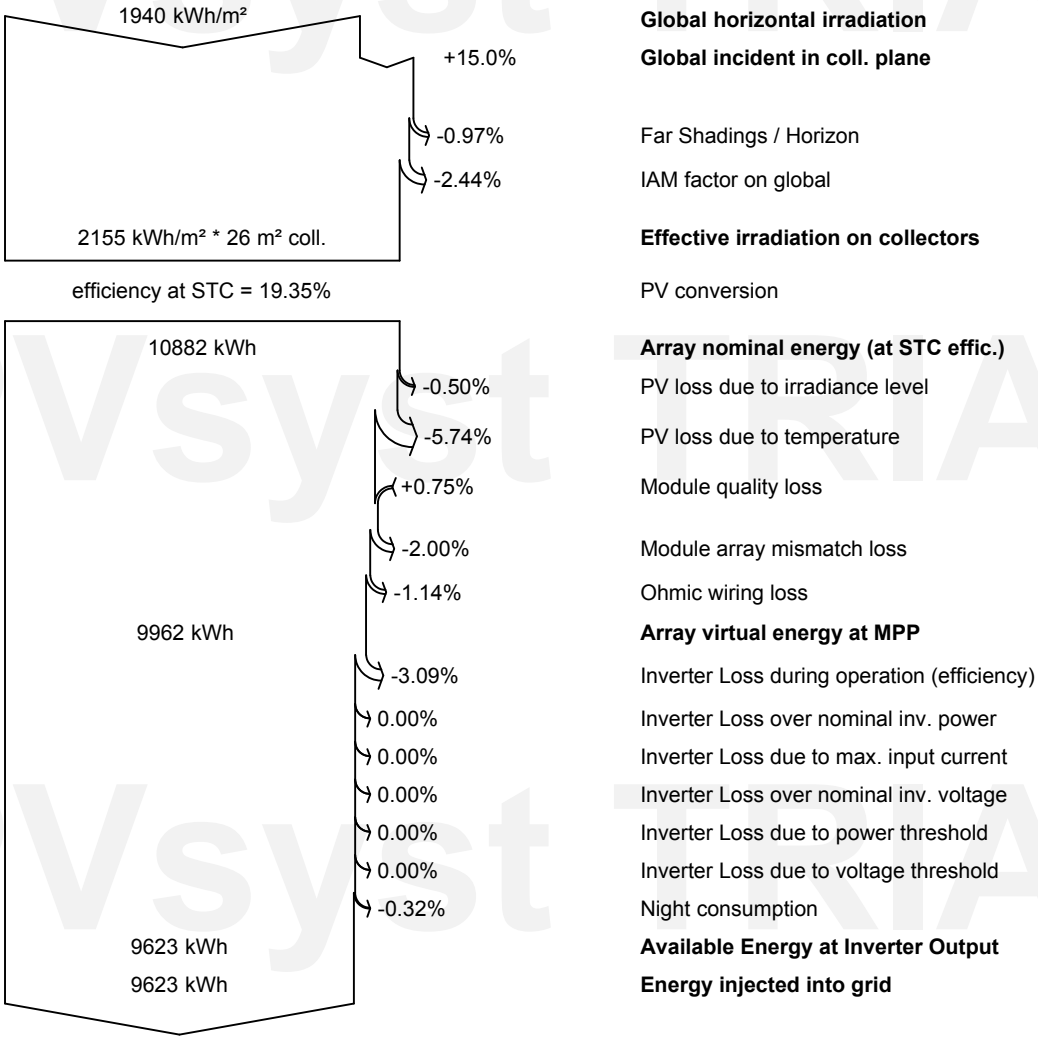
VC1, Simulation date:
10/28/24 11:22
with V7.4.8

Loss diagram



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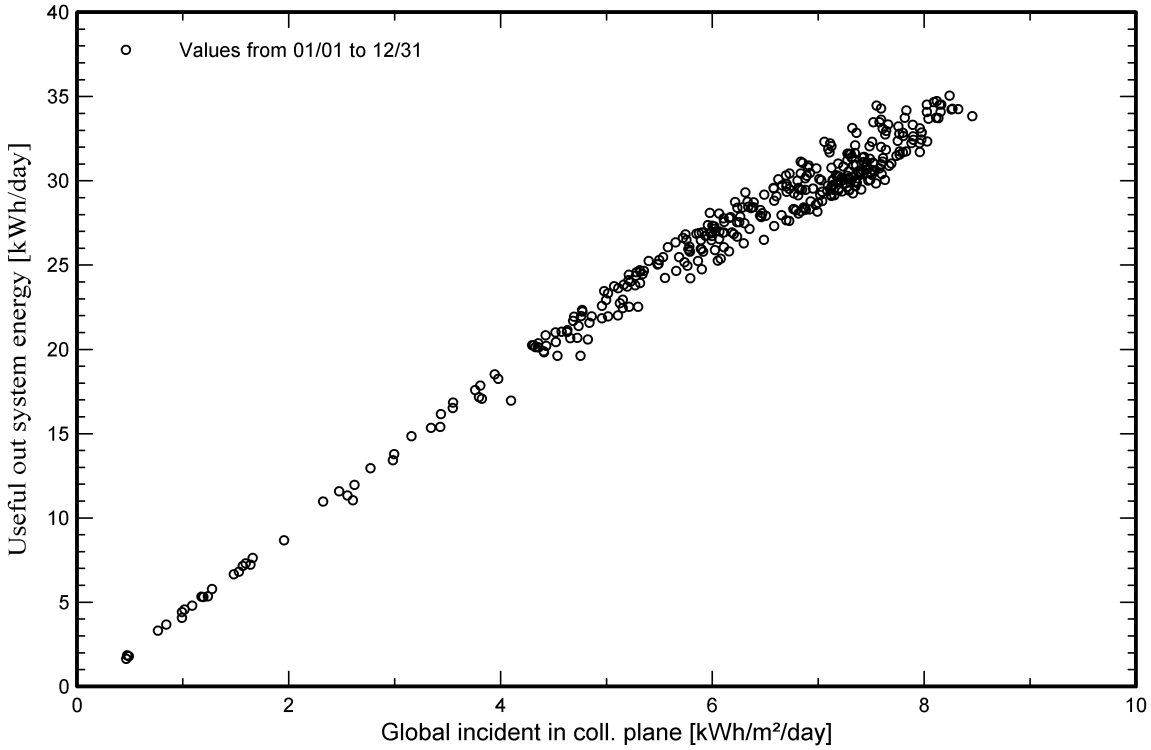
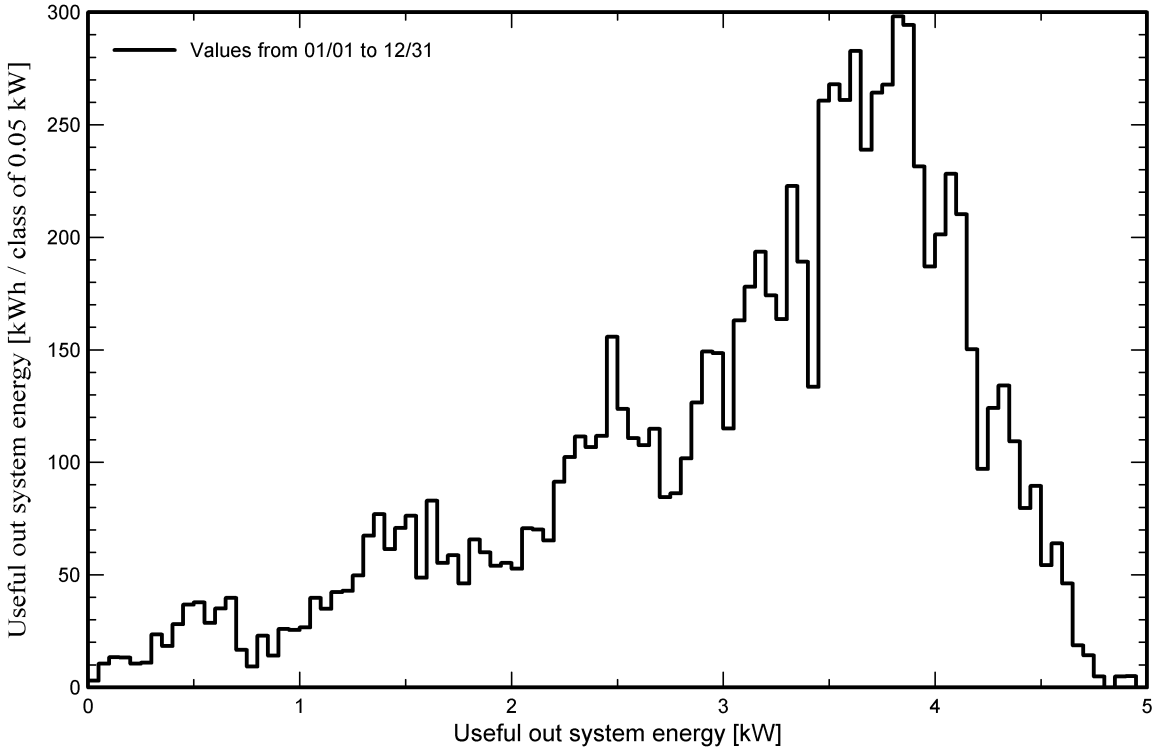
VC1, Simulation date:
10/28/24 11:22
with V7.4.8

Predef. graphs

Daily Input/Output diagram



System Output Power Distribution



Single-line diagram

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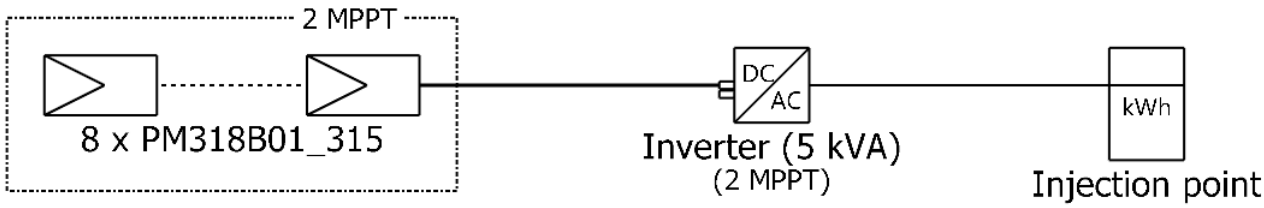
VC1, Simulation date:
10/28/24 11:22
with V7.4.8



PV module	PM318B01_315
Inverter	SUN2000-4.95KTL-JPL1
String	8 x PM318B01_315

	report on shading analysis for so lar projects	
	VC1 : report on shading analysis for so lar project	10/28/24