

PVsyst - Simulation report

Grid-Connected System

Project: SIMULACION_PROYECTO_1

Variant: Escena3D con sombras Potencia de 1.1KWp

Tables on a building

System power: 1100 Wp

Centro de Acondicionamiento Físico Moren - Costa Rica

Author

**PVsyst V7.2.15**

VC4, Simulation date:
03/06/22 18:11
with v7.2.15

Project summary**Geographical Site**

Centro de Acondicionamiento Físico Moren
Costa Rica

Situation

Latitude 9.85 °N
Longitude -83.91 °W
Altitude 1358 m
Time zone UTC-6

Project settings

Albedo 0.20

Meteo data

Centro de Acondicionamiento Físico Moren
PVGIS api TMY

System summary**Grid-Connected System****PV Field Orientation**

Fixed plane
Tilt/Azimuth 10 / 117 °

Tables on a building**Near Shadings**

Linear shadings

User's needs

Unlimited load (grid)

System information**PV Array**

Nb. of modules 5 units
Pnom total 1100 Wp

Inverters

Nb. of units 1 unit
Pnom total 1800 W
Pnom ratio 0.611

Results summary

Produced Energy 1588 kWh/year Specific production 1444 kWh/kWp/year Perf. Ratio PR 77.99 %

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General parameters

Grid-Connected System

Tables on a building

PV Field Orientation

Orientation

Fixed plane

Tilt/Azimuth 10 / 117 °

Sheds configuration

Models used

Transposition

Perez

Diffuse

Imported

Circumsolar

separate

Horizon

Free Horizon

Near Shadings

Linear 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)

P_{mpp}U_{mpp}I_{mpp}

Total PV power

Nominal (STC)

Total

Module area

Generic

CS6P-220

220 Wp

5 units

1100 Wp

1 String x 5 In series

990 Wp

131 V

7.6 A

1.10 kWp

5 modules

8.0 m²

Inverter

Manufacturer

Model

(Original PVsyst database)

Unit Nom. Power

Number of inverters

Total power

Operating voltage

P_{nom} ratio (DC:AC)

Generic

StarInverter PVP 1800

1.80 kWac

1 unit

1.8 kWac

120-360 V

0.61

Total inverter power

Total power

Number of inverters

P_{nom} ratio

1.8 kWac

1 unit

0.61

Array losses

Thermal Loss factor

Module temperature according to irradiance

U_c (const) 20.0 W/m²KU_v (wind) 0.0 W/m²K/m/s

DC wiring losses

Global array res.

290 mΩ

Loss Fraction

1.5 % at STC

Module Quality Loss

Loss Fraction

2.5 %

Module mismatch losses

Loss Fraction

2.0 % at MPP

Strings Mismatch loss

Loss Fraction

0.1 %

IAM loss factor

ASHRAE Param.: IAM = 1 - b₀ (1/cos i - 1)b₀ Param.

0.05

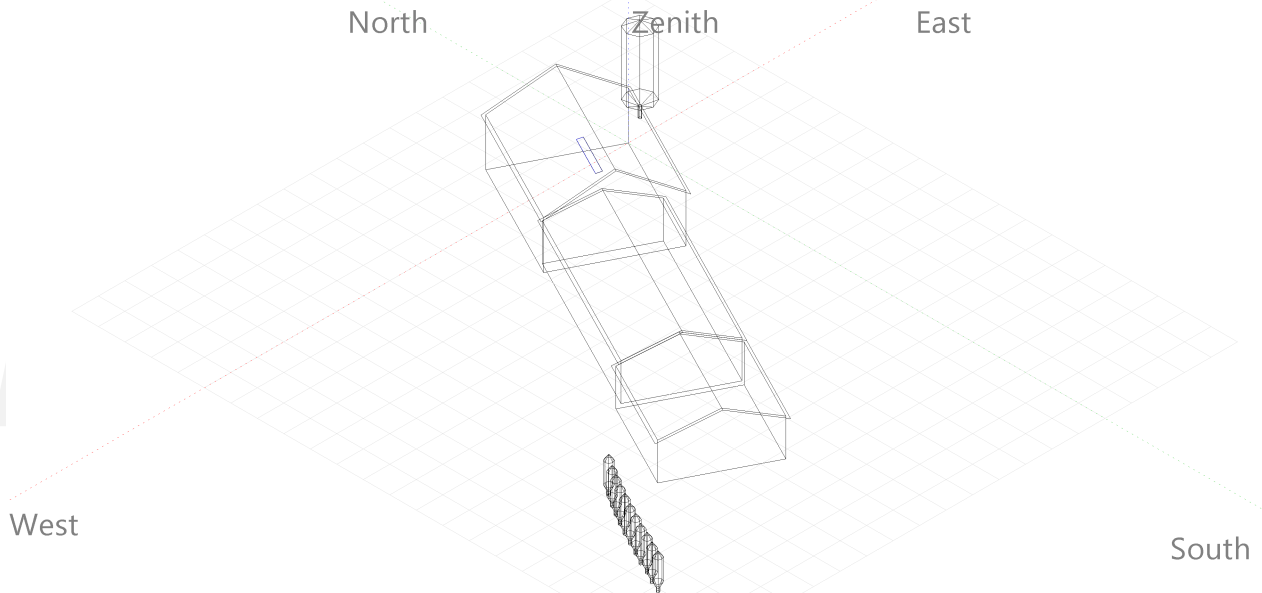


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Near shadings parameter

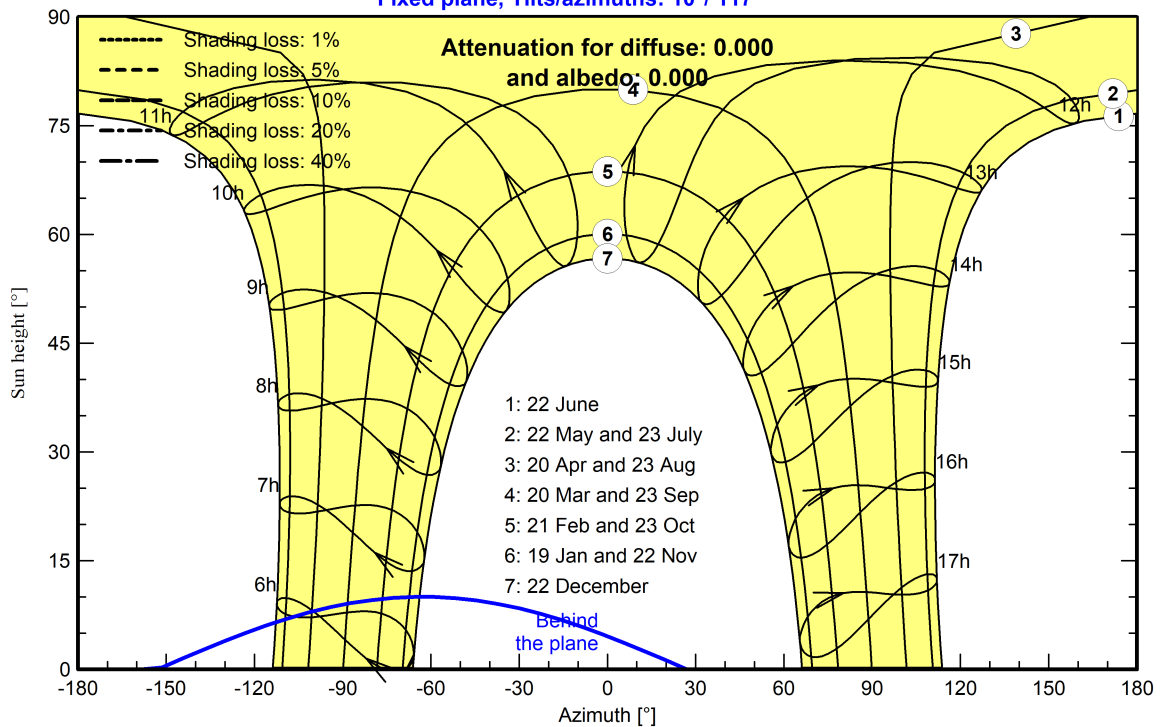
Perspective of the PV-field and surrounding shading scene



Iso-shadings diagram

Orientation #1

Fixed plane, Tilts/azimuths: 10°/ 117°





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Main results

System Production

Produced Energy

1588 kWh/year

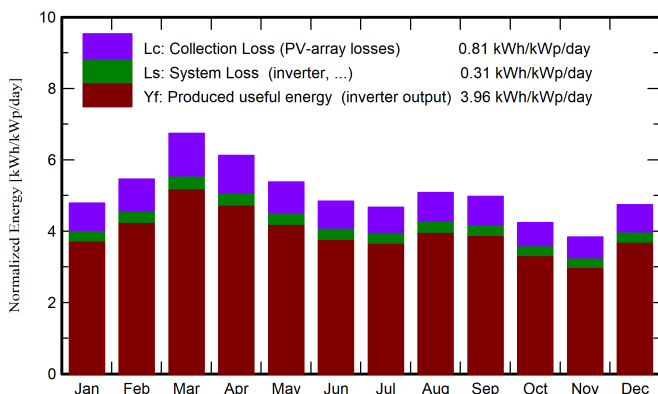
Specific production

1444 kWh/kWp/year

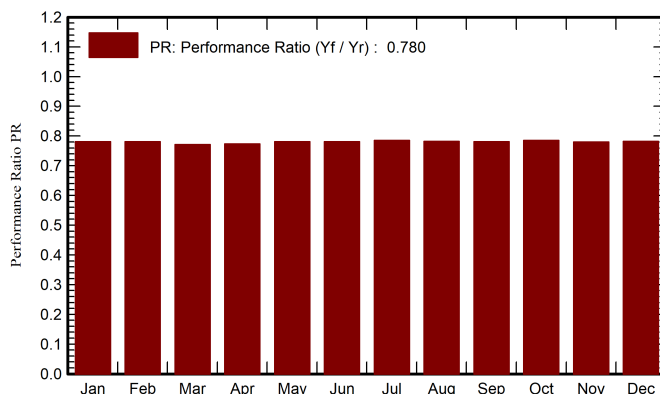
Performance Ratio PR

77.99 %

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	156.1	55.24	16.24	148.3	142.7	137.5	127.4	0.781
February	158.8	59.27	16.14	152.8	147.9	140.9	131.2	0.781
March	213.4	55.62	17.37	209.1	204.1	189.4	177.3	0.771
April	185.5	76.89	18.12	183.7	179.2	167.6	156.4	0.774
May	167.2	84.66	18.62	166.8	162.3	154.2	143.2	0.781
June	146.7	80.63	18.11	145.3	141.2	135.0	124.8	0.781
July	146.2	91.14	17.97	144.9	140.8	135.6	125.2	0.785
August	160.2	90.23	17.99	157.7	153.5	146.4	135.7	0.782
September	154.4	85.95	18.24	149.2	145.3	138.3	128.2	0.781
October	138.1	85.61	17.95	131.3	126.8	122.9	113.4	0.785
November	120.9	62.39	17.74	115.1	110.9	107.5	98.8	0.780
December	154.2	52.60	17.14	146.9	141.3	136.0	126.3	0.782
Year	1901.7	880.23	17.64	1851.0	1796.0	1711.3	1587.9	0.780

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

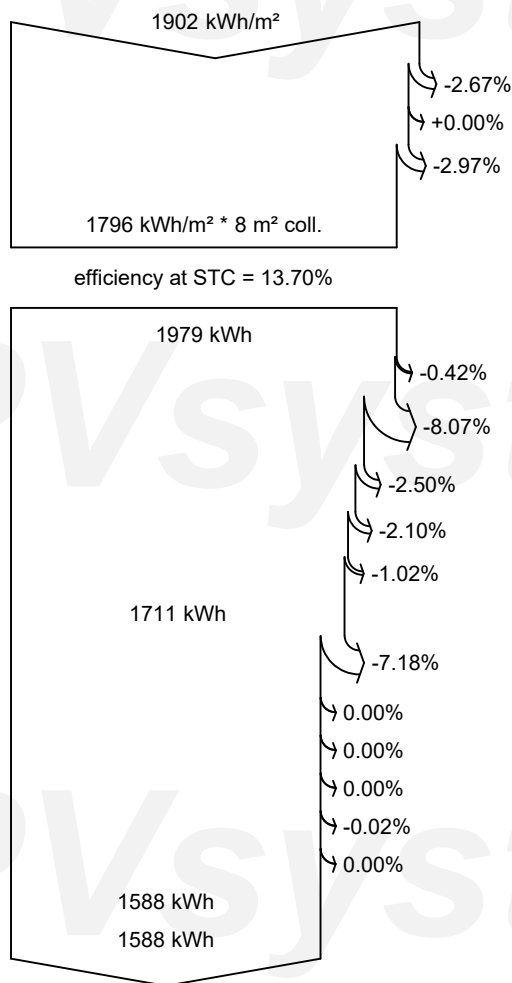
PR Performance Ratio



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Loss diagram



Global horizontal irradiation

Global incident in coll. plane

Near Shadings: irradiance loss

IAM factor on global

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

Mismatch loss, modules and strings

Ohmic wiring 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

Available Energy at Inverter Output

Energy injected into grid

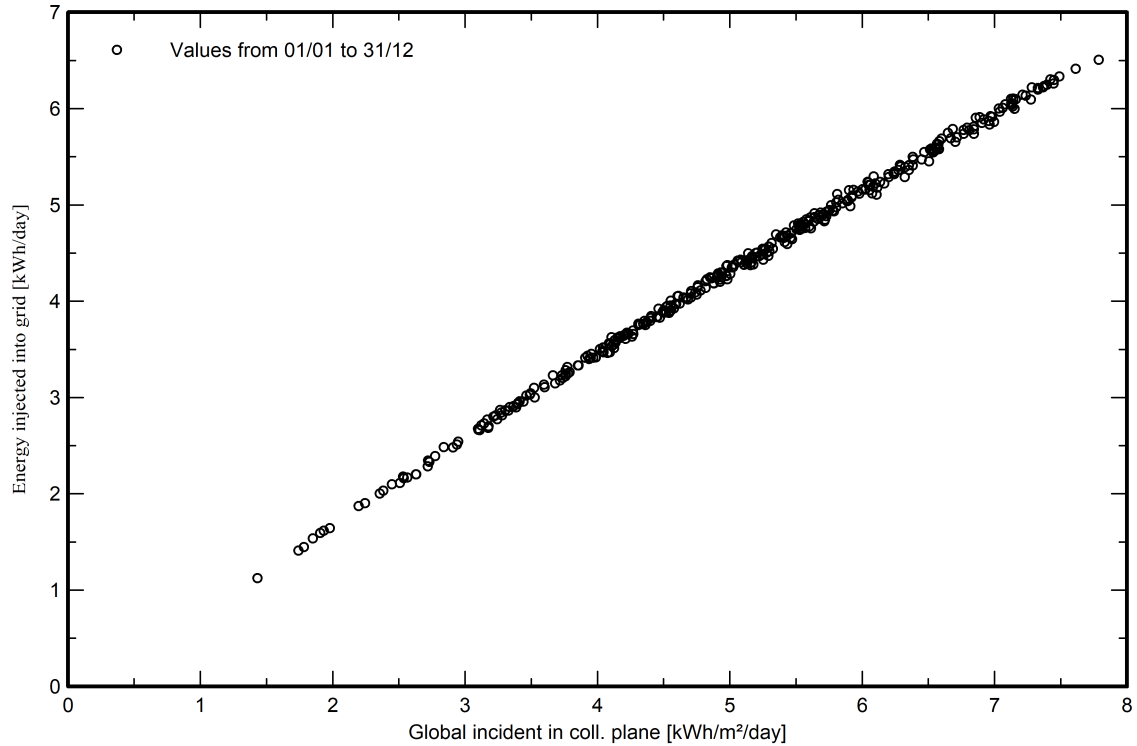


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Special graphs

Daily Input/Output diagram



System Output Power Distribution

