

PVsyst - Simulation report

Grid-Connected System

Project: Cliente 370 kwh/mes

Variant: Nueva variante de simulación

No 3D scene defined, no shadings

System power: 3540 Wp

Comuna 6 La Concordia - Colombia

**PVsyst V7.4.8**

VCO, Simulation date:
27/09/25 22:47
with V7.4.8

Project summary

Geographical Site
Comuna 6 La Concordia
Colombia

Situation
Latitude 7.11 °N
Longitude -73.12 °W
Altitude 965 m
Time zone UTC-5

Project settings
Albedo 0.20

Weather data

Comuna 6 La Concordia
Meteonorm 8.1 (2016-2021), Sat=100% - Sintético

System summary**Grid-Connected System**

No 3D scene defined, no shadings

PV Field Orientation

Fixed plane
Tilt/Azimuth 10 / 0 °

Near Shadings
No Shadings

User's needs
Unlimited load (grid)

System information**PV Array**

Nb. of modules 6 units
Pnom total 3540 Wp

Inverters

Nb. of units 1 unit
Pnom total 3000 W
Pnom ratio 1.180

Results summary

Produced Energy	5559.07 kWh/year	Specific production	1570 kWh/kWp/year	Perf. Ratio PR	82.16 %
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General parameters

Grid-Connected System

No 3D scene defined, no shadings

PV Field Orientation

Orientation

Fixed plane

Tilt/Azimuth 10 / 0 °

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

Generic

JAM78-S30-590-MR

(Original PVsyst database)

Unit Nom. Power

590 Wp

Number of PV modules

6 units

Nominal (STC)

3540 Wp

Modules

2 string x 3 In series

At operating cond. (50°C)

Pmpp

3230 Wp

U mpp

121 V

I mpp

27 A

Total PV power

Nominal (STC)

3.54 kWp

Total

6 modules

Module area

16.8 m²

Inverter

Manufacturer

Model

Generic

MIN 3000TL-XH-US

(Original PVsyst database)

Unit Nom. Power

3.00 kWac

Number of inverters

2 * MPPT 50% 1 unit

Total power

3.0 kWac

Operating voltage

50-550 V

Pnom ratio (DC:AC)

1.18

No power sharing between MPPTs

Total inverter power

Total power

3 kWac

Number of inverters

1 unit

Pnom ratio

1.18

Array losses

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.

76 mΩ

Loss Fraction

1.5 % at STC

Module Quality Loss

Loss Fraction

-0.8 %

Module mismatch losses

Loss Fraction

1.0 % 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	0.403	0.000



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Main results

System Production

Produced Energy 5559.07 kWh/year

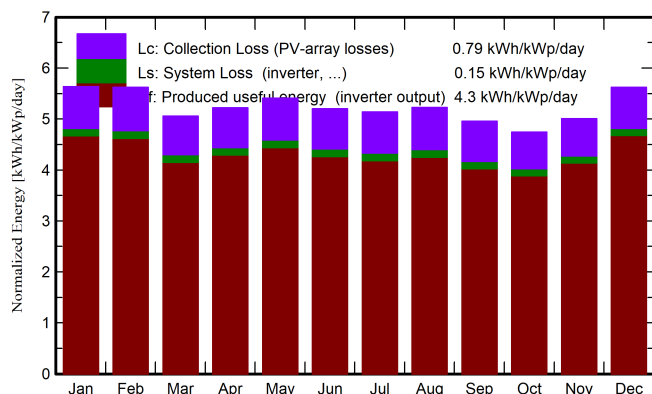
Specific production

1570 kWh/kWp/year

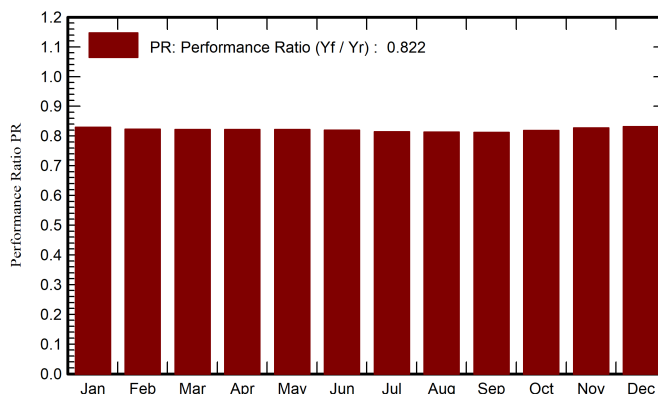
Perf. Ratio PR

82.16 %

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	162.1	68.21	25.94	174.7	170.2	528.6	512.9	0.829
February	149.9	61.91	26.23	157.4	153.1	473.2	458.7	0.823
March	154.7	72.66	26.70	156.8	152.3	472.4	456.1	0.821
April	160.2	71.12	26.61	156.7	151.7	472.1	456.2	0.822
May	176.7	75.36	27.47	167.6	161.8	504.1	487.8	0.822
June	167.6	63.04	27.19	156.2	150.4	469.3	453.3	0.820
July	170.1	61.93	27.77	159.3	153.0	475.9	459.3	0.815
August	167.9	65.88	28.33	162.1	156.8	483.7	467.0	0.814
September	149.0	71.47	28.09	148.8	144.1	443.1	427.8	0.812
October	142.7	72.58	27.68	147.1	142.6	441.9	426.6	0.819
November	141.2	69.97	26.19	150.3	145.4	454.6	440.0	0.827
December	160.0	65.63	26.18	174.3	169.4	528.8	513.4	0.832
Year	1902.3	819.76	27.04	1911.3	1850.7	5747.6	5559.1	0.822

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

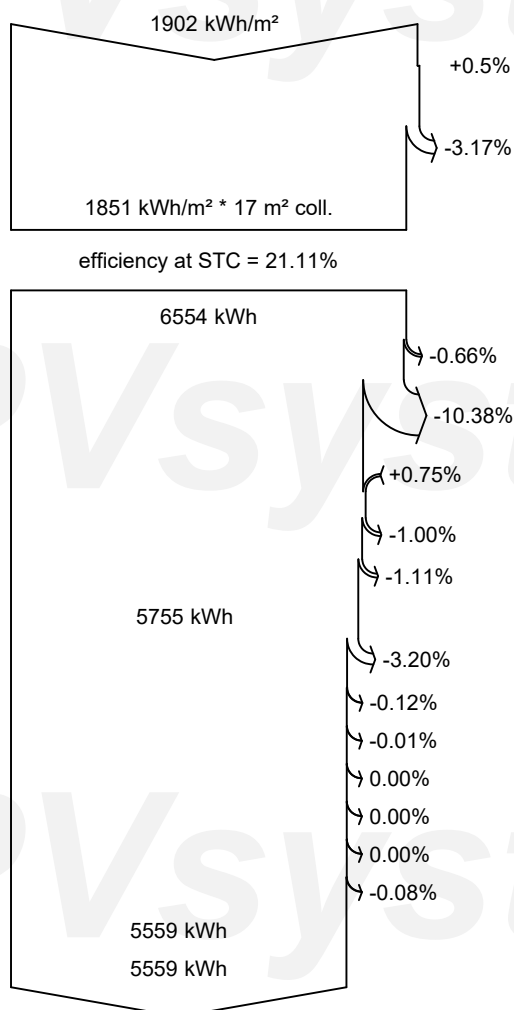
PR Performance Ratio



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Loss diagram



Global horizontal irradiation
Global incident in coll. plane

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

Module array mismatch loss

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

Night consumption

Available Energy at Inverter Output

Energy injected into grid



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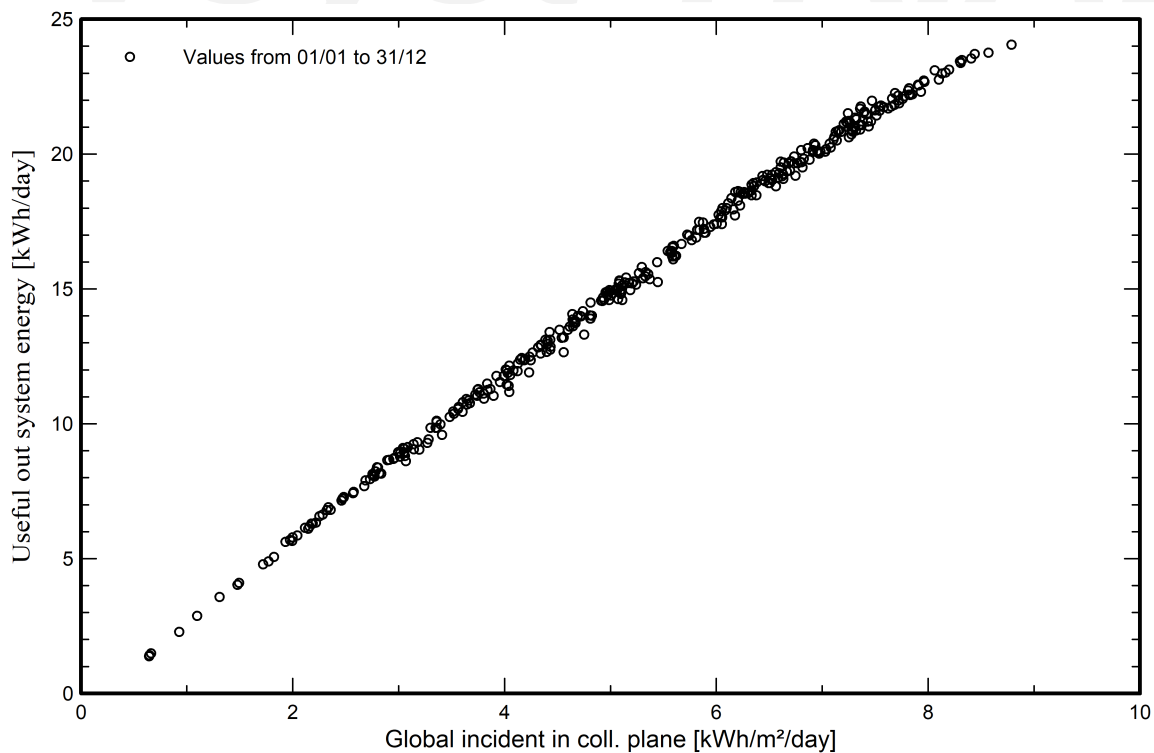
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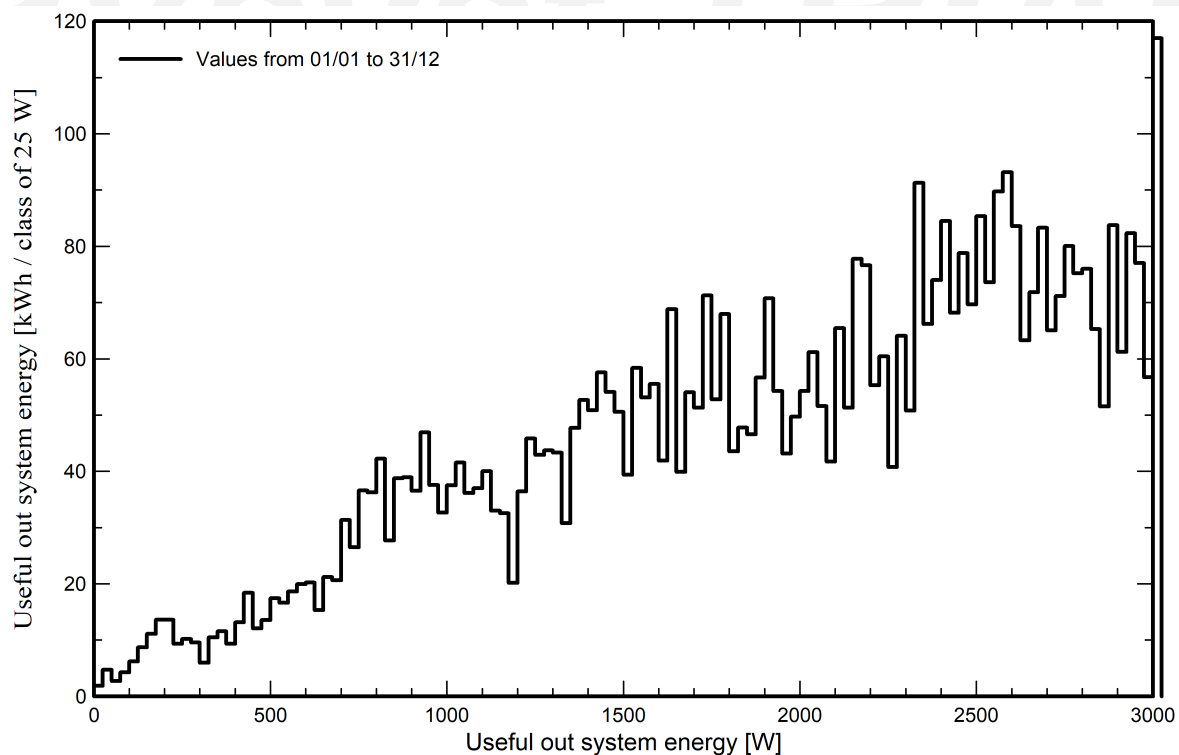
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Predef. graphs

Diagrama entrada/salida diaria



Distribución de potencia de salida del sistema





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P50 - P90 evaluation

Weather data

Source Meteonorm 8.1 (2016-2021), Sat=100%
Kind Monthly averages
Sintético - Multi-year average
Year-to-year variability(Variance) 6.7 %

Specified Deviation

Climate change 0.0 %

Global variability (weather data + system)

Variability (Quadratic sum) 6.9 %

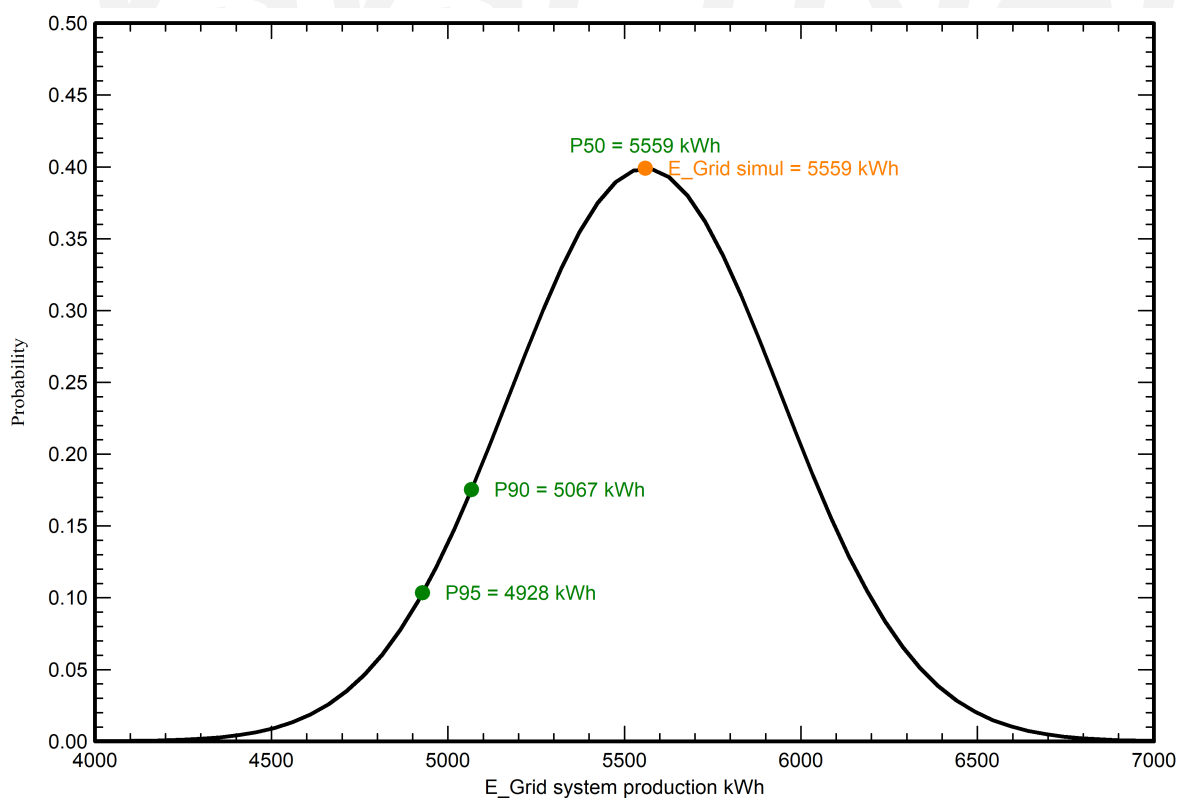
Simulation and parameters uncertainties

PV module modelling/parameters 1.0 %
Inverter efficiency uncertainty 0.5 %
Soiling and mismatch uncertainties 1.0 %
Degradation uncertainty 1.0 %

Annual production probability

Variability 384 kWh
P50 5559 kWh
P90 5067 kWh
P95 4928 kWh

Probability distribution

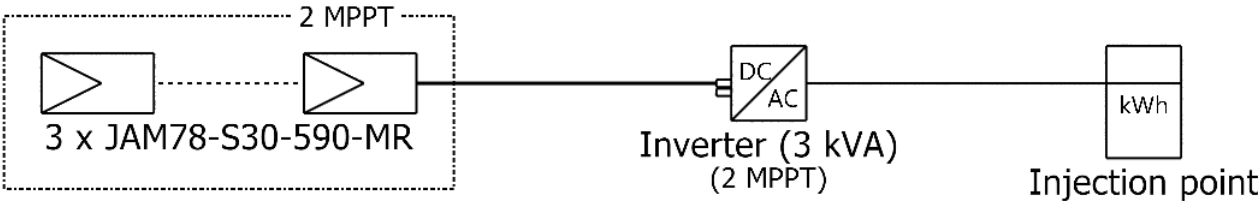




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Single-line diagram



PV module	JAM78-S30-590-MR
Inverter	MIN 3000TL-XH-US
String	3 x JAM78-S30-590-MR

mes

VC0 : Nueva variante de simulación

27/09/25



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Cost of the system

Installation costs

Item	Quantity units	Cost EUR	Total EUR
		Total	0.00
		Depreciable asset	0.00

Operating costs

Item	Total EUR/year
Total (OPEX)	0.00

System summary

Total installation cost	0.00 EUR
Operating costs	0.00 EUR/year
Produced Energy	5564 kWh/year
Cost of produced energy (LCOE)	0.0000 EUR/kWh



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CO₂ Emission Balance

Total: 13.9 tCO₂

Generated emissions

Total: 8.27 tCO₂

Source: Detailed calculation from table below

Replaced Emissions

Total: 25.5 tCO₂

System production: 5559.07 kWh/yr

Grid Lifecycle Emissions: 153 gCO₂/kWh

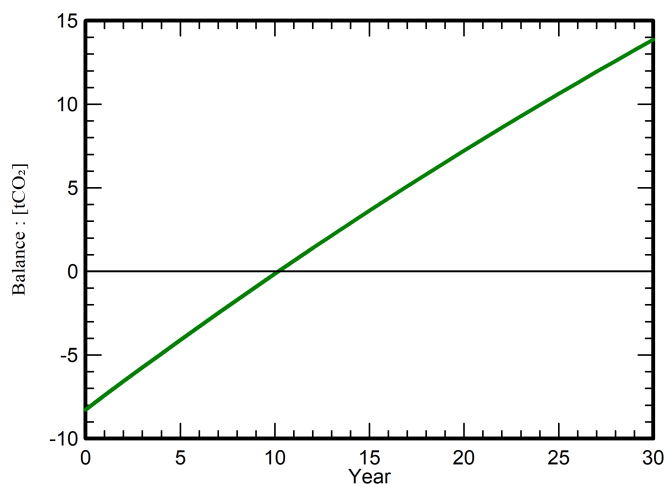
Source: IEA List

Country: Colombia

Lifetime: 30 years

Annual degradation: 1.0 %

Saved CO₂ Emission vs. Time



System Lifecycle Emissions Details

Item	LCE	Quantity	Subtotal
[kgCO ₂]			
Modules	1713 kgCO ₂ /kWp	4.72 kWp	8084
Supports	1.02 kgCO ₂ /kg	80.0 kg	81.6
Inverters	101 kgCO ₂ /	1.00	101