

PVsyst - Simulation report

Grid-Connected System

Project: Gabriel Fonseca y Cia Evento148176

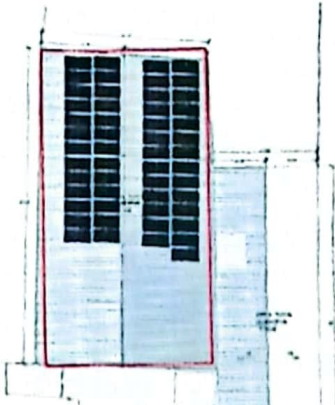
Variante: Simulación Colombia Compra Eficiente

localidad Antonio Nariño Colombia Compra Eficiente

System power: 29.20 kWp

Santiago Pérez - Colombia

1. GABRIEL FONSECA Y CIA SAS / CALZADO TAURO

Región en donde será instalado el Sistema Fotovoltaico	Bogotá D.C. (Región andina)
Área que dispone la entidad/sede para instalar el Sistema Fotovoltaico:	138 metros cuadrados
Tipo de instalación a realizar (si es en techo o piso)	Techo
Coordenadas geográficas en donde se hará la Instalación (latitud y longitud)	4°35'14"N 74°06'25"W
Fotografías, mapas o diagramas que la entidad considere necesarios para la elaboración del estudio por parte de los proveedores.	

JULIO DARÍO FUENTES
 GIMECOL SOLAR (Colombia)



Gimecol Solar



PVsyst V7.3.2

VC0, Simulation date:

13/04/23 16:28

with v7.3.2

Project: Gabriel Fonseca y Cia Evento148176

Variant: Nuova variante de simulación

GIMECOL SOLAR (Colombia)

Project summary

Geographical Site

Santiago Pérez

Colombia

Situation

Latitude 4.59 °N

Longitude -74.11 °W

Altitude 2585 m

Time zone UTC-5

Project settings

Albedo 0.20

Meteo data

Santiago Pérez

Meteonorm 8.1 (2016-2021), Sat=100% - Sintético

System summary

Grid-Connected System

localidad Antonio Nariño Colombia Compra Eficiente

PV Field Orientation

Fixed plane

Tilt/Azimuth 15 / 45 °

Near Shadings

No Shadings

User's needs

Monthly values

System information

PV Array

Nb. of modules

73 units

Pnom total

29.20 kWp

Inverters

Nb. of units

73 units

Pnom total

21.17 kWac

Pnom ratio

1.379

Results summary

Produced Energy 41633 kWh/year

Used Energy 40360 kWh/year

Specific production

1426 kWh/kWp/year

Perf. Ratio PR

83.83 %

Solar Fraction SF

39.89 %

Table of contents

Cover page	1
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
Cost of the system	8
CO ₂ Emission Balance	9



General parameters

Grid-Connected System

localidad Antonio Nariño Colombia Compra Eficiente

PV Field Orientation

Orientation

Fixed plane

Tilt/Azimuth 15 / 45 °

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

Monthly values

Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Year	
2.15	2.58	3.45	3.39	2.36	3.15	3.25	3.38	3.48	3.89	3.98	5.30	40.4	MWh/mth

PV Array Characteristics

PV module

Manufacturer

JA Solar

Model

JAM72-S10-400-PR

(Original PVsyst database)

Unit Nom. Power

400 Wp

Number of PV modules

73 units

Nominal (STC)

29.20 kWp

Modules

73 Strings x 1 in series

At operating cond. (50°C)

Pmpp

26.64 kWp

U mpp

37 V

I mpp

714 A

Total PV power

Nominal (STC)

29 kWp

Total

73 modules

Module area

147 m²

Inverter

Manufacturer

Enphase

Model

IQ7PLUS-72-x-208

(Original PVsyst database)

Unit Nom. Power

0.290 kWac

Number of Inverters

73 units

Total power

21.2 kWac

Operating voltage

16-48 V

Max. power (≥60°C)

0.300 kWac

Pnom ratio (DC:AC)

1.38

Total inverter power

Total power

21.2 kWac

Max. power

21.9 kWac

Number of inverters

73 units

Pnom ratio

1.38

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.

0.87 mΩ

Loss Fraction

1.5 % at STC

Module Quality Loss

Loss Fraction

-0.8 %

Module mismatch losses

Loss Fraction

0.0 % at MPP

Strings Mismatch loss

Loss Fraction

0.1 %

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



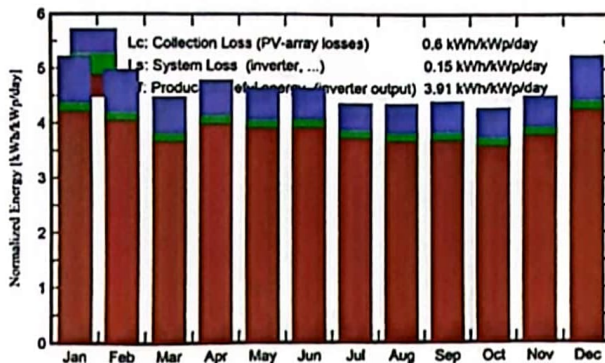
Main results

System Production

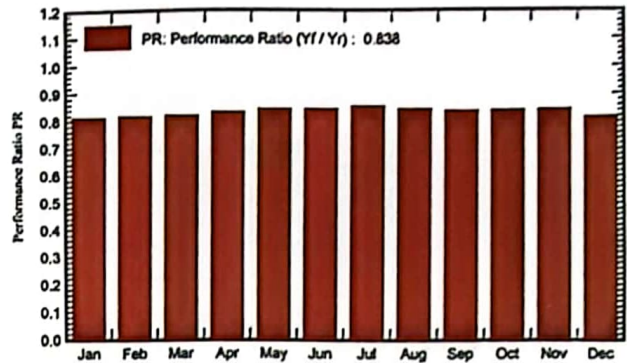
Produced Energy 41633 kWh/year
Used Energy 40360 kWh/year

Specific production 1426 kWh/kWp/year
Performance Ratio PR 83.83 %
Solar Fraction SF 39.89 %

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_User kWh	E_Solar kWh	E_Grid kWh	EFrGrid kWh
January	153.1	66.82	13.20	161.6	156.7	3987	2150	892	2948	1258
February	134.1	54.79	13.51	139.3	135.2	3466	2580	1063	2273	1517
March	140.4	68.68	13.75	139.1	134.4	3485	3450	1378	1975	2072
April	149.7	65.85	13.78	143.8	139.2	3661	3390	1350	2173	2040
May	156.4	66.82	13.95	144.2	138.9	3714	2360	998	2579	1362
June	152.9	64.20	13.49	139.7	134.0	3602	3150	1321	2147	1829
July	148.6	67.87	13.58	135.5	129.8	3539	3250	1322	2086	1928
August	146.3	77.54	13.51	135.2	129.9	3485	3380	1376	1980	2004
September	135.6	67.51	13.18	132.1	128.0	3386	3480	1394	1865	2086
October	132.6	78.29	13.44	132.8	128.4	3407	3890	1528	1754	2362
November	132.6	68.57	13.40	135.1	130.6	3473	3980	1498	1848	2482
December	153.2	65.76	13.37	162.5	157.8	4034	5300	1979	1907	3321
Year	1735.4	812.69	13.51	1700.8	1642.9	43239	40360	16098	25535	24262

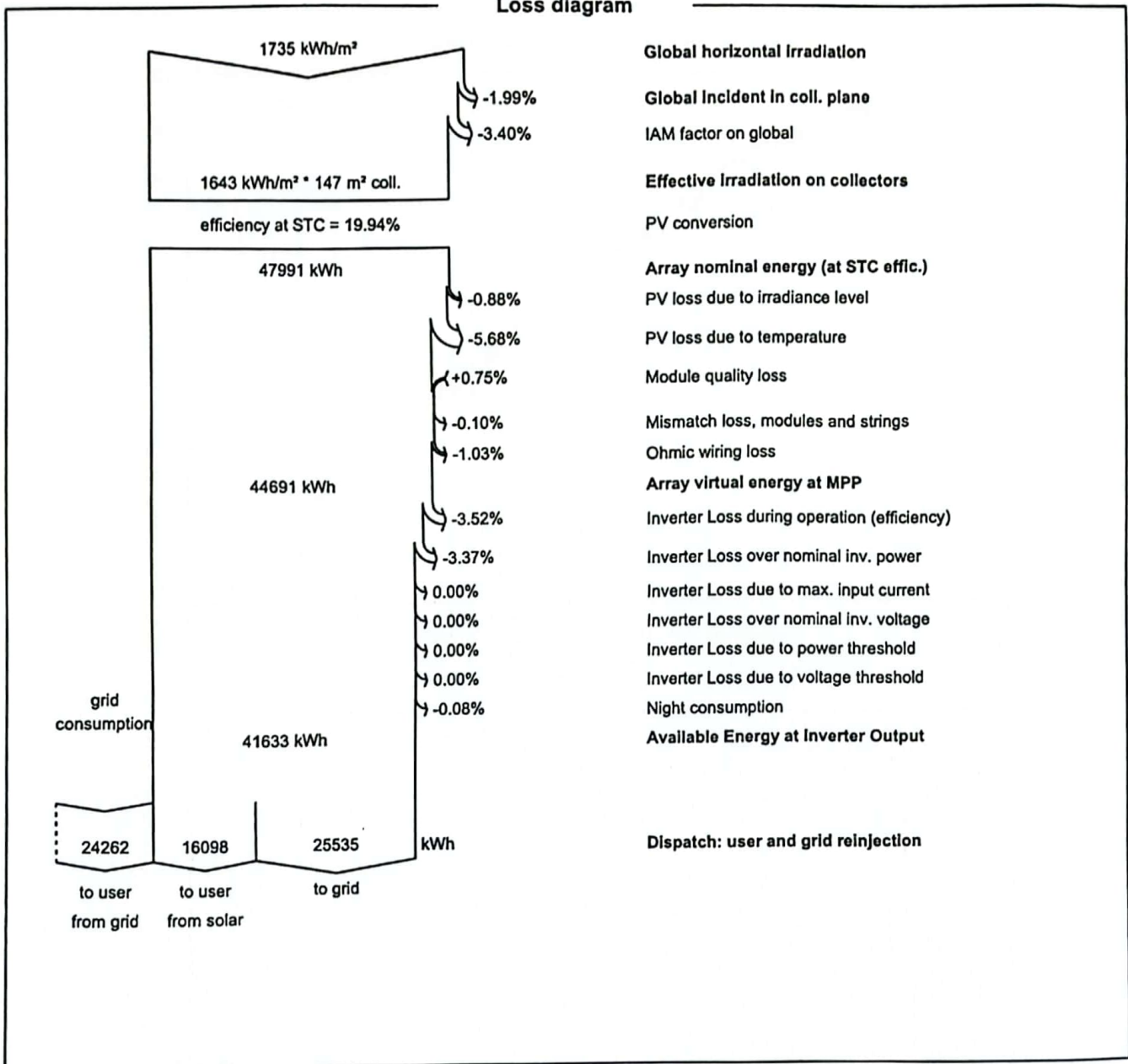
Legends

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_User Energy supplied to the user
E_Solar Energy from the sun
E_Grid Energy injected into grid
EFrGrid Energy from the grid



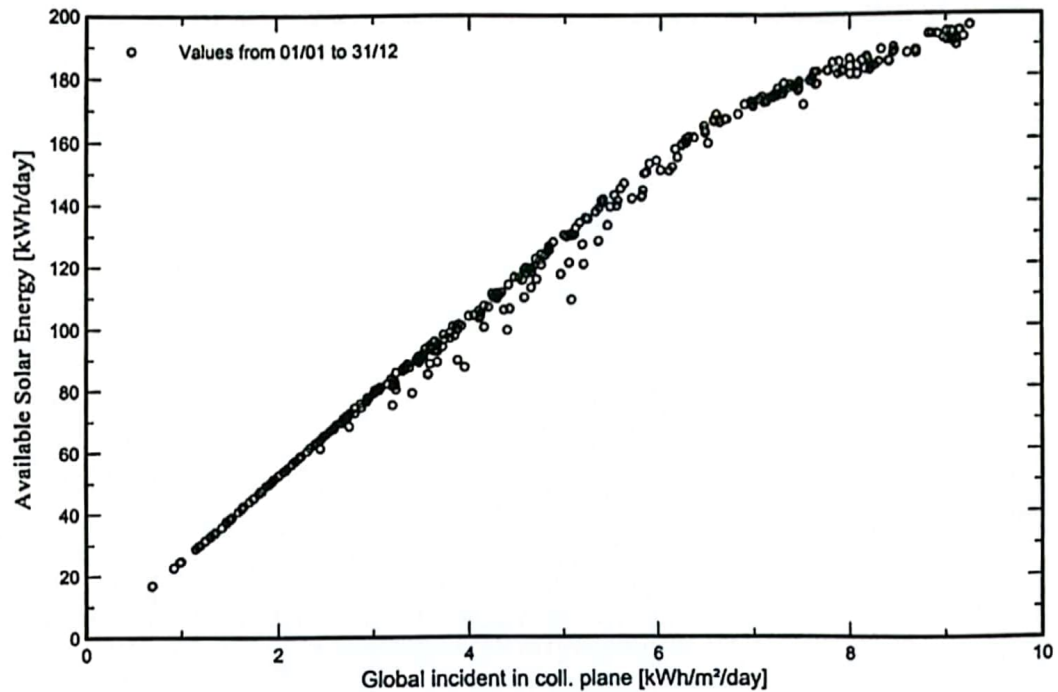
Loss diagram



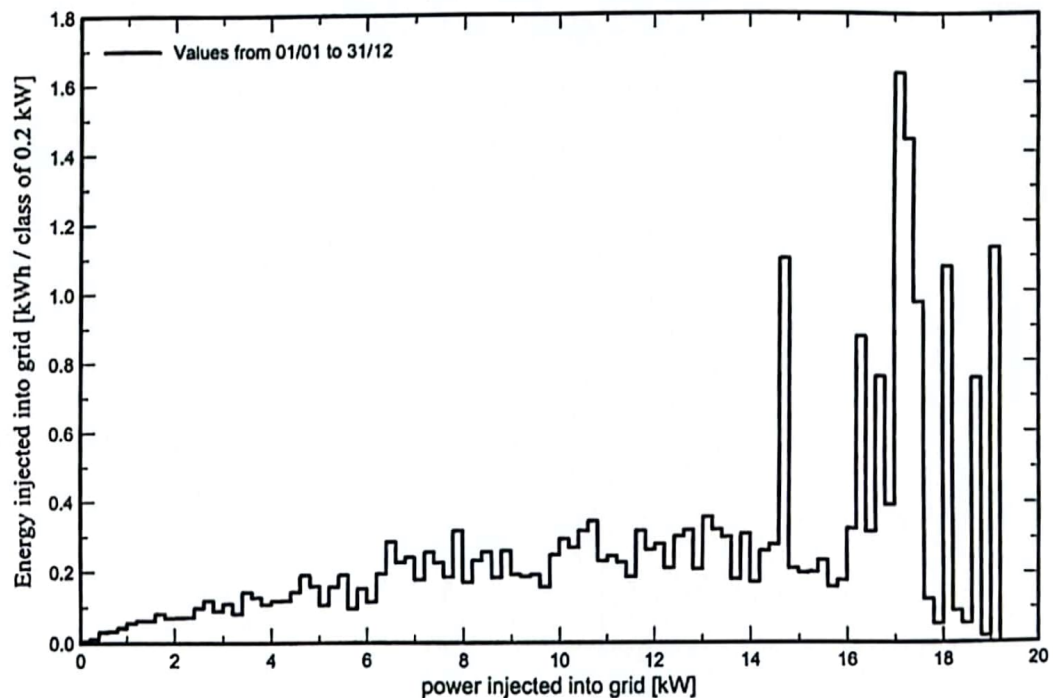


Predef. graphs

Diagrama entrada/salida diaria



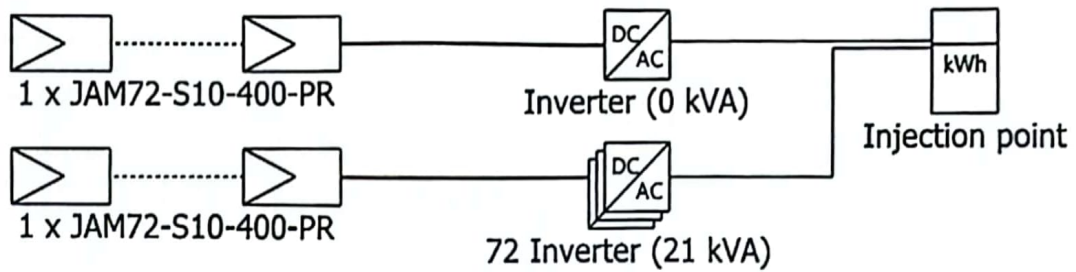
Distribución de potencia de salida del sistema





PVsyst V7.3.2
VC0, Simulation date:
13/04/23 16:28
with v7.3.2

Single-line diagram



PV module	JAM72-S10-400-PR
Inverter	IQ7PLUS-72-x-208
String	1 x JAM72-S10-400-PR

Gabriel Fonseca y Cia Evento148 176	GIMECOL SOLAR (Colombia)
VC0 : Nueva variante de simulación	13/04/23



PVsyst V7.3.2
VC0, Simulation date:
13/04/23 16:28
with v7.3.2

Project: Gabriel Fonseca y Cia Evento148176

Variant: Nueva variante de simulación

GIMECOL SOLAR (Colombia)

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
Unused energy	16.1 MWh/year
Energy sold to the grid	25.5 MWh/year
Cost of produced energy (LCOE)	0.000 EUR/kWh

CO₂ Emission BalanceTotal: 107.8 tCO₂

Generated emissions

Total: 58.14 tCO₂

Source: Detailed calculation from table below

Replaced Emissions

Total: 191.2 tCO₂

System production: 41.67 MWh/yr

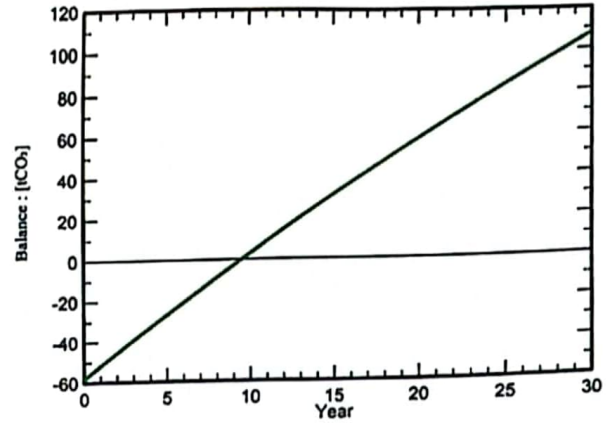
Grid Lifecycle Emissions: 153 gCO₂/kWh

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	29.2 kWp	50011
Supports	1.02 kgCO ₂ /kg	730 kg	745
Inverters	101 kgCO ₂ /	73.0	7380