

PVsyst - Simulation report

Grid-Connected System

Project: Proyecto

Variant: VARIANTE 2 HOTEL BARI TAURO 50KW Y GROWATT 30KW

Tables on a building

System power: 86.1 kWp

HBari - Colombia



Project: Proyecto

Variant: VARIANTE 2 HOTEL BARI TAURO 50KW Y GROWATT 30KW

PVsyst V8.0.21

VC1, Simulation date:
15/04/26 11:02
with V8.0.21

Project summary

Geographical Site

HBarí
Colombia

Situation

Latitude 7.12 °(N)
Longitude -73.11 °(W)
Altitude 1000 m
Time zone UTC-5

Project settings

Albedo 0.20

Weather data

HBarí
Meteonorm 8.2 (2016-2021), Sat=100% - Sintético

System summary

Grid-Connected System

Orientation #1

Fixed plane

Tilt/Azimuth 8 / -8.6 °

System information

PV Array

Nb. of modules 118 units
Pnom total 86.1 kWp

Tables on a building

Near Shadings

Detailed electrical calculation
acc. to module layout : Slow (simul.)

User's needs

Unlimited load (grid)

Inverters

Nb. of units 2 units
Total apparent power 50 kVA
Total active power 30 kWac
Pnom ratio 1.08

Results summary

Produced Energy	134.08 MWh/year	Specific production	1556 kWh/kWp/year	Perf. Ratio PR	80.66 %
Apparent energy	137.04 MVAh/year				

Table of contents

Project and results summary	2
General parameters, PV Array Characteristics, System losses	3
Horizon definition	6
Near shading definition - Iso-shadings diagram	7
Main results	8
Loss diagram	9
Predef. graphs	10



PVsyst V8.0.21

VC1, Simulation date:
15/04/26 11:02
with V8.0.21

General parameters

Grid-Connected System

Orientation #1

Fixed plane

Tilt/Azimuth 8 / -8.6 °

Near Shadings

Detailed electrical calculation
acc. to module layout : Slow (simul.)

Grid injection point

Power factor

Cos(phi) (lagging) 0.950

Tables on a building

Models used

Transposition Perez
Diffuse Perez, Meteonorm
Circumsolar separate

Horizon

Average Height 5.0 °

User's needs

Unlimited load (grid)

PV Array Characteristics

Array #1 - TAURO50KW

PV module

Manufacturer Generic
Model ZXM8-GPLDD132-730
(Custom parameters definition)
ZXM8-GPLDD132-730.PAN
Unit Nom. Power 730 Wp
Number of PV modules 75 units
Nominal (STC) 54.8 kWp
Modules 5 string x 15 In series

At operating cond. (50°C)

Pmpp 50.6 kWp
U mpp 572 V
I mpp 89 A

PV module

Manufacturer Generic
Model ZXM8-GPLDD132-730
(Custom parameters definition)
ZXM8-GPLDD132-730.PAN
Unit Nom. Power 730 Wp

Array #2 - 30KW

Number of PV modules 28 units
Nominal (STC) 20.44 kWp
Modules 2 string x 14 In series

At operating cond. (50°C)

Pmpp 18.91 kWp
U mpp 534 V
I mpp 35 A

Array #3 - Subconjunto #3

Number of PV modules 15 units
Nominal (STC) 10.95 kWp
Modules 1 strings x 15 In series

At operating cond. (50°C)

Pmpp 10.13 kWp
U mpp 572 V
I mpp 18 A

Inverter

Manufacturer Generic
Model Tauro Eco 50-3-D 208-220
(Custom parameters definition)
Unit Nom. Power 50.0 kVA
Number of inverters 1 unit
Total power 50.0 kVA
Operating voltage 500-850 V
Pnom ratio (DC:AC) 1.10
Leading limit Cos(phi) min 0.100
Lagging limit Cos(phi) min 0.100

Inverter

Manufacturer Generic
Model MAC 30KTL3-XL
(Original PVsyst database)
Unit Nom. Power 30.0 kWac

Number of inverters 2 * MPPT 33% 0.7 unit
Total power 20.0 kWac

Operating voltage 200-650 V
Pnom ratio (DC:AC) 1.02
No power sharing between MPPTs

Number of inverters 1 * MPPT 33% 0.3 unit
Total power 10.0 kWac

Operating voltage 200-650 V
Pnom ratio (DC:AC) 1.10



PVsyst V8.0.21

VC1, Simulation date:
15/04/26 11:02
with V8.0.21

PV Array Characteristics

Total PV power

Nominal (STC)	86 kWp
Total	118 modules
Module area	367 m ²
Cell area	343 m ²

Total inverter power

Inverter PNom limit mixed, 63% apparent power	
Total apparent power	50 kVA
Total active power	30 kWac
Nb. of inverters	2 units
	0.0 unused
Pnom ratio	1.08
No power sharing	

Array losses

Array Soiling Losses

Loss Fraction	3.0 %
---------------	-------

Thermal Loss factor

Module temperature according to irradiance	
Uc (const)	29.0 W/m ² K
Uv (wind)	0.0 W/m ² K/m/s

Serie Diode Loss

Voltage drop	0.7 V
Loss Fraction	0.1 % at STC

LID - Light Induced Degradation

Loss Fraction	1.27 %
---------------	--------

Module Quality Loss

Loss Fraction	-1.25 %
---------------	---------

Module mismatch losses

Array #1 - TAURO50KW

Loss Fraction	2.00 % at MPP
---------------	---------------

Array #2 - 30KW

Loss Fraction	2.00 % at MPP
---------------	---------------

Array #3 - Subconjunto #3

Loss Fraction	2.00 % at MPP
---------------	---------------

IAM loss factor

Incidence effect (IAM): Fresnel, AR coating, n(glass)=1.526, n(AR)=1.290

0°	30°	50°	60°	70°	75°	80°	85°	90°
1.000	0.999	0.987	0.963	0.892	0.814	0.679	0.438	0.000

DC wiring losses

Global wiring resistance	7.7 mΩ
Loss Fraction	0.18 % at STC

Array #1 - TAURO50KW

Global array res.	13 mΩ
Loss Fraction	0.18 % at STC

Array #2 - 30KW

Global array res.	29 mΩ
Loss Fraction	0.18 % at STC

Array #3 - Subconjunto #3

Global array res.	63 mΩ
Loss Fraction	0.18 % at STC

System losses

Unavailability of the system

Time fraction	0.5 %
	2.0 days,
	2 periods



PVsyst V8.0.21

VC1, Simulation date:
15/04/26 11:02
with V8.0.21

AC wiring losses

Inv. output line up to injection point

Inverter voltage	220 Vac tri
Loss Fraction	1.03 % at STC

Inverters: Tauro Eco 50-3-D 208-220, MAC 30KTL3-XL

Wire section (2 Inv.)	Copper 2 x 3 x 95 mm ²
Average wires length	63 m



PVsyst V8.0.21

VC1, Simulation date:
15/04/26 11:02
with V8.0.21

Horizon definition

Horizon from Meteonorm web service, Lat=7°6'58", Long=-73°6'30"

Average Height	5.0 °	Albedo Factor	0.87
Diffuse Factor	0.98	Albedo Fraction	100 %

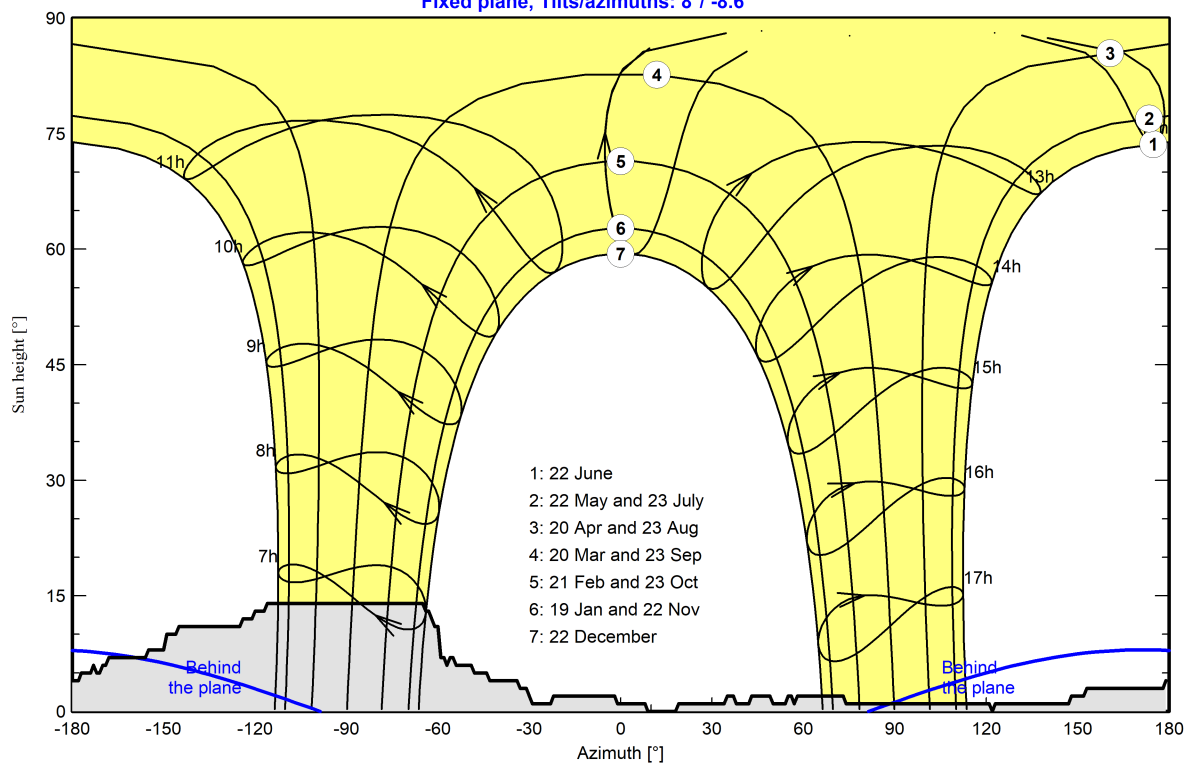
Horizon profile

Azimuth [°]	-180	-178	-177	-173	-171	-170	-168	-156	-155	-146	-145	-125	-124	-120
Height [°]	4.0	4.0	5.0	6.0	5.0	6.0	7.0	7.0	8.0	10.0	11.0	11.0	12.0	13.0
Azimuth [°]	-117	-116	-65	-63	-61	-60	-59	-57	-56	-55	-54	-48	-44	-43
Height [°]	13.0	14.0	14.0	13.0	11.0	11.0	7.0	6.0	7.0	7.0	6.0	5.0	5.0	4.0
Azimuth [°]	-34	-31	-29	-23	-22	-1	8	9	18	34	35	37	38	43
Height [°]	4.0	3.0	1.0	1.0	2.0	1.0	1.0	0.0	0.0	1.0	2.0	2.0	1.0	2.0
Azimuth [°]	49	50	54	56	57	58	73	121	122	147	152	153	178	179
Height [°]	2.0	1.0	1.0	2.0	1.0	2.0	2.0	1.0	0.0	1.0	2.0	3.0	3.0	4.0

Sun Paths (Height / Azimuth diagram)

Orientation #1

Fixed plane, Tilts/azimuths: 8°/-8.6°



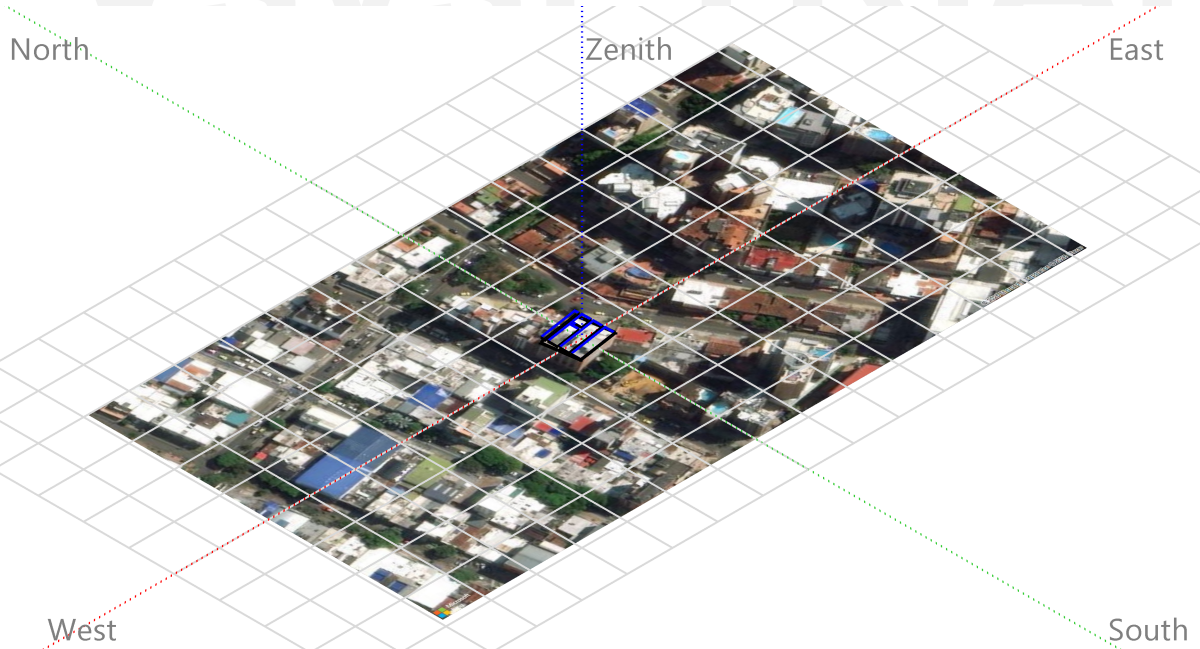


PVsyst V8.0.21

VC1, Simulation date:
15/04/26 11:02
with V8.0.21

Near shadings parameter

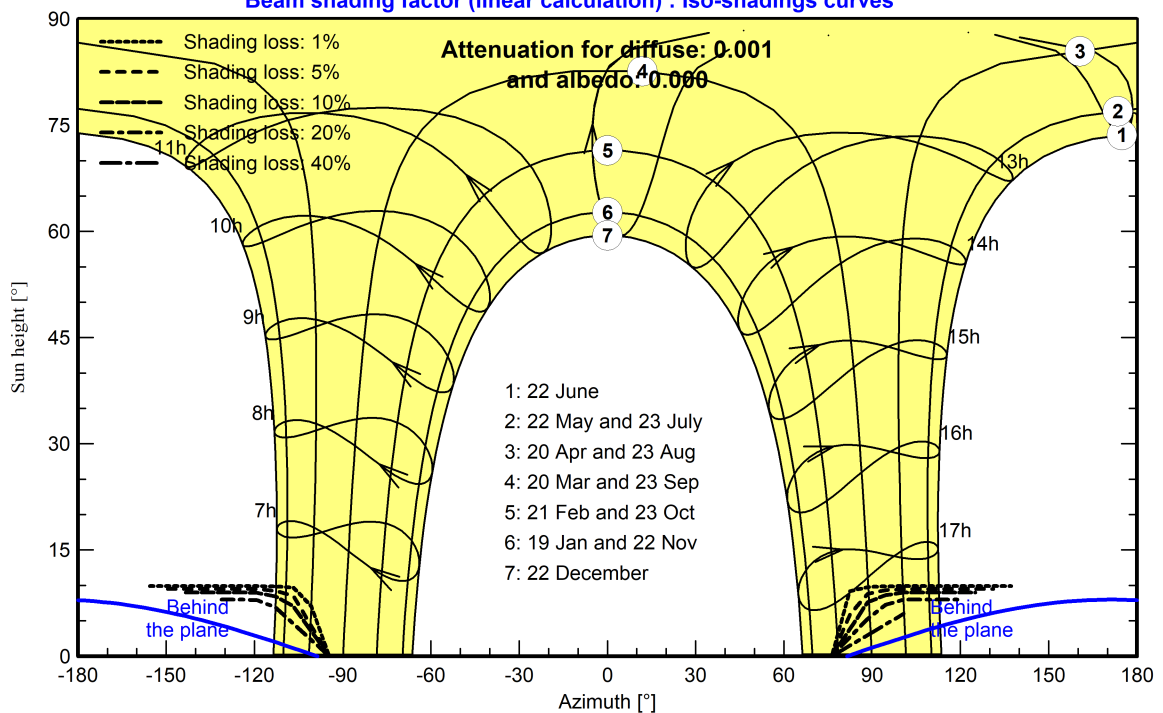
Perspective of the PV-field and surrounding shading scene



Iso-shadings diagram

Orientation #1 - Fixed plane, Tilts/azimuths: 8°/-8.6°

Beam shading factor (linear calculation) : Iso-shadings curves





Project: Proyecto

Variant: VARIANTE 2 HOTEL BARI TAURO 50KW Y GROWATT 30KW

PVsyst V8.0.21

VC1, Simulation date:
15/04/26 11:02
with V8.0.21

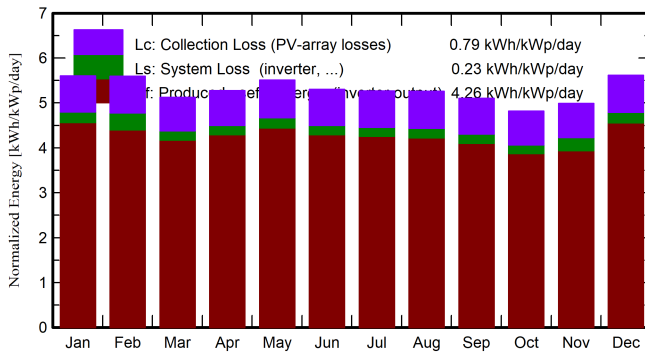
Main results

System Production

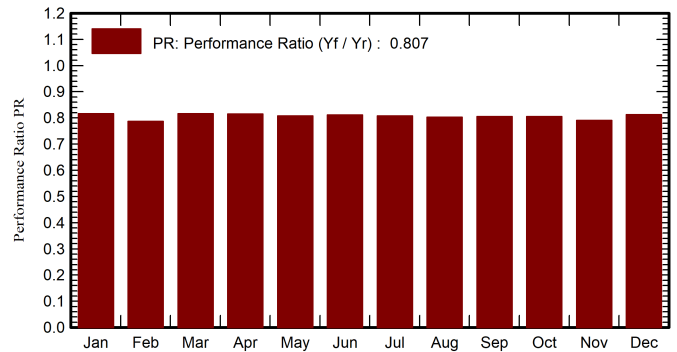
Produced Energy 134.08 MWh/year
Apparent energy 137.04 MVAh/year

Specific production 1556 kWh/kWp/year
Perf. Ratio PR 80.66 %

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 MWh	E_Grid MWh	PR ratio
January	163.1	68.03	25.84	173.6	163.5	12.82	12.20	0.816
February	150.5	61.63	26.14	156.7	147.7	11.54	10.63	0.787
March	156.8	82.07	26.60	158.8	149.6	11.71	11.16	0.816
April	160.3	81.62	26.51	158.2	148.2	11.63	11.10	0.815
May	177.6	62.56	27.47	170.8	160.1	12.49	11.88	0.808
June	167.5	68.35	27.10	159.0	148.4	11.63	11.11	0.812
July	171.6	64.78	27.68	163.4	152.6	11.92	11.37	0.808
August	167.7	62.00	28.23	163.0	152.7	11.85	11.28	0.803
September	153.2	70.28	27.99	153.0	143.3	11.14	10.61	0.805
October	145.3	69.48	27.69	149.3	139.7	10.87	10.36	0.806
November	142.3	74.06	26.10	149.7	139.3	10.94	10.19	0.790
December	161.6	58.52	26.08	174.1	163.4	12.81	12.18	0.812
Year	1917.5	823.40	26.96	1929.6	1808.4	141.35	134.08	0.807

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

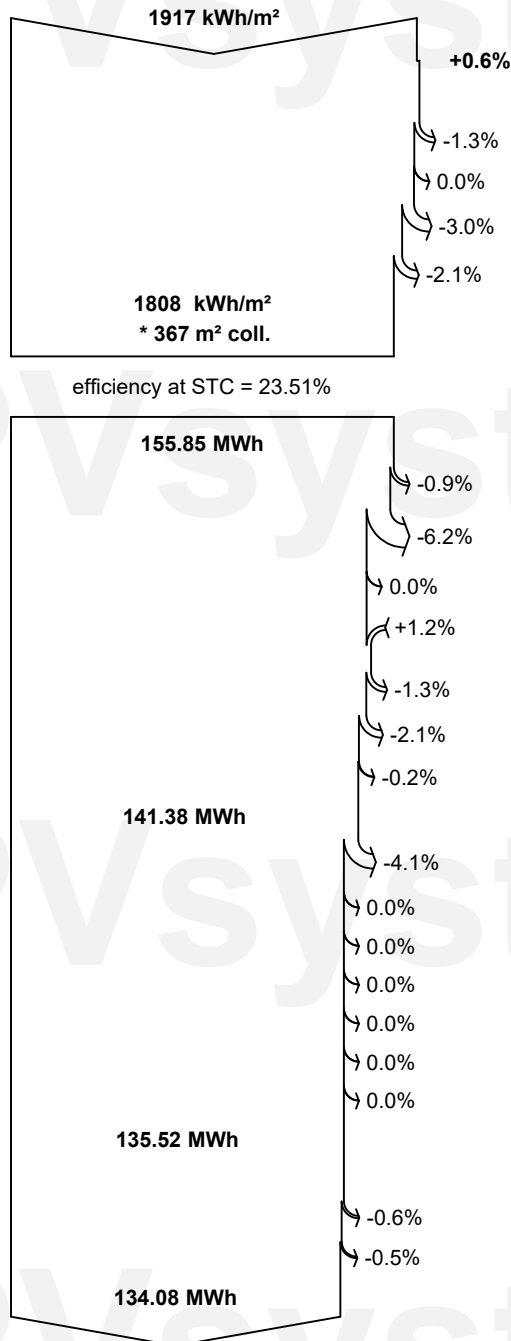
EArray Effective energy at the output of the array
E_Grid Energy injected into grid
PR Performance Ratio



PVsyst V8.0.21

VC1, Simulation date:
15/04/26 11:02
with V8.0.21

Loss diagram



Global horizontal irradiation

Global incident in coll. plane

Far Shadings / Horizon

Near Shadings: irradiance loss

Soiling loss factor

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

Shadings: Electrical Loss detailed module calc.

Module quality loss

LID - Light induced degradation

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

Night consumption

Available Energy at Inverter Output

AC ohmic loss

System unavailability

Active Energy injected into grid

Reactive energy to the grid, Yearly effective cos(Phi) = 0.978

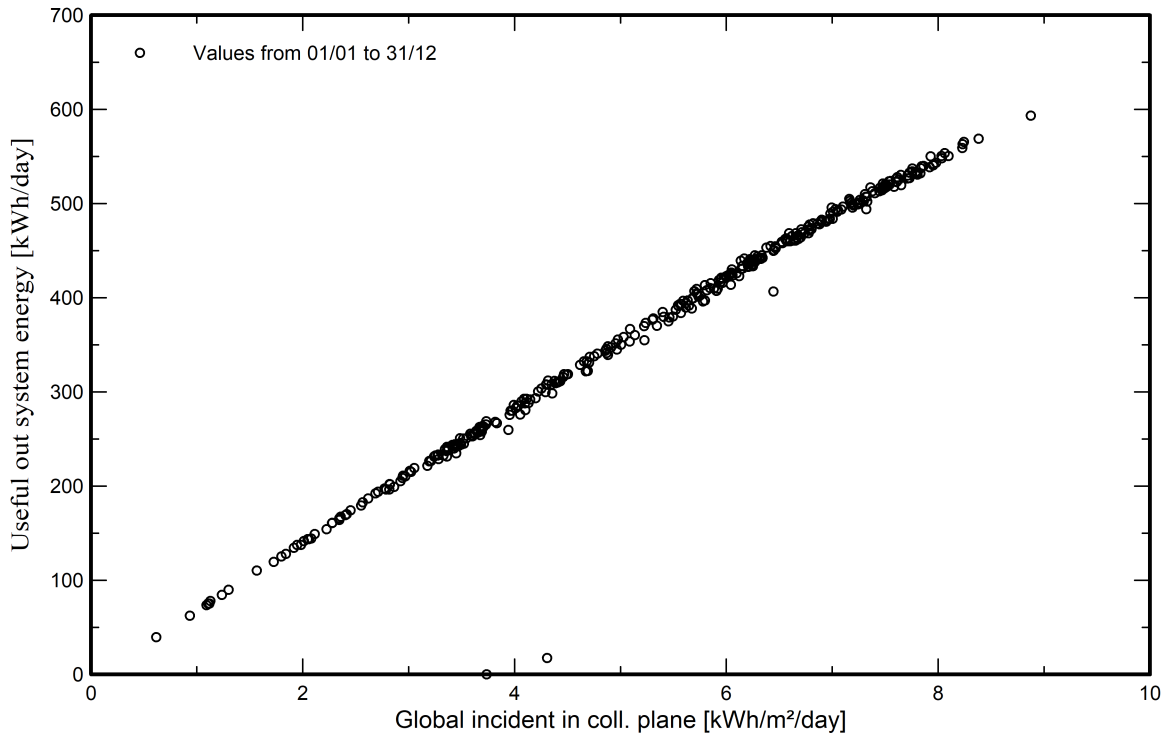
Apparent energy to the grid



PVsyst V8.0.21

VC1, Simulation date:
15/04/26 11:02
with V8.0.21

Predef. graphs
Daily Input/Output diagram



System Output Power Distribution

