Version 7.2.16

PVsyst - Simulation report

Grid-Connected System

Project: Kopellis_ 2 Axis

Variant: 114 kW pitch 10m ns individual

Tracking system

System power: 114 kWp

Thessaloniki/Livadákion - Greece

Author

PVsyst V7.2.16
VC2, Simulation date:
09/07/22 05:28
with v7.2.16

Project summary

Geographical Site
Thessaloniki/Livadákion
Greece

Situation

Latitude	40.52 °N
Longitude	22.97 °E
Altitude	4 m
Time zone	UTC+2

Project settings
Albedo 0.20

Meteo data
Thessaloniki/Livadákion
Meteonorm 8.0 (1994-2006), Sat=14% - Synthetic

System summary

Grid-Connected System

Tracking system

PV Field Orientation
Orientation
Tracking two axis, frame E-W

Tracking algorithm
Astronomic calculation

Near Shadings
Linear shadings

System information

PV Array

Nb. of modules	216 units
Pnom total	114 kWp

Inverters

Nb. of units	1 unit
Pnom total	111 kWac
Pnom ratio	1.031

User's needs
Unlimited load (grid)

Results summary

Produced Energy	201.9 MWh/year	Specific production	1764 kWh/kWp/year	Perf. Ratio PR	75.73 %

Table of contents

PVsyst V7.2.16
VC2, Simulation date:
09/07/22 05:28
with v7.2.16

General parameters

Grid-Connected System

Tracking system

PV Field Orientation

Orientation
Tracking two axis, frame E-W

Tracking algorithm
Astronomic calculation

Trackers configuration

Nb. of trackers	108 units

Sizes

Tracker Spacing	10.00 m
Collector width	4.57 m
Ground Cov. Ratio (GCR)	45.7 %
Phi on frame min / max	0.0 / 40.0 °
Frame tilt min./ max	-/+ 60.0 °

Models used

Transposition	Perez
Diffuse	Perez, Meteonorm
Circumsolar	separate

Horizon

Average Height	7.4 °

Near Shadings
Linear shadings

User's needs
Unlimited load (grid)

PV Array Characteristics

PV module

Manufacturer	Generic
Model	JKM-530M-72HL4-V
(Custom parameters definition)	
Unit Nom. Power	530 Wp
Number of PV modules	216 units
Nominal (STC)	114 kWp
Modules	8 Strings x 27 In series
At operating cond. (50°C)	
Pmpp	104 kWp
U mpp	1002 V
I mpp	104 A

Inverter

Manufacturer	Generic
Model	SG111-HV
(Original PVsyst database)	
Unit Nom. Power	111 kWac
Number of inverters	1 unit
Total power	111 kWac
Operating voltage	780-1450 V
Pnom ratio (DC:AC)	1.03

Total PV power

Nominal (STC)	114 kWp
Total	216 modules
Module area	557 m²

Total inverter power

Total power	111 kWac
Number of inverters	1 unit
Pnom ratio	1.03

Array losses

Array Soiling Losses

Loss Fraction	1.5 %

Thermal Loss factor

Module temperature according to irradiance	
Uc (const)	29.0 W/m²K
Uv (wind)	0.0 W/m²K/m/s

DC wiring losses

Global array res.	106 mΩ
Loss Fraction	1.0 % at STC

Module Quality Loss

Loss Fraction	0.0 %

Module mismatch losses

Loss Fraction	0.6 % 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	0.962	0.892	0.816	0.681	0.440	0.000

PVsyst V7.2.16
VC2, Simulation date:
09/07/22 05:28
with v7.2.16

System losses

Auxiliaries loss
Proportionnal to Power 4.0 W/kW
0.0 kW from Power thresh.

AC wiring losses

Inv. output line up to MV transfo

Inverter voltage	540 Vac tri
Loss Fraction	0.21 % at STC

Inverter: SG111-HV

Wire section (1 Inv.)	Copper 1 x 3 x 240 mm²
Wires length	70 m

AC losses in transformers

MV transfo

Grid voltage	20 kV

Operating losses at STC

Nominal power at STC	113 kVA
Iron loss (24/24 Connexion)	0.11 kW
Loss Fraction	0.10 % at STC
Coils equivalent resistance	3 x 25.76 mΩ
Loss Fraction	1.00 % at STC

PVsyst V7.2.16
VC2, Simulation date:
09/07/22 05:28
with v7.2.16

Horizon definition

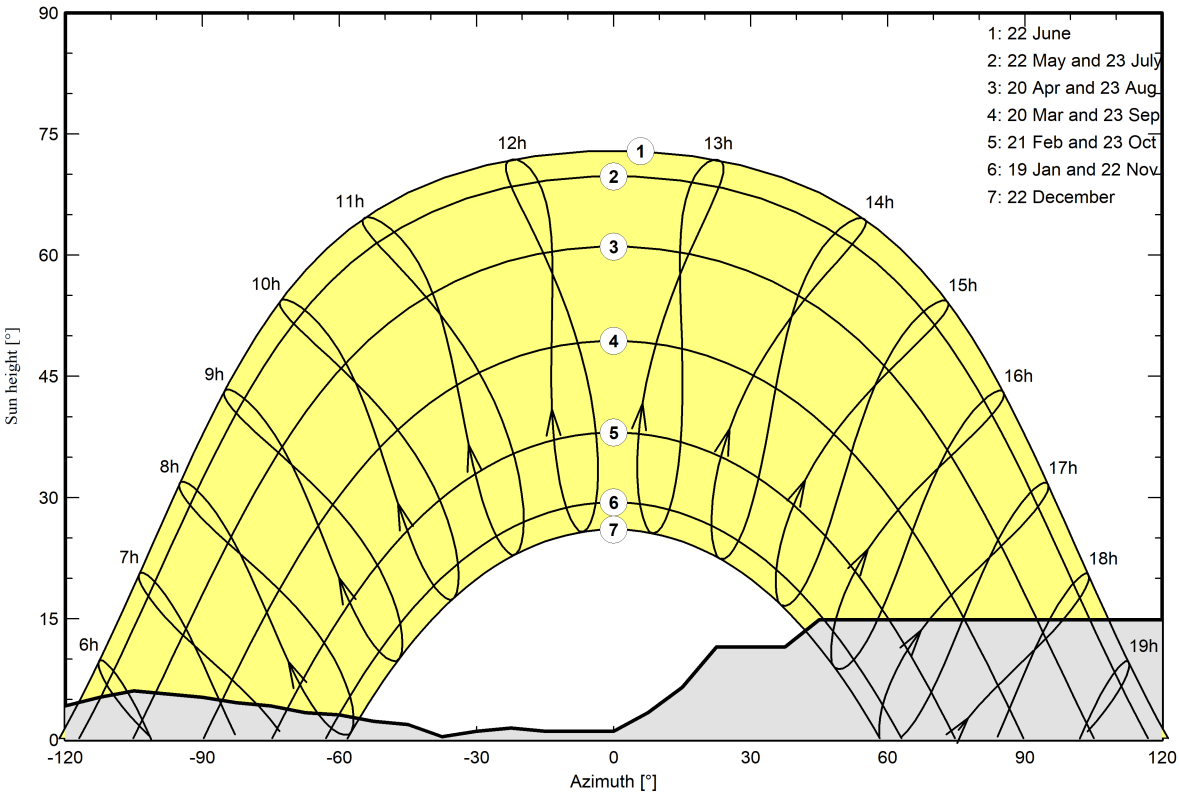
Horizon from PVGIS website API, Lat=39°37"58', Long=22°13"41', Alt=153m

Average Height	7.4 °	Albedo Factor	0.33
Diffuse Factor	0.80	Albedo Fraction	100 %

Horizon profile

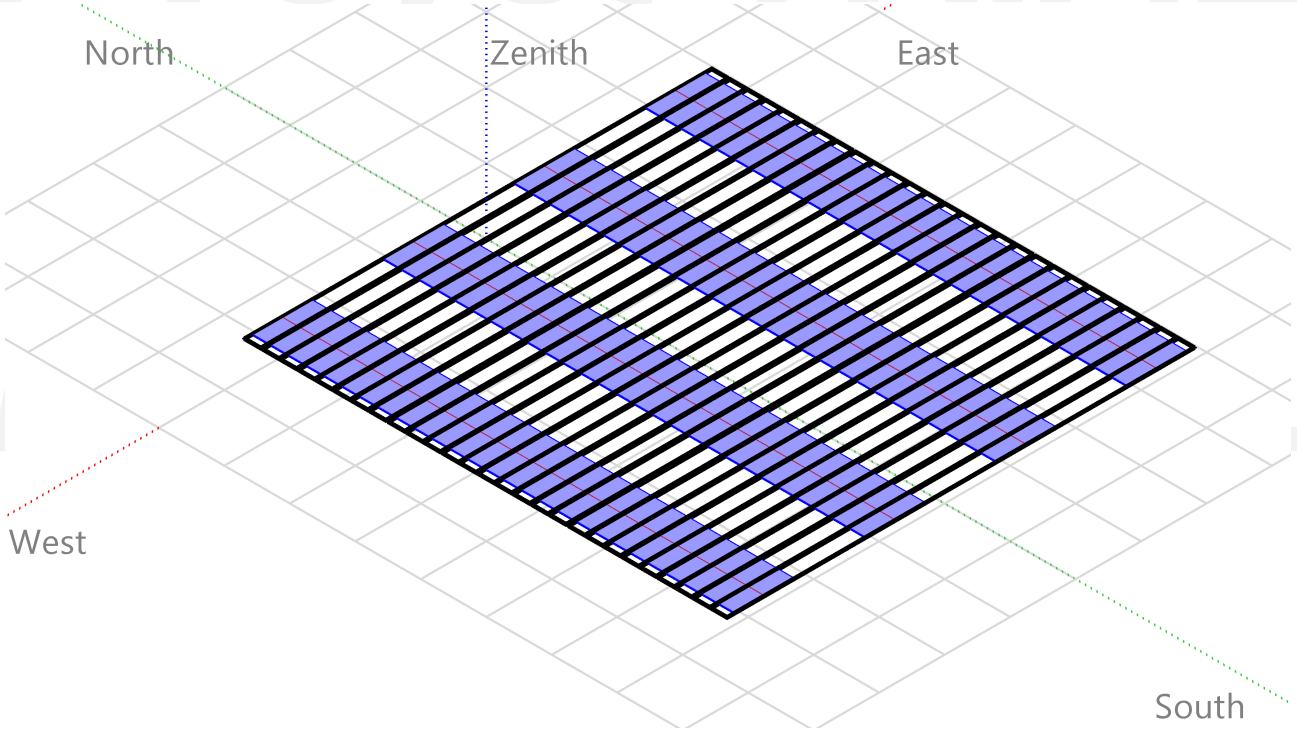
Azimuth [°]	-180	-173	-165	-158	-143	-135	-128	-120	-113	-105	-98	-90
Height [°]	1.9	3.4	4.6	5.7	7.3	6.5	4.6	4.2	5.3	6.1	5.7	5.3
Azimuth [°]	-83	-75	-68	-60	-53	-45	-38	-30	-23	-15	0	8
Height [°]	4.6	4.2	3.4	3.1	2.3	1.9	0.4	1.1	1.5	1.1	1.1	3.4
Azimuth [°]	15	23	38	45	135	143	150	158	165	173	180	
Height [°]	6.5	11.5	11.5	14.9	14.9	8.0	8.0	5.3	1.9	1.5	1.9	

Sun Paths (Height / Azimuth diagram)



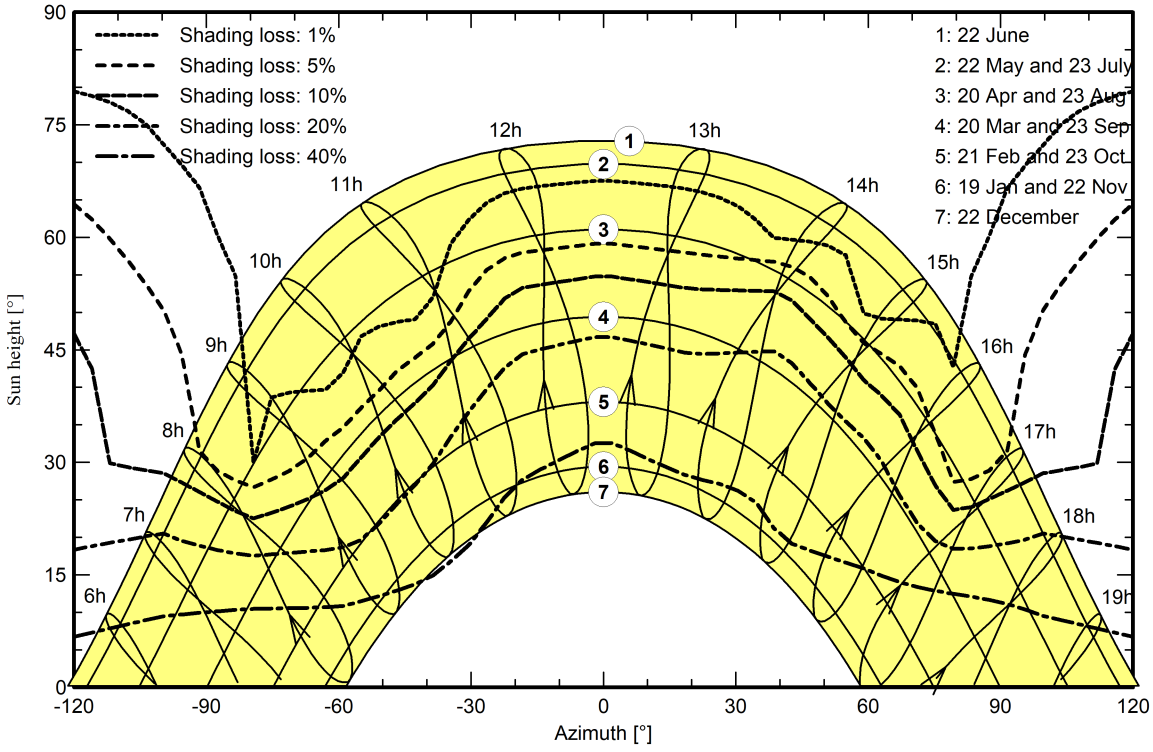
Near shadings parameter

Perspective of the PV-field and surrounding shading scene



Iso-shadings diagram

Orientation #1



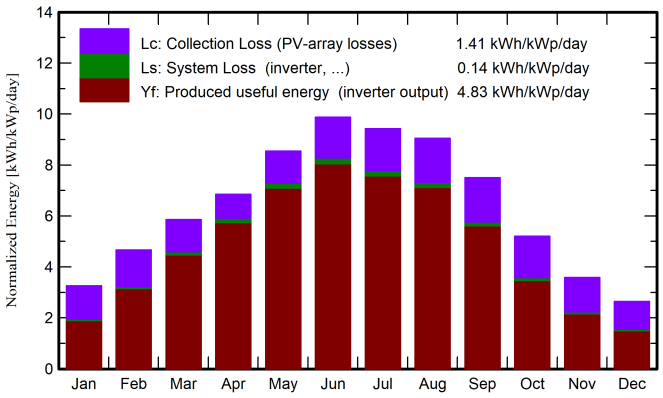
PVsyst V7.2.16
VC2, Simulation date:
09/07/22 05:28
with v7.2.16

Main results

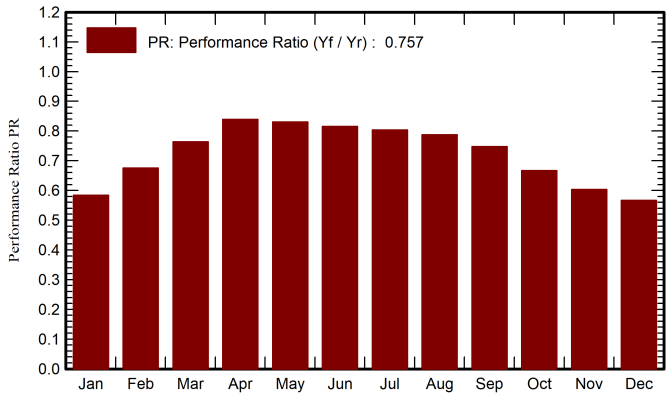
System Production

Produced Energy	201.9 MWh/year	Specific production	1764 kWh/kWp/year
		Performance Ratio PR	75.73 %

Normalized productions (per installed kWp)



Performance Ratio PR



Balances and main results

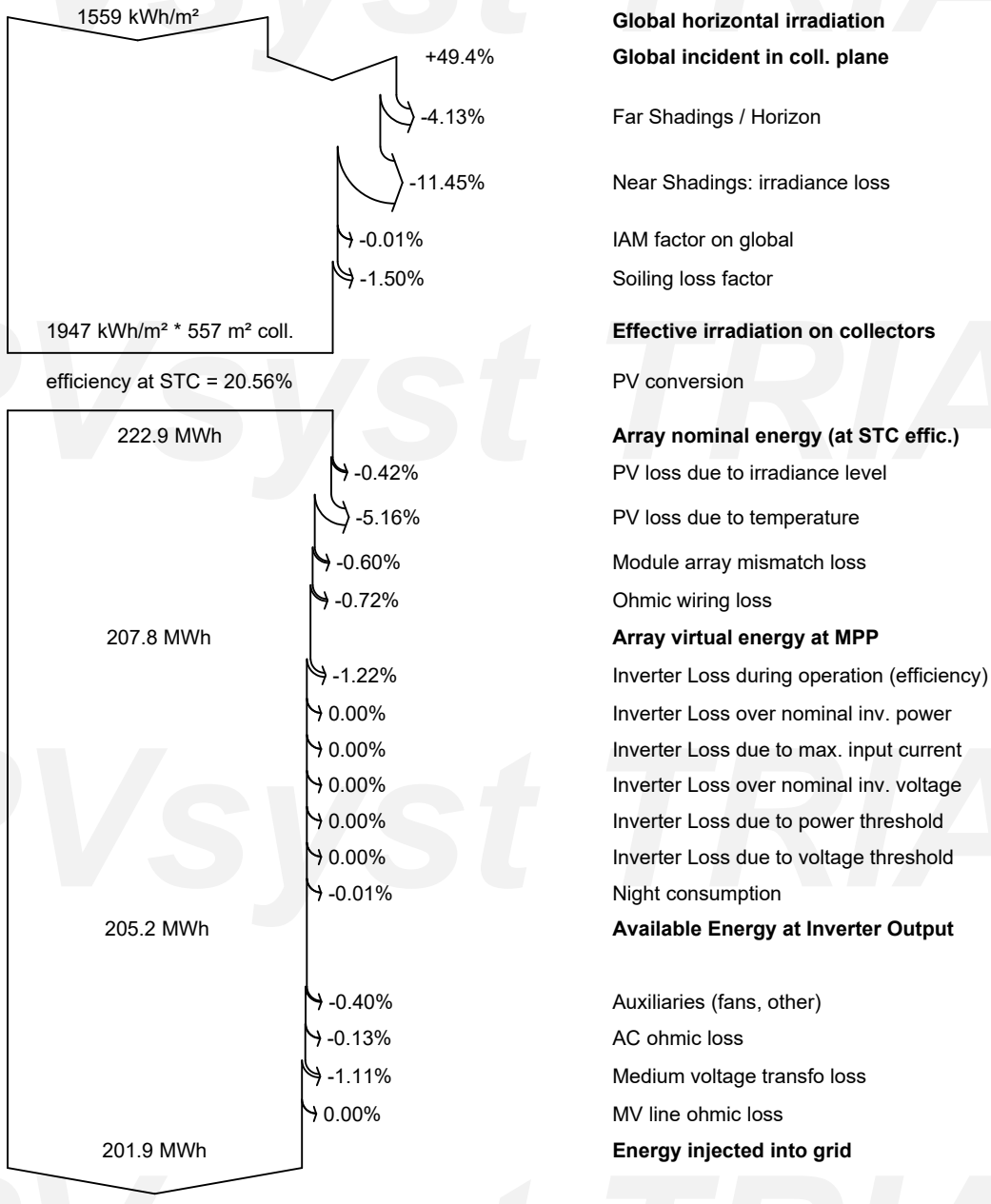
	GlobHor kWh/m²	DiffHor kWh/m²	T_Amb °C	GlobInc kWh/m²	GlobEff kWh/m²	EArray MWh	E_Grid MWh	PR ratio
January	52.6	29.21	4.95	101.0	61.1	7.00	6.75	0.584
February	76.4	39.36	6.71	130.7	91.8	10.42	10.11	0.676
March	118.0	57.36	9.91	181.5	146.5	16.33	15.87	0.764
April	150.3	77.02	13.73	205.5	185.8	20.32	19.75	0.840
May	195.0	84.41	19.52	264.8	243.7	25.88	25.18	0.831
June	218.4	75.24	24.54	296.2	274.6	28.44	27.66	0.816
July	214.7	82.15	27.83	292.4	269.9	27.65	26.90	0.804
August	194.0	76.29	27.71	280.5	253.0	25.99	25.30	0.788
September	144.2	53.93	21.67	225.2	187.4	19.83	19.28	0.748
October	94.1	43.87	16.53	161.5	115.9	12.71	12.33	0.667
November	57.9	29.79	11.46	107.6	68.8	7.70	7.44	0.604
December	43.4	24.96	6.66	81.8	48.6	5.53	5.31	0.567
Year	1559.1	673.58	15.99	2328.7	1947.1	207.80	201.89	0.757

Legends

GlobHor	Global horizontal irradiation	EArray	Effective energy at the output of the array
DiffHor	Horizontal diffuse irradiation	E_Grid	Energy injected into grid
T_Amb	Ambient Temperature	PR	Performance Ratio
GlobInc	Global incident in coll. plane		
GlobEff	Effective Global, corr. for IAM and shadings		

PVsyst V7.2.16
VC2, Simulation date:
09/07/22 05:28
with v7.2.16

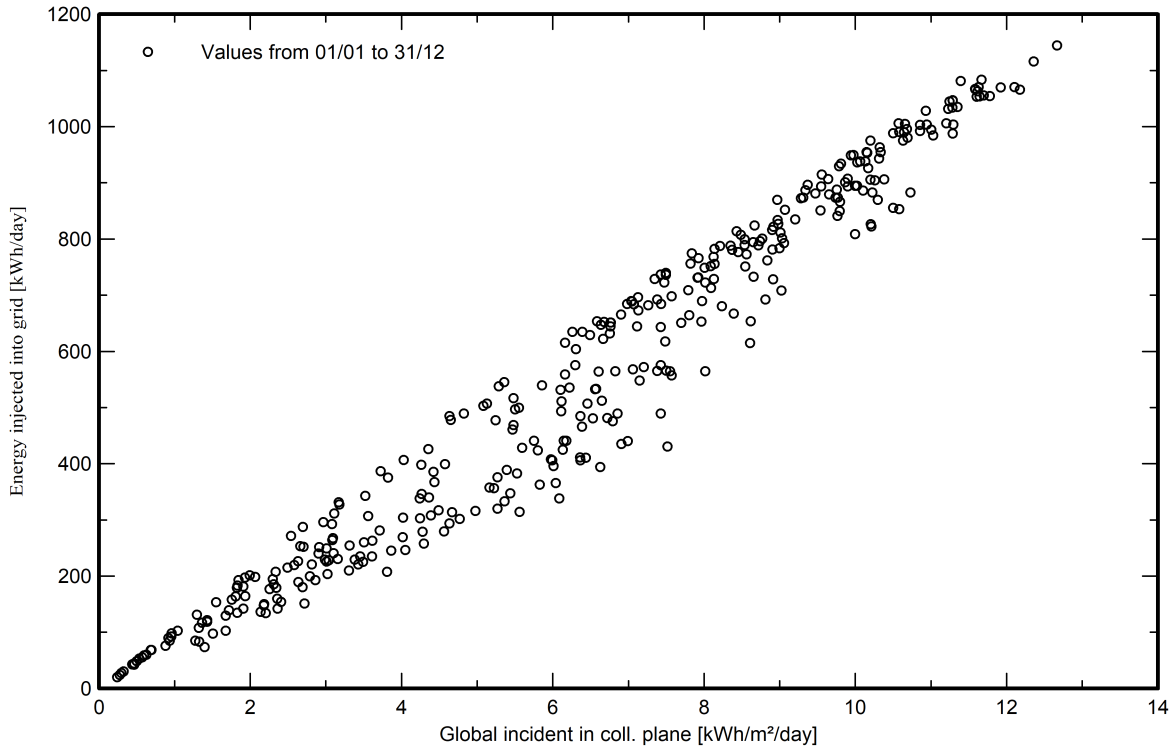
Loss diagram



PVsyst V7.2.16
VC2, Simulation date:
09/07/22 05:28
with v7.2.16

Special graphs

Daily Input/Output diagram



System Output Power Distribution