



COMUNE DI SPINAZZOLA

PROVINCIA DI BARLETTA ANDRIA TRANI

REGIONE PUGLIA

COMUNE DI GENZANO DI LUCANIA

PROVINCIA DI POTENZA

REGIONE BASILICATA

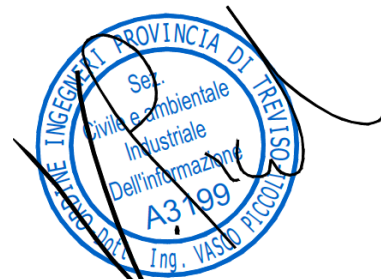
IMPIANTO SOLARE FOTOVOLTAICO "SAVINETTA" CONNESSO ALLA RTN DELLA POTENZA DI PICCO P=20'659.86 kWp E POTENZA IN IMMISSIONE PARI A 20'000 kW, DELLE RELATIVE OPERE DI CONNESSIONE ALLA RTN E PIANO AGRONOMOICO PER L'UTILIZZO A SCOPI AGRICOLI DELL'AREA

Proponente

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Codice Autorizzazione Unica A3EBD54

Titolo elaborato

IMPIANTO FOTOVOLTAICO "SAVINETTA" STIMA PRODUCIBILITÀ ENERGETICA IMPIANTO FV

Elaborato N.

15DS

Data emissione

06/08/21

Nome file

PVSyst REPORT

N. Progetto

SOL027

Pagina

COVER

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06/08/21

PRIMA EMISSIONE

REV.

DATA

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PVsyst - Simulation report

Grid-Connected System

Project: SOL 027 – Spinazzola

Variant: pitch 5m tracker55_rev02 (def)

Trackers single array, with backtracking

System power: 20.66 MWp

Spinazzola - Italy

Author

New Engineering s.r.l. (Italy)



PVsyst V7.2.3

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Project summary

Geographical Site		Situation		Project settings	
Spinazzola		Latitude	40.93 °N	Albedo	0.20
Italy		Longitude	16.12 °E		
		Altitude	433 m		
		Time zone	UTC+1		
Meteo data					
Spinazzola					
Meteonorm 7.2 (1986-2005), Sat=100% - Synthetic					

System summary

Grid-Connected System		Trackers single array, with backtracking			
PV Field Orientation		Near Shadings		User's needs	
Tracking plane, horizontal N-S axis		According to strings		Unlimited load (grid)	
Axis azimuth	0 °	Electrical effect	80 %		
System information					
PV Array					
Nb. of modules	37908 units	Inverters		7 units	
Pnom total	20.66 MWp	Nb. of units		17.85 MWac	
		Pnom total		1.157	
		Pnom ratio			

Results summary

Produced Energy	40381 MWh/year	Specific production	1955 kWh/kWp/year	Perf. Ratio PR	91.43 %
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General parameters

Grid-Connected System		Trackers single array, with backtracking	
PV Field Orientation		Backtracking strategy	
Orientation		Nb. of trackers	60 units
Tracking plane, horizontal N-S axis		Single array	
Axis azimuth	0 °	Sizes	
		Tracker Spacing	5.00 m
		Collector width	2.18 m
		Ground Cov. Ratio (GCR)	43.6 %
		Left inactive band	0.02 m
		Right inactive band	0.02 m
		Phi min / max.	-/+ 55.0 °
		Backtracking limit angle	
		Phi limits	+/- 63.4 °
Horizon		Near Shadings	
Free Horizon		According to strings	
		Electrical effect	80 %
Bifacial system		User's needs	
Model	2D Calculation	Unlimited load (grid)	
	unlimited trackers		
Bifacial model geometry		Bifacial model definitions	
Tracker Spacing	5.00 m	Ground albedo	0.30
Tracker width	2.22 m	Bifaciality factor	70 %
GCR	44.4 %	Rear shading factor	5.0 %
Axis height above ground	2.10 m	Rear mismatch loss	10.0 %
		Module transparency	0.0 %

PV Array Characteristics

PV module		Inverter	
Manufacturer	Jinkosolar	Manufacturer	Jema
Model	JKM545M-72HL4-TV	Model	IFX6 -2550 TL.620 (Rev2)
(Custom parameters definition)		(Custom parameters definition)	
Unit Nom. Power	545 Wp	Unit Nom. Power	2550 kWac
Number of PV modules	37908 units	Number of inverters	7 unit
Nominal (STC)	20.66 MWp	Total power	17850 kWac
Modules	1458 Strings x 26 In series	Operating voltage	890-1250 V
At operating cond. (50°C)		Max. power (=>25°C)	2850 kWac
Pmpp	18.86 MWp	Pnom ratio (DC:AC)	1.16
U mpp	971 V		
I mpp	19422 A		
Total PV power		Total inverter power	
Nominal (STC)	20660 kWp	Total power	17850 kWac
Total	37908 modules	Nb. of inverters	7 units
Module area	97754 m²	Pnom ratio	1.16
Cell area	90124 m²		



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Array losses

Array Soiling Losses

Loss Fraction 2.0 %

Thermal Loss factor

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

DC wiring losses

Global array res. 0.77 mΩ
 Loss Fraction 1.4 % at STC

LID - Light Induced Degradation

Loss Fraction 1.3 %

Module Quality Loss

Loss Fraction -0.3 %

Module mismatch losses

Loss Fraction 0.5 % at MPP

Strings Mismatch loss

Loss Fraction 0.1 %

IAM loss factor

Incidence effect (IAM): User defined profile

0°	30°	50°	60°	70°	75°	80°	85°	90°
1.000	1.000	1.000	1.000	0.989	0.971	0.924	0.729	0.000

System losses

Auxiliaries loss

Proportionnal to Power 5.0 W/kW
 0.0 kW from Power thresh.

AC wiring losses

Inv. output line up to MV transfo

Inverter voltage 620 Vac tri
 Loss Fraction 0.07 % at STC

Inverter: IFX6 -2550 TL.620 (Rev2)

Wire section (7 Inv.) Copper 7 x 3 x 2000 mm²
 Average wires length 10 m

MV line up to Injection

MV Voltage 30 kV
 Average each inverter
 Wires Copper 3 x 300 mm²
 Length 8900 m
 Loss Fraction 0.63 % at STC

AC losses in transformers

MV transfo

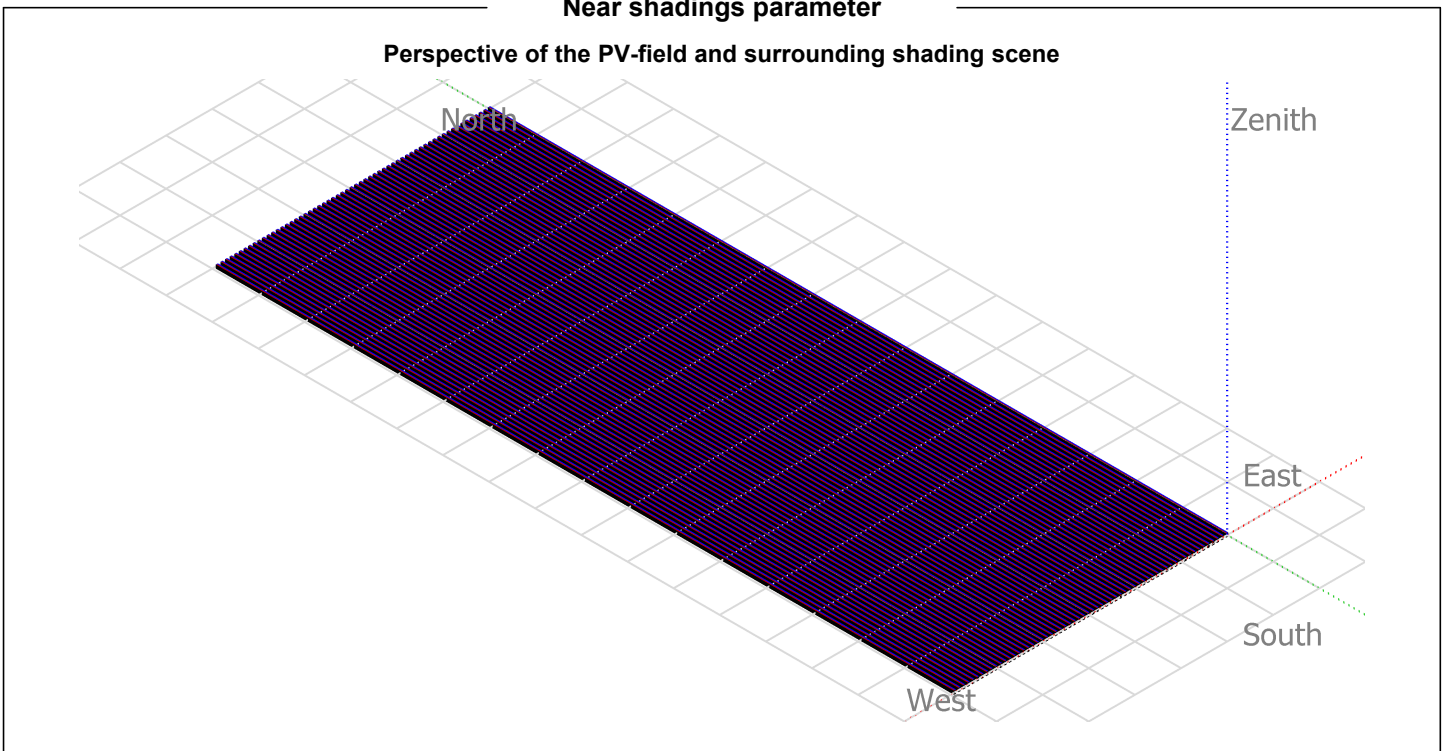
Grid voltage 30 kV

Operating losses at STC

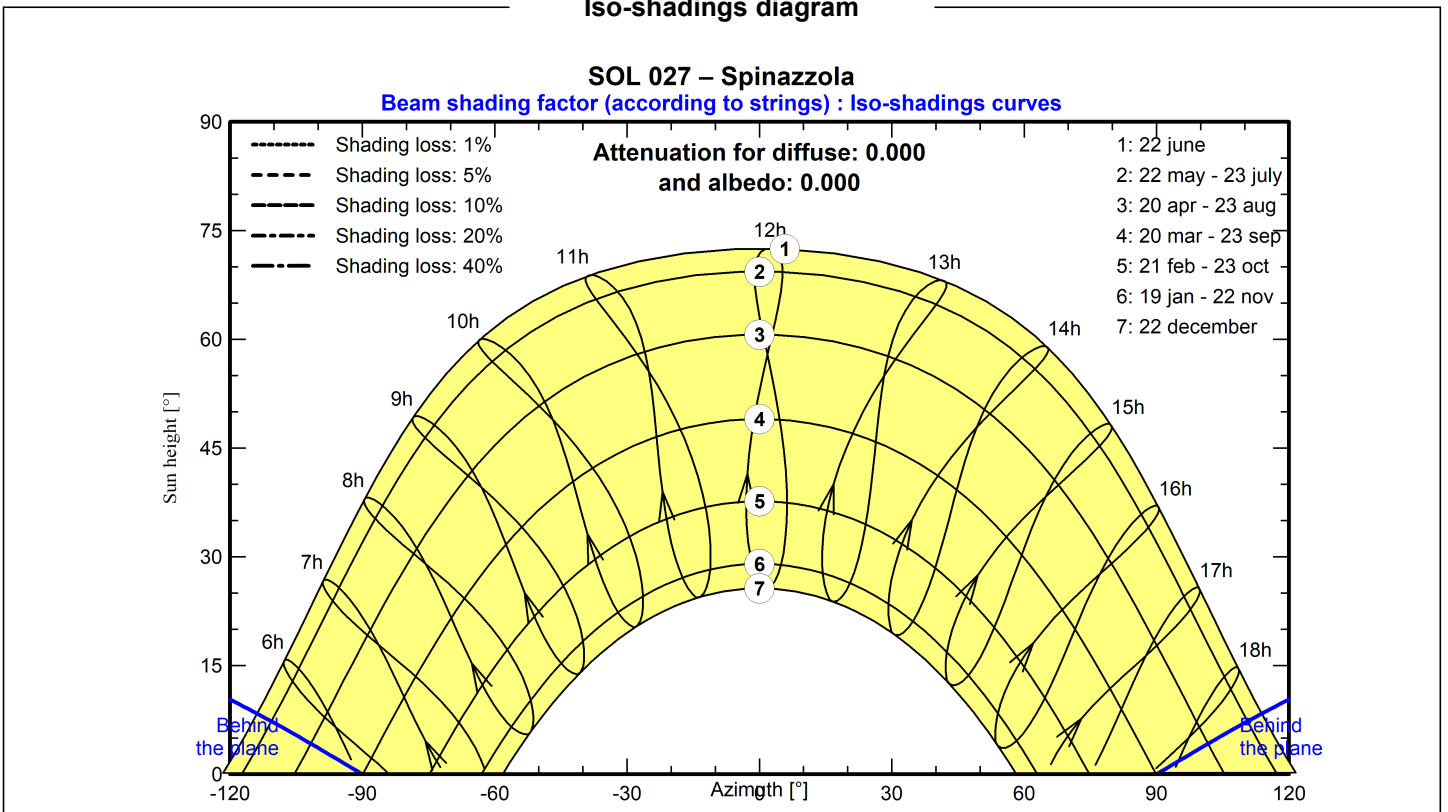
Nominal power at STC 20386 kVA
 Iron loss (24/24 Connexion) 15.29 kW/Inv.
 Loss Fraction 0.15 % at STC
 Coils equivalent resistance 3 x 0.30 mΩ/inv.
 Loss Fraction 0.80 % at STC



Near shadings parameter



Iso-shadings diagram





Main results

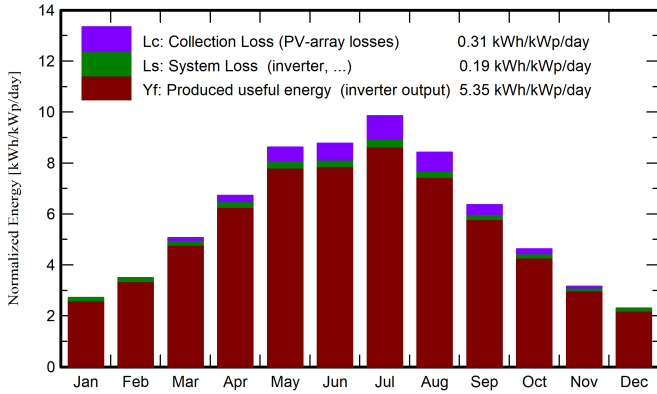
System Production

Produced Energy 40381 MWh/year

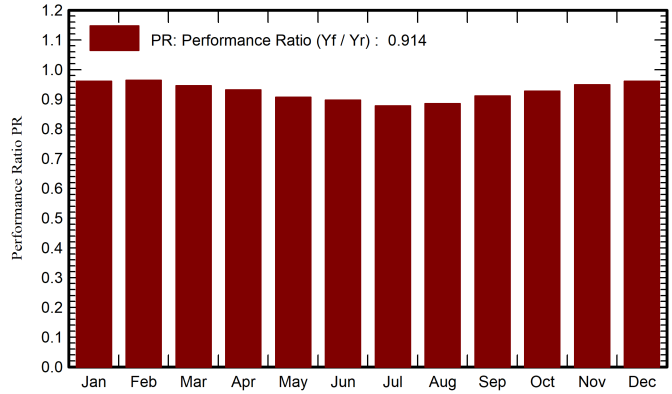
Specific production
 Performance Ratio PR

1955 kWh/kWp/year
 91.43 %

Normalized productions (per installed kWp)



Performance Ratio PR



Balances and main results

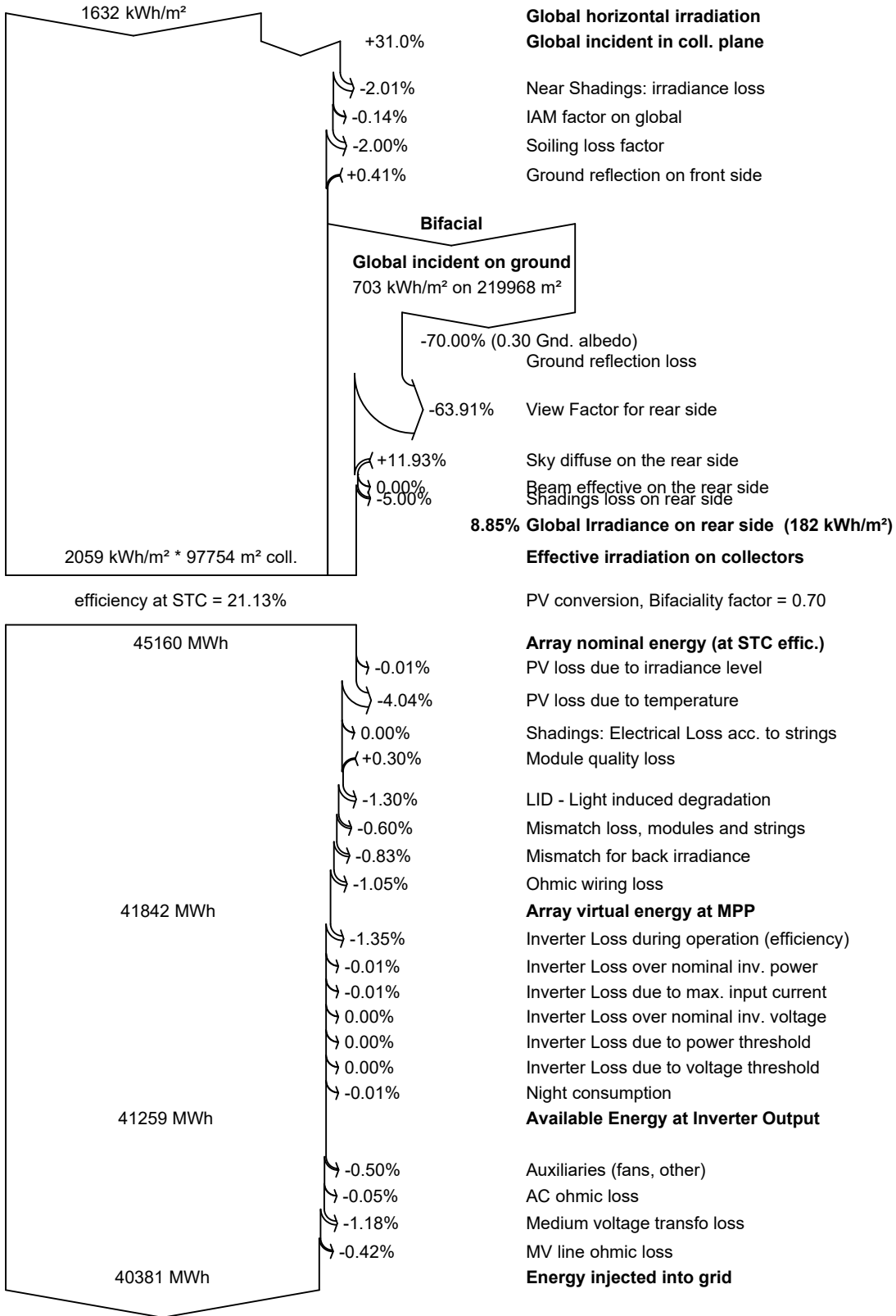
	GlobHor kWh/m ²	DiffHor kWh/m ²	T_Amb °C	GlobInc kWh/m ²	GlobEff kWh/m ²	EArray MWh	E_Grid MWh	PR ratio
January	61.2	22.26	6.29	84.0	80.7	1739	1668	0.961
February	74.8	32.68	6.32	97.7	93.7	2022	1945	0.964
March	121.6	48.18	9.22	157.3	151.1	3186	3072	0.946
April	157.1	64.90	12.17	201.9	194.1	4025	3888	0.932
May	205.5	74.75	17.53	267.3	257.7	5181	5009	0.907
June	207.4	80.65	21.71	263.0	253.4	5040	4876	0.897
July	230.9	64.16	24.86	305.4	295.1	5727	5540	0.878
August	198.4	65.74	24.43	261.1	251.9	4938	4775	0.885
September	143.6	51.83	19.05	190.9	183.9	3719	3593	0.911
October	107.4	39.23	15.76	143.4	137.9	2848	2748	0.928
November	70.1	27.09	11.04	94.7	90.9	1930	1856	0.949
December	53.7	24.39	7.72	71.2	68.1	1476	1413	0.960
Year	1631.7	595.86	14.73	2137.9	2058.6	41831	40381	0.914

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



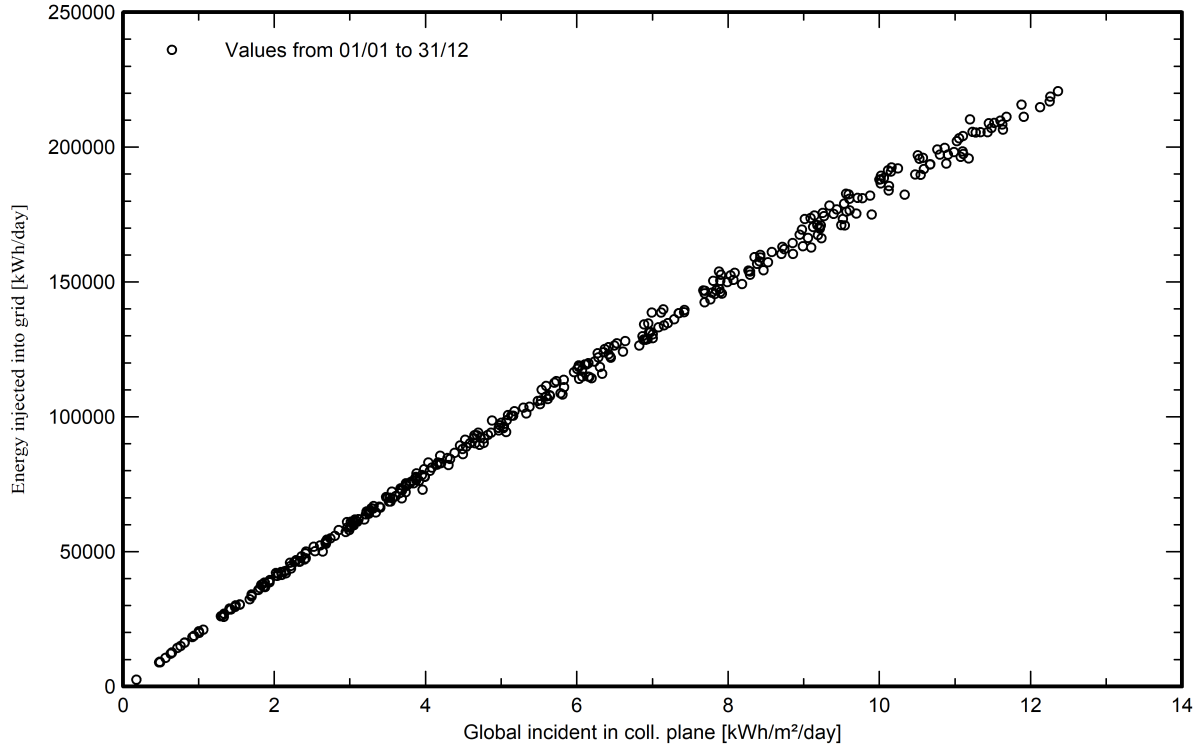
Loss diagram





Special graphs

Daily Input/Output diagram



System Output Power Distribution

