



**REGIONE
PUGLIA**



Provincia di Lecce



Comune di Nardò

Committente:

SUNCO SUN YELLOW SRL

Via Melchiorre Gioia, 8 - 20124 Milano - Italy
pec: suncosunyellowsr@legalmail.it

**SUNCO.
CAPITAL**

PROGETTO DEFINITIVO

Denominazione progetto:

**REALIZZAZIONE IMPIANTO AGRIVOLTAICO
"MASSERIA SCIANNE"**

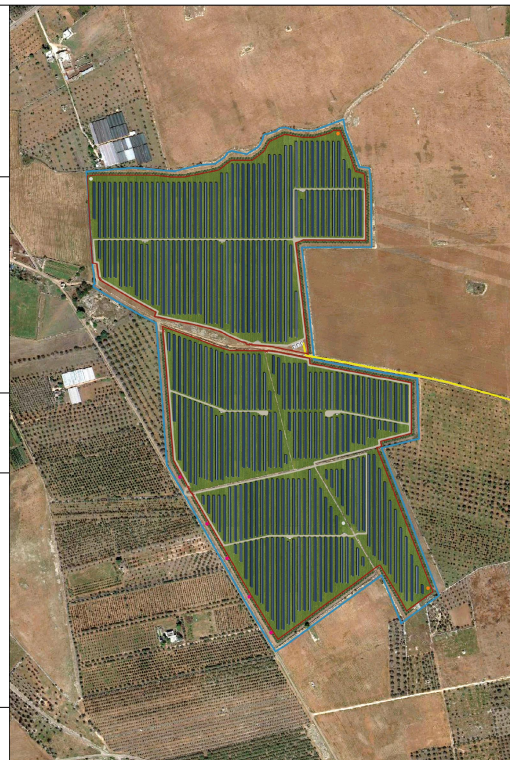
Potenza nominale complessiva = 30.722,4 kWp

Sito in:

COMUNE DI NARDO' (LE)

Titolo elaborato:

Stima della producibilità



Elaborato T-SDP0

Scala -

Responsabile Coordinamento progetto : dott.ssa agr. Eliana Santoro

TIMBRI E FIRME:

Progettisti :



Collaboratori :

Flyren Development S.r.l.
Lungo Po Antonelli, 21 - 10153 Torino (TO)
tel: 011/ 8123575 - fax: 011/ 8127528
email: info@flyren.eu
web: www.flyren.eu
C.F. / P. IVA n. 12062400010

REV.:	REDAZIONE:	CONTROLLO:	APPROVAZIONE :	DATA:
00	Matteo Pradotto	ing. Massimiliano Marchica	ing. Massimiliano Marchica	01/02/2024
01				
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FIRMA/TIMBRO
COMMITTENTE:

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PVsyst - Simulation report

Grid-Connected System

Project: Masseria Scianne

Variant: Agrivoltaico

Tracking system with backtracking

System power: 30.72 MWp

Corsari - Italy

Author

flyRen Development srl (Italy)



Project: Masseria Scianne

Variant: Agrivoltaico

PVsyst V7.3.1

VCO, Simulation date:
06/12/23 10:31
with v7.3.1

flyRen Development srl (Italy)

Project summary

Geographical Site	Situation	Project settings
Corsari	Latitude 40.23 °N	Albedo 0.20
Italy	Longitude 17.98 °E	
	Altitude 45 m	
	Time zone UTC+1	
Meteo data		
Corsari		
Meteonorm 8.1, Sat=100% - Synthetic		

System summary

Grid-Connected System	Tracking system with backtracking	
Simulation for year no 1		
PV Field Orientation	Tracking algorithm	Near Shadings
Orientation	Astronomic calculation	Linear shadings
Tracking plane, horizontal N-S axis	Backtracking activated	
Axis azimuth 0 °		
System information		
PV Array	Inverters	
Nb. of modules 45180 units	Nb. of units 78 units	
Pnom total 30.72 MWp	Pnom total 25.74 MWac	
	Pnom ratio 1.194	
User's needs		
Unlimited load (grid)		

Results summary

Produced Energy	54158640 kWh/year	Specific production	1763 kWh/kWp/year	Perf. Ratio PR	85.75 %
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Table of contents

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



General parameters

Grid-Connected System

PV Field Orientation

Orientation

Tracking plane, horizontal N-S axis

Axis azimuth 0 °

Models used

Transposition Perez

Diffuse Perez, Meteonorm

Circumsolar separate

Horizon

Free Horizon

Bifacial system

Model 2D Calculation
unlimited trackers

Bifacial model geometry

Tracker Spacing 12.00 m

Tracker width 4.79 m

GCR 39.9 %

Axis height above ground 2.10 m

Tracking system with backtracking

Tracking algorithm

Astronomic calculation

Backtracking activated

Near Shadings

Linear shadings

Backtracking array

Nb. of trackers 1506 units

Sizes

Tracker Spacing 12.0 m

Collector width 4.79 m

Ground Cov. Ratio (GCR) 39.9 %

Phi min / max. +/- 60.0 °

Backtracking strategy

Phi limits for BT +/- 66.4 °

Backtracking pitch 12.0 m

Backtracking width 4.79 m

User's needs

Unlimited load (grid)

Bifacial model definitions

Ground albedo 0.15

Bifaciality factor 80 %

Rear shading factor 5.0 %

Rear mismatch loss 5.0 %

Shed transparent fraction 0.0 %

PV Array Characteristics

PV module

Manufacturer CSI Solar Co., Ltd.

Model CS7N-680TB-AG 1500V

(Custom parameters definition)

Unit Nom. Power 680 Wp

Number of PV modules 45180 units

Nominal (STC) 30.72 MWp

Modules 1506 Strings x 30 In series

At operating cond. (50°C)

Pmpp 28.42 MWp

U mpp 1079 V

I mpp 26338 A

Total PV power

Nominal (STC) 30722 kWp

Total 45180 modules

Module area 140345 m²

Inverter

Manufacturer Huawei Technologies

Model SUN2000-330KTL-H1

(Custom parameters definition)

Unit Nom. Power 330 kWac

Number of inverters 78 units

Total power 25740 kWac

Operating voltage 500-1500 V

Max. power (=>30°C) 330 kWac

Pnom ratio (DC:AC) 1.19

Power sharing within this inverter

Total inverter power

Total power 25740 kWac

Number of inverters 78 units

Pnom ratio 1.19



Array losses

Array Soiling Losses

Loss Fraction 3.5 %

Serie Diode Loss

Voltage drop 0.7 V

Loss Fraction 0.1 % at STC

Module mismatch losses

Loss Fraction 0.9 % at MPP

Thermal Loss factor

Module temperature according to irradiance

Uc (const) 29.0 W/m²KUv (wind) 0.0 W/m²K/m/s

LID - Light Induced Degradation

Loss Fraction 1.5 %

Strings Mismatch loss

Loss Fraction 0.1 %

DC wiring losses

Global array res. 0.31 mΩ

Loss Fraction 0.7 % at STC

Module Quality Loss

Loss Fraction -0.4 %

Module average degradation

Year no 1

Loss factor 0.4 %/year

Mismatch due to degradation

Imp RMS dispersion 0.4 %/year

Vmp RMS dispersion 0.4 %/year

IAM loss factor

Incidence effect (IAM): User defined profile

20°	40°	60°	65°	70°	75°	80°	85°	90°
1.000	1.000	1.000	0.990	0.960	0.920	0.840	0.720	0.000

System losses

Unavailability of the system

Time fraction 1.0 %
3.7 days,
3 periods

Auxiliaries loss

Proportionnal to Power 3.0 W/kW
0.0 kW from Power thresh.

AC wiring losses

Inv. output line up to MV transfo

Inverter voltage 800 Vac tri

Loss Fraction 0.89 % at PNom

Inverter: SUN2000-330KTL-H1

Wire section (78 Inv.) Copper 78 x 3 x 240 mm²

Average wires length 220 m

MV line up to HV Transfo

MV Voltage 20 kV

Average each inverter

Wires Alu 3 x 240 mm²

Length 600 m

Loss Fraction 0.13 % at PNom

HV line up to Injection

HV line voltage 36 kV

Wires Copper 3 x 240 mm²

Length 4000 m

Loss Fraction 0.62 % at PNom

AC losses in transformers

MV transfo

Medium voltage 20 kV

One transfo parameters

Nominal power at PNom 6.44 MVA

Iron Loss (night disconnect) 8.30 kVA

Iron loss fraction 0.13 % at PNom

Copper loss 49.92 kVA

Copper loss fraction 0.78 % at PNom

Coils equivalent resistance 3 x 0.77 mΩ

Operating losses at PNom (full system)

Nb. identical MV transfos 4

Nominal power at PNom 25.74 MVA

Iron loss (night disconnect) 33.18 kVA

Copper loss 199.67 kVA



AC losses in transformers

HV transfo

Grid voltage 36 kV

Transformer from Datasheets

Nominal power 27000 kVA

Iron Loss (night disconnect) 22.50 kVA

Iron loss fraction 0.08 % of PNom

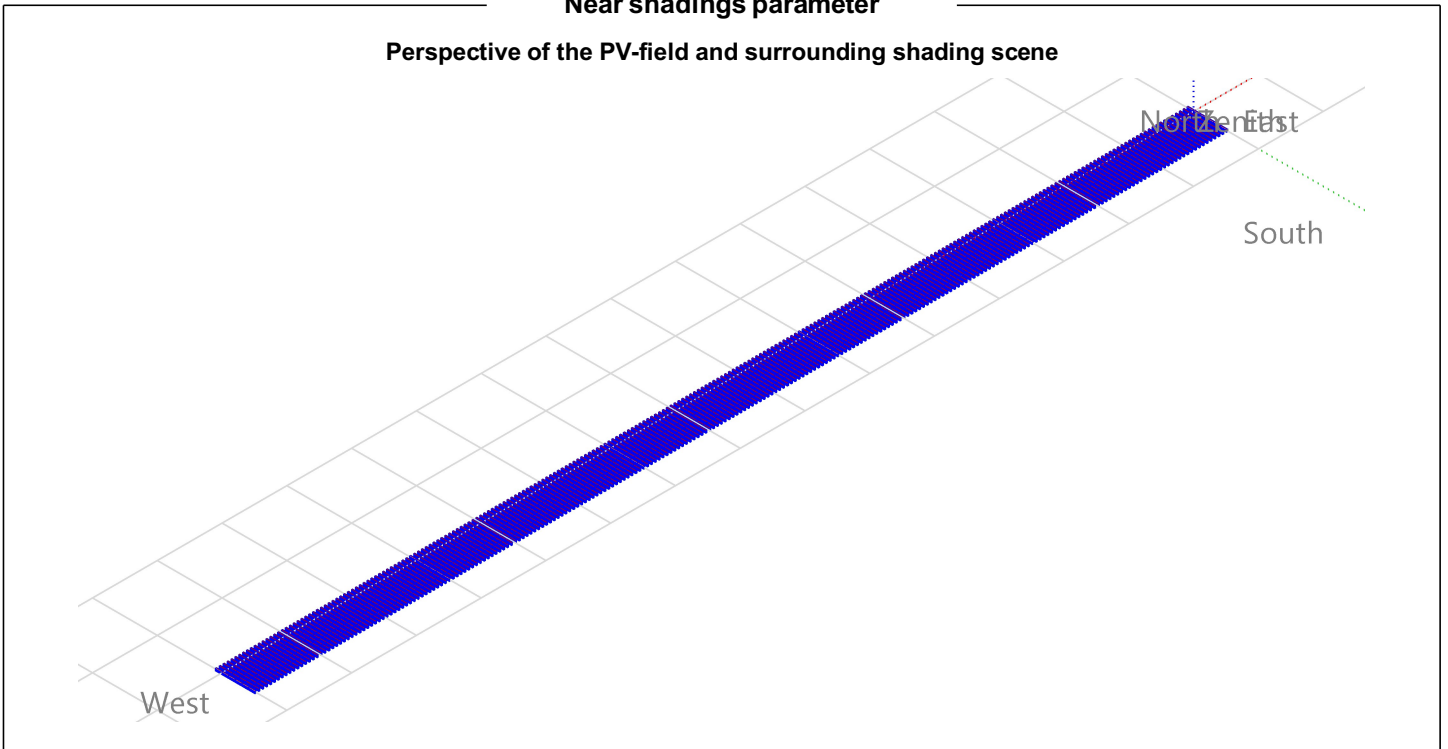
Copper loss 272.20 kVA

Copper loss fraction 1.01 % at PNom

Coils equivalent resistance 3 x 149.36 mΩ

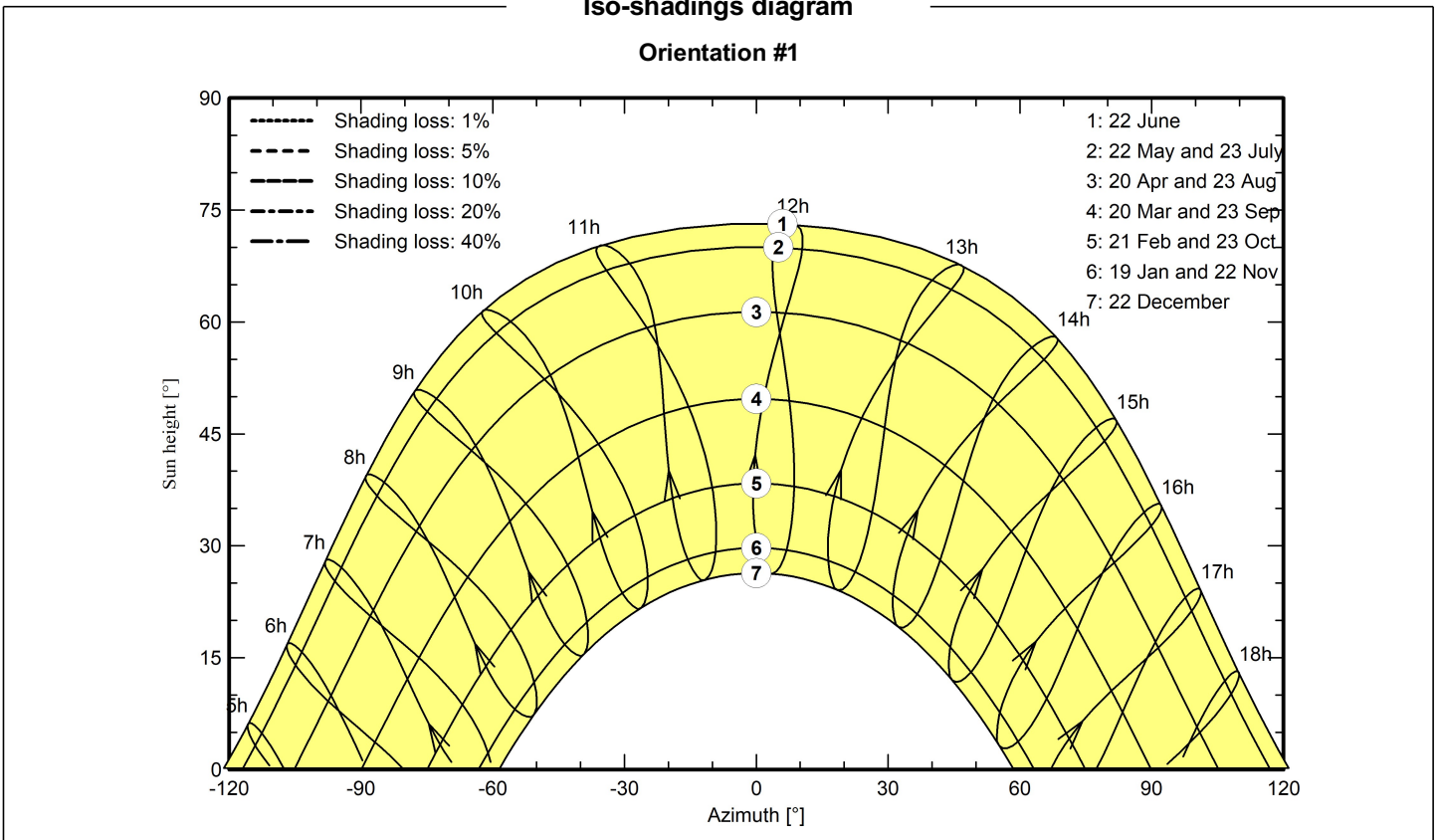


Near shadings parameter



Iso-shadings diagram

Orientation #1





Main results

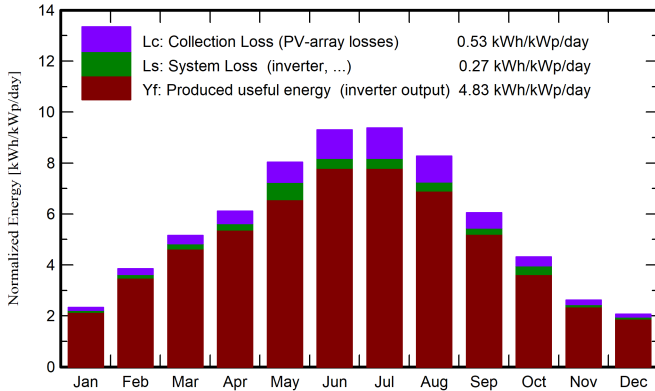
System Production

Produced Energy 54158640 kWh/year

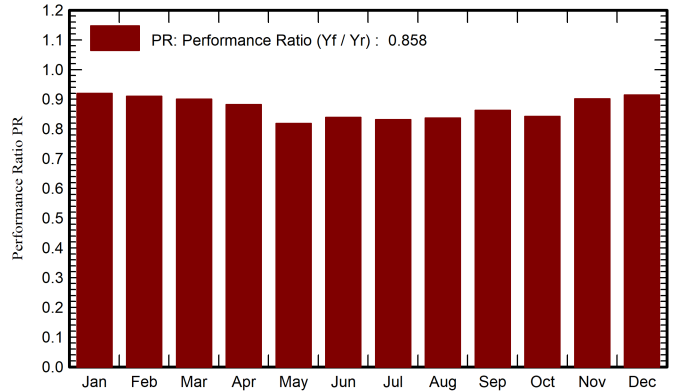
Specific production
Performance Ratio PR

1763 kWh/kWp/year
85.75 %

Normalized productions (per installed kWp)



Performance Ratio PR



Balances and main results

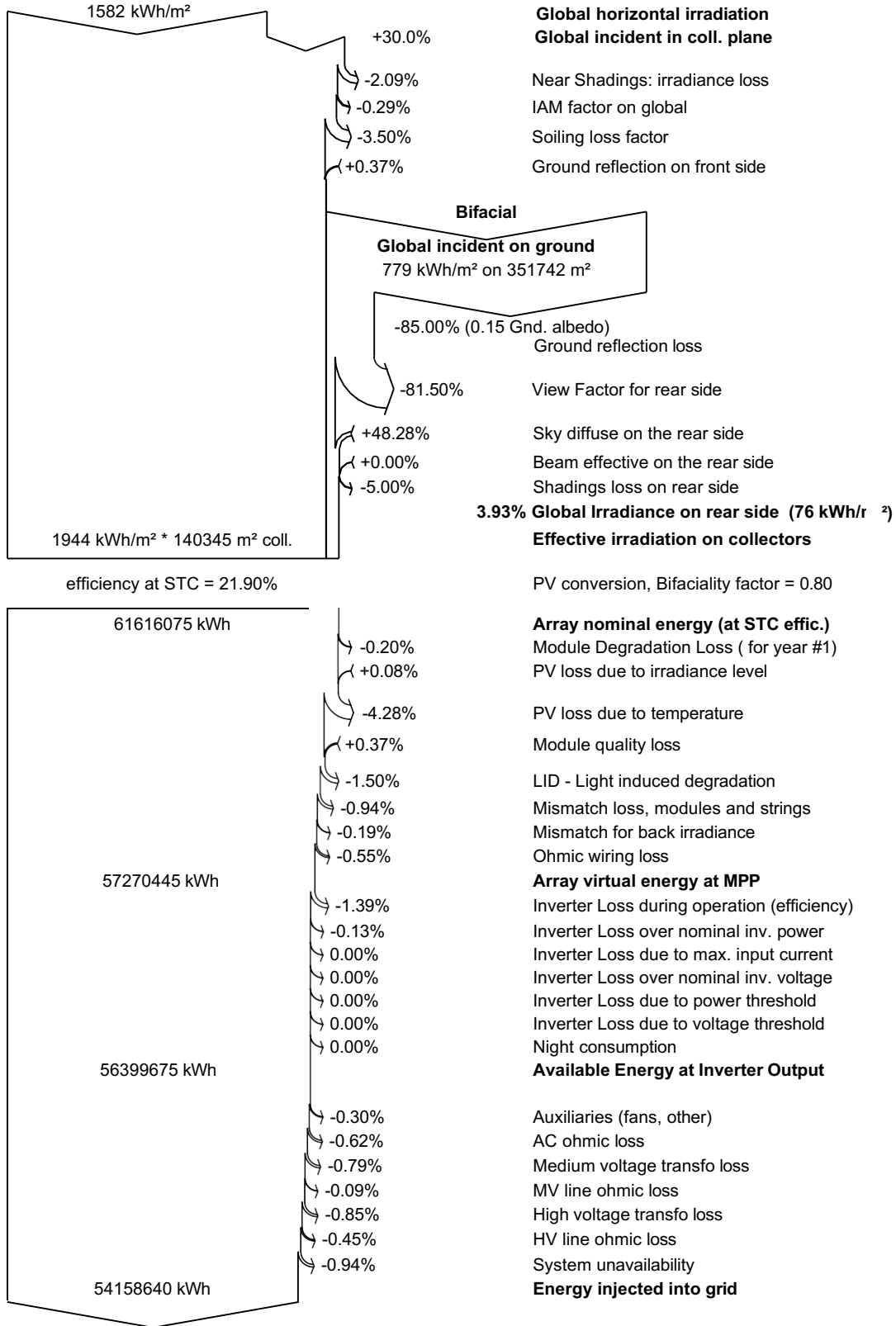
	GlobHor kWh/m ²	DiffHor kWh/m ²	T_Amb °C	GlobInc kWh/m ²	GlobEff kWh/m ²	EArray kWh	E_Grid kWh	PR ratio
January	56.4	28.27	9.09	72.4	68.0	2126438	2046842	0.920
February	79.9	33.37	9.77	107.6	101.5	3131479	3008662	0.910
March	124.2	60.22	12.54	159.9	150.9	4617008	4424769	0.901
April	146.1	71.48	15.63	183.2	172.8	5197413	4965984	0.882
May	195.4	86.75	20.67	248.9	235.5	6905208	6258102	0.818
June	214.5	78.01	25.52	279.0	264.7	7550709	7189484	0.839
July	220.9	77.17	28.55	290.8	276.0	7805587	7429564	0.832
August	193.5	72.40	28.35	256.2	243.0	6917212	6590343	0.837
September	139.7	58.82	22.98	181.3	171.4	5025742	4803996	0.862
October	103.4	46.82	18.94	133.7	126.2	3787964	3461706	0.843
November	59.7	31.04	14.56	78.6	73.7	2263216	2177158	0.902
December	48.1	25.36	10.56	64.1	60.0	1870029	1802031	0.915
Year	1581.9	669.71	18.15	2055.7	1943.7	57198005	54158640	0.858

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



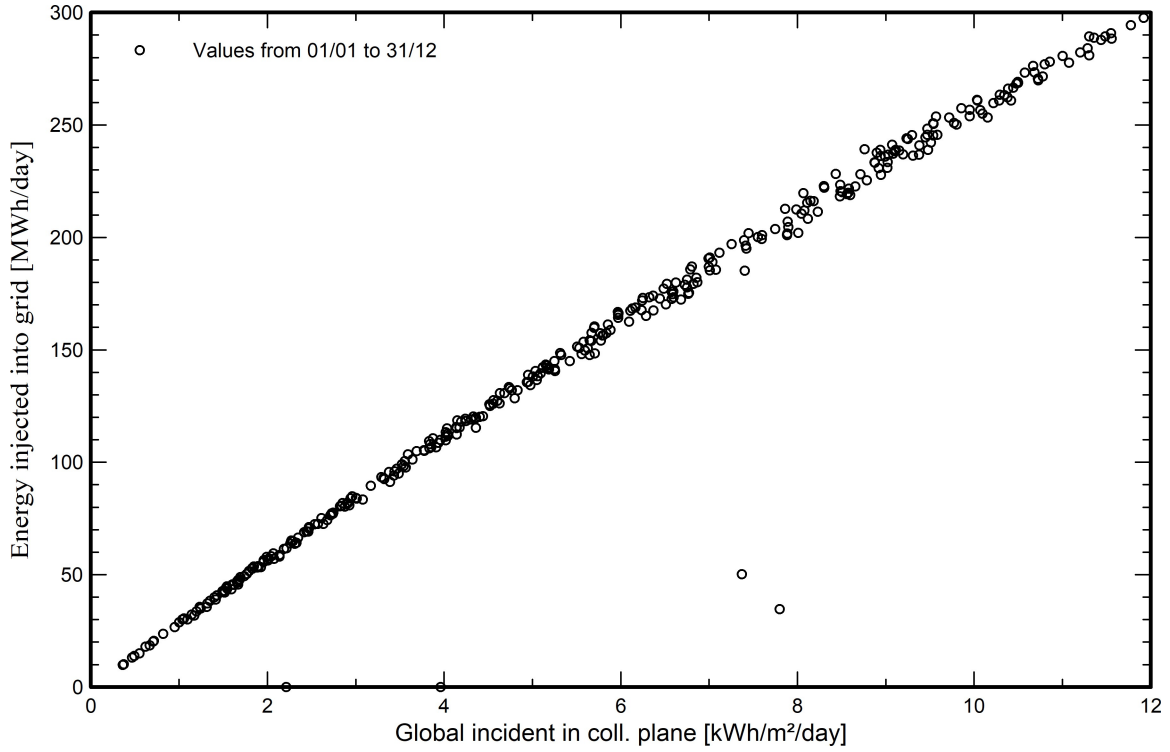
Loss diagram



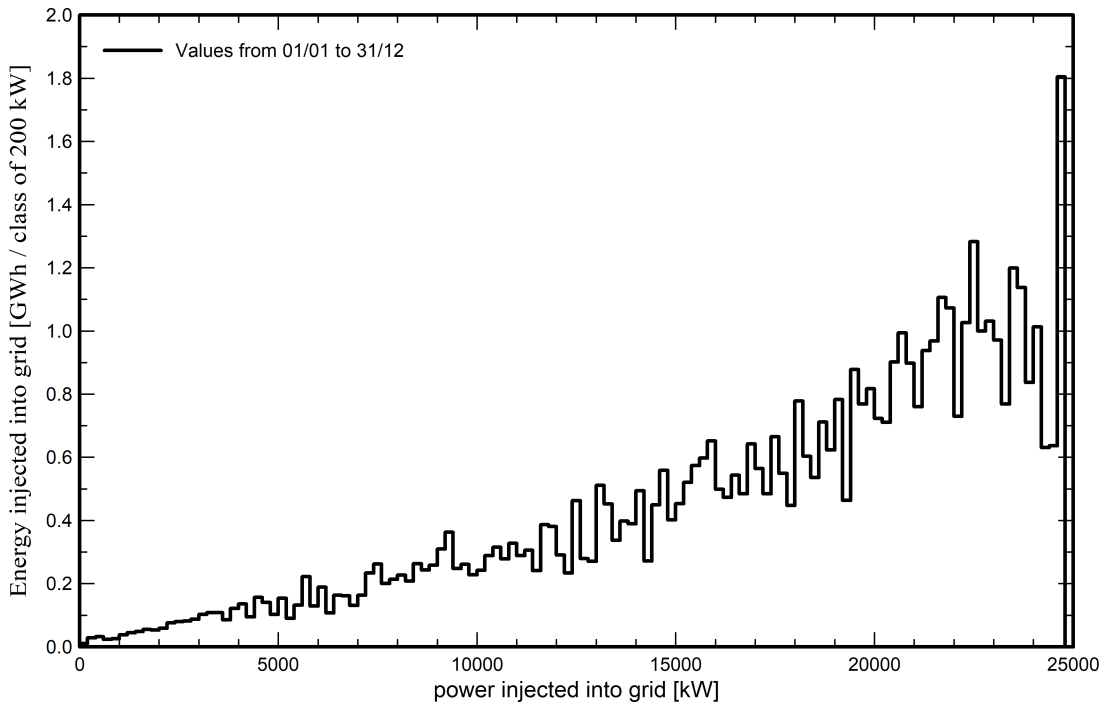


Predef. graphs

Daily Input/Output diagram



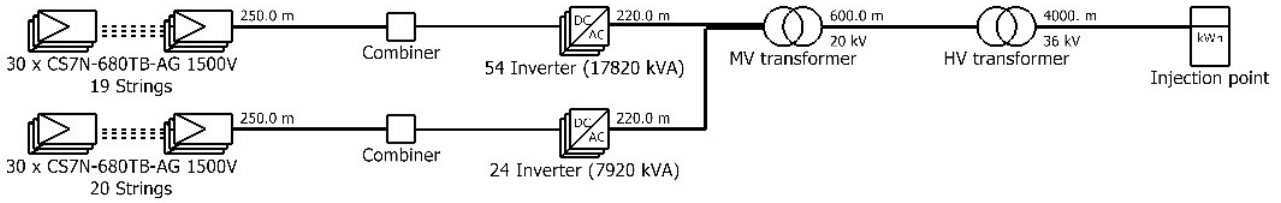
System Output Power Distribution





PVsyst V7.3.1
 VC0, Simulation date:
 06/12/23 10:31
 with v7.3.1

Single-line diagram



PV module	CS7N-680TB-AG 1500V
Inverter	SUN2000-330KTL-H1
String	30 x CS7N-680TB-AG 1500V

Masseria Scianne flyRen Development srl (Italia)

VC0 : Agrivoltaico

06/12/23