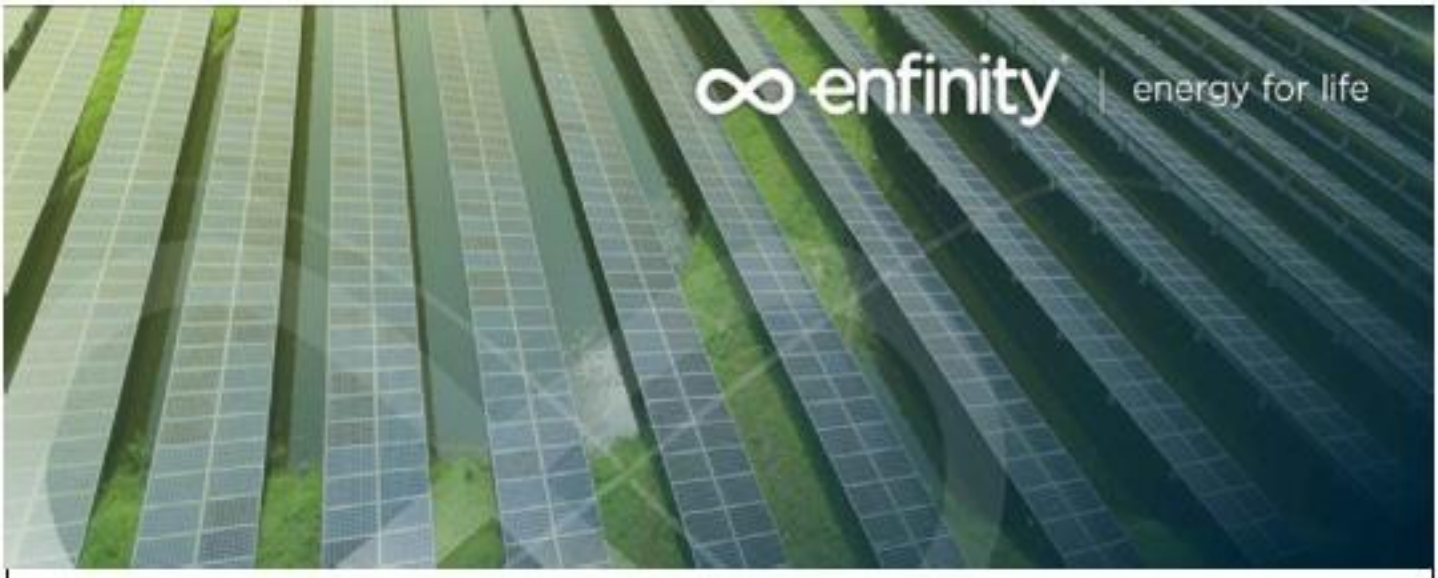

IMPIANTO FOTOVOLTAICO EG DOLOMITI SRL E OPERE CONNESSE

POTENZA IMPIANTO 38.5MWp
COMUNE DI ARGENTA (FE)

Proponente

EG DOLOMITI S.R.L.
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Alessandro Ceschiat
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Progettazione

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Firmato digitalmente da
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T = INGEGNERE
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Collaboratori

Progettazione Generale: Ing. Corrado Pluchino
Progettazione Elettrica: Ing. Andrea Fronteddu
Progettazione Civile e Idraulica: Ing. Fabio Lassini
Progettazione geotecnica-strutturale: Dott. Matteo Lana
Progettazione Ambientale e Paesaggistica: Dott.ssa Eleonora Lamanna

Coordinamento progettuale

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Titolo Elaborato

STIMA PRODUCIBILITA'

LIVELLO PROGETTAZIONE	CODICE ELABORATO	FILENAME	RIFERIMENTO	DATA	SCALA
PROGETTO DEFINITIVO	PD_REL_14	-	-	27.06.22	-

Revisioni

REV.	DATA	DESCRIZIONE	ESEGUITO	VERIFICATO	APPROVATO
00	27.06.2022	-	ML	CP	CP

COMUNE DI ARGENTA (FE)

REGIONE EMILIA ROMAGNA

STIMA PRODUCIBILITÁ

Version 7.2.16

PVsyst - Simulation report

Grid-Connected System

Project: Filo d'Argenta Project

Variant: 20220628 Filo d'Argenta TS 590W 4HF 7.88m 38.5Mwp 1380kWh

Sheds system

System power: 38.53 MWp

Argenta - Italy

Author

Enfinity Iberia SLU (Spain)

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Project summary

Geographical Site
Argenta
Italy

Situation

Latitude	44.61 °N
Longitude	11.99 °E
Altitude	-3 m
Time zone	UTC

Project settings

Albedo	0.20

Meteo data
Argenta
SolarGIS Monthly aver. , period not spec. - Synthetic

System summary

Grid-Connected System

Sheds system

PV Field Orientation

Fixed plane	
Tilt/Azimuth	22 / 0 °

Near Shadings

According to strings	
Electrical effect	80 %

User's needs
Unlimited load (grid)

System information

PV Array

Nb. of modules	65312 units
Pnom total	38.53 MWp

Inverters

Nb. of units	8 units
Pnom total	33.60 MWac
Grid power limit	30.17 MVA
Grid lim. Pnom ratio	1.277

Results summary

Produced Energy	53 GWh/year	Specific production	1380 kWh/kWp/year	Perf. Ratio PR	83.83 %
Apparent energy	53755 MVAh				

Table of contents

General parameters

Grid-Connected System

Sheds system

PV Field Orientation

Orientation	
Fixed plane	
Tilt/Azimuth	22 / 0 °

Sheds configuration	
Nb. of sheds	574 units
Sizes	
Sheds spacing	7.88 m
Collector width	5.27 m
Ground Cov. Ratio (GCR)	66.8 %
Shading limit angle	
Limit profile angle	33.3 °

Models used	
Transposition	Perez
Diffuse	Perez, Meteonorm
Circumsolar	separate

Horizon
Free Horizon

Near Shadings
According to strings
Electrical effect 80 %

User's needs
Unlimited load (grid)

Bifacial system
Model 2D Calculation
unlimited sheds

Bifacial model geometry		Bifacial model definitions	
Sheds spacing	7.88 m	Ground albedo average	0.16
Sheds width	5.27 m	Bifaciality factor	70 %
Limit profile angle	33.3 °	Rear shading factor	7.0 %
GCR	66.8 %	Rear mismatch loss	5.0 %
Height above ground	1.50 m	Shed transparent fraction	4.0 %

Monthly ground albedo values

Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Year
0.12	0.15	0.16	0.18	0.18	0.18	0.18	0.17	0.16	0.14	0.13	0.13	0.16

Grid injection point

Grid power limitation		Power factor	
Apparent power	30.17 MVA	Cos(phi) (leading)	0.990
Pnom ratio	1.277		

PV Array Characteristics

PV module

Manufacturer	Trina Solar
Model	TSM-590DEG20C.20
(Custom parameters definition)	
Unit Nom. Power	590 Wp
Number of PV modules	65312 units
Nominal (STC)	38.53 MWp
Modules	2041 Strings x 32 In series
At operating cond. (50°C)	
Pmpp	35.27 MWp
U mpp	990 V
I mpp	35621 A

Inverter

Manufacturer	Power Electronics
Model	FS4200K_660V_20210422E_Preliminary
(Custom parameters definition)	
Unit Nom. Power	4200 kVA
Number of inverters	8 units
Total power	33600 kVA
Operating voltage	934-1500 V
Pnom ratio (DC:AC)	1.15

Total PV power

Nominal (STC)	38534 kWp
Total	65312 modules
Module area	184841 m²
Cell area	172816 m²

Total inverter power

Total power	33600 kVA
Number of inverters	8 units
Pnom ratio	1.15

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. 0.49 mΩ
Loss Fraction 1.6 % at STC

LID - Light Induced Degradation
Loss Fraction 1.5 %

Module Quality Loss
Loss Fraction -0.8 %

Module mismatch losses
Loss Fraction 2.0 % at MPP

Strings Mismatch loss
Loss Fraction 0.1 %

IAM loss factor
Incidence effect (IAM): User defined profile

0°	40°	50°	60°	70°	75°	80°	85°	90°
1.000	1.000	0.998	0.992	0.983	0.961	0.933	0.853	0.000

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 660 Vac tri
Loss Fraction 0.90 % at STC
Inverter: FS4200K_660V_20210422E_Preliminary
Wire section (8 Inv.) Alu 8 x 3 x 2500 mm²
Average wires length 64 m

MV line up to Injection
MV Voltage 30 kV
Wires Alu 3 x 1000 mm²
Length 14500 m
Loss Fraction 1.96 % at STC

AC losses in transformers

MV transfo
Grid voltage 30 kV
Operating losses at STC
Nominal power at STC 37914 kVA
Iron loss (24/24 Connexion) 37.91 kW
Loss Fraction 0.10 % at STC
Coils equivalent resistance 3 x 0.13 mΩ
Loss Fraction 1.10 % at STC

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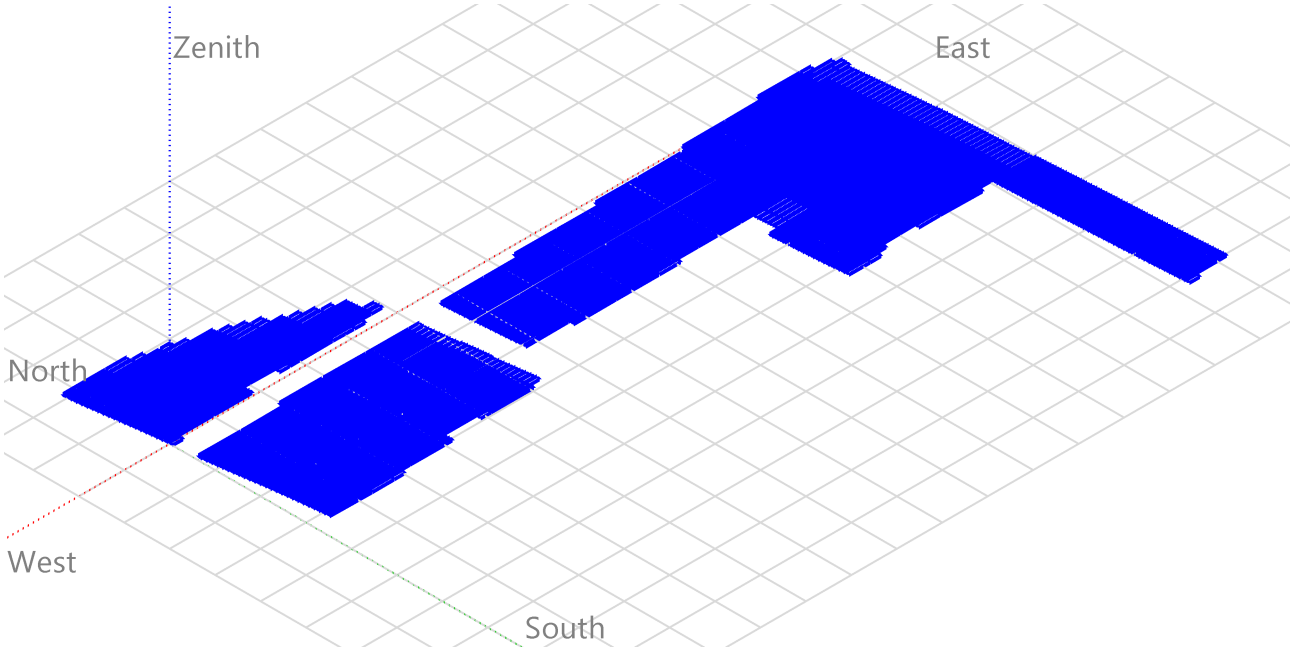
Near shadings parameter

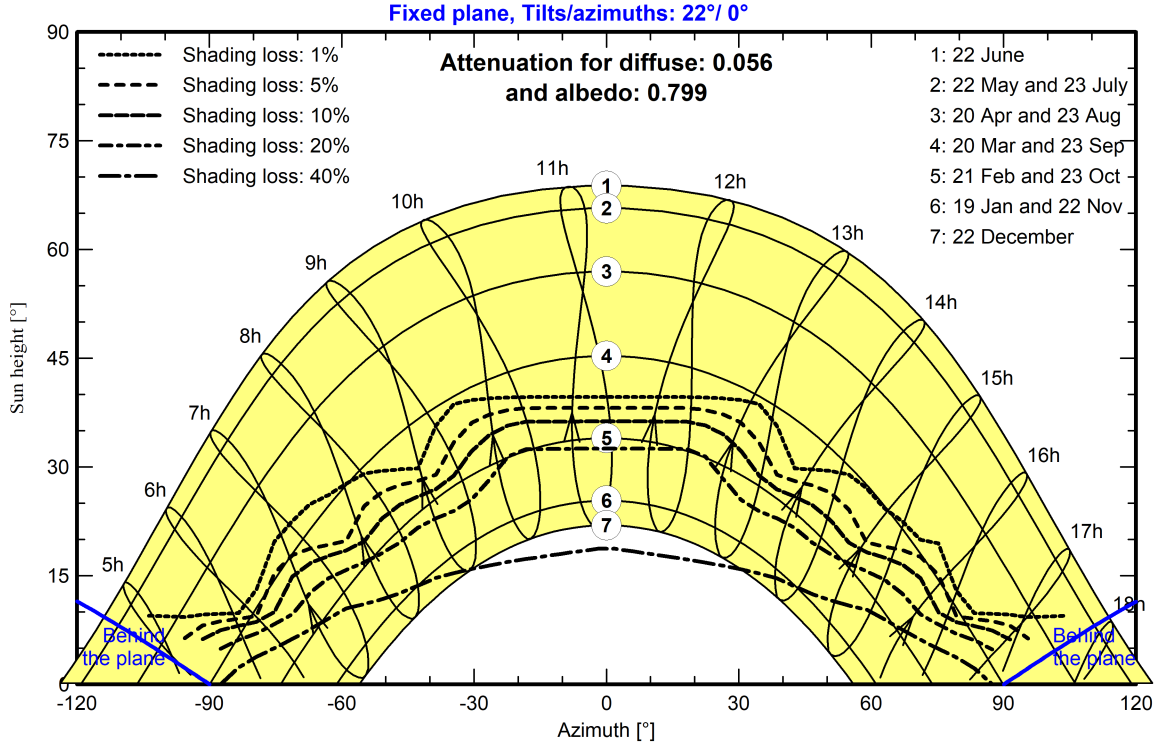
Perspective of the PV-field and surrounding shading scene



Iso-shadings diagram

Orientation #1

Fixed plane, Tilts/azimuths: 22°/ 0°



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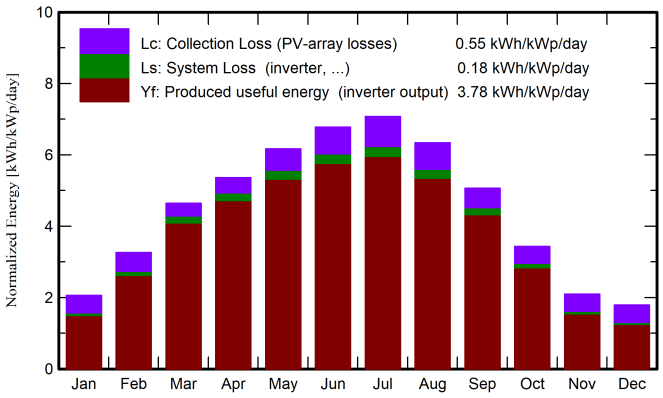
Main results

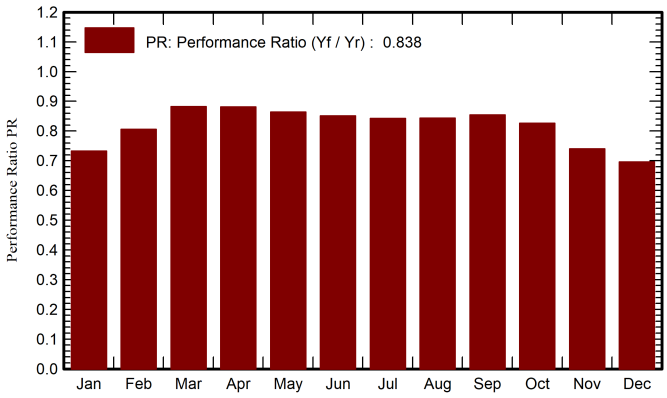
System Production

Produced Energy	53 GWh/year	Specific production	1380 kWh/kWp/year
Apparent energy	53755 MVAh	Performance Ratio PR	83.83 %

Normalized productions (per installed kWp)



Performance Ratio PR



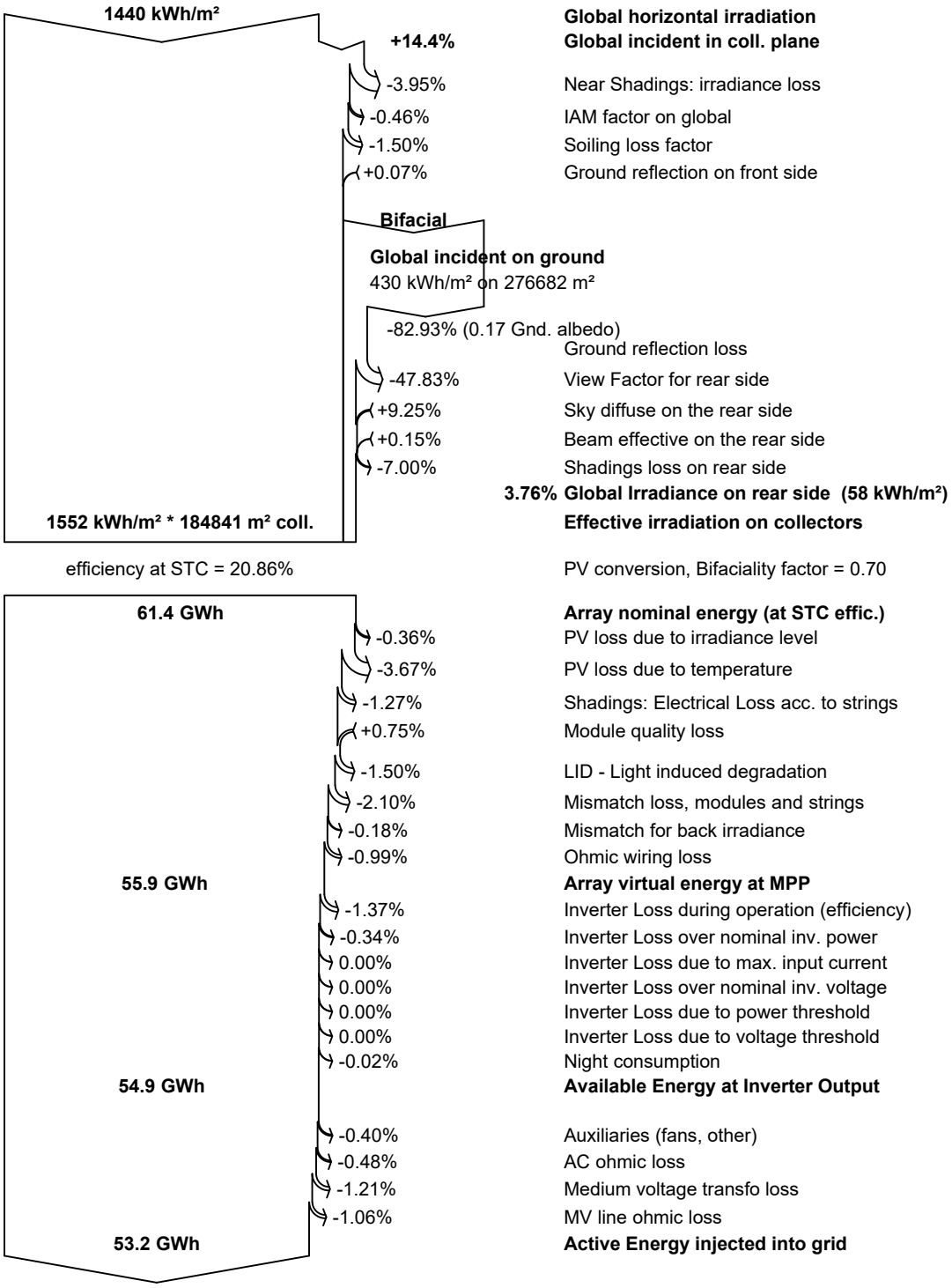
Balances and main results

	GlobHor kWh/m²	DiffHor kWh/m²	T_Amb °C	GlobInc kWh/m²	GlobEff kWh/m²	EArray GWh	E_Grid GWh	PR ratio
January	42.7	23.10	4.80	63.7	52.8	1.885	1.799	0.733
February	65.2	30.50	6.20	91.3	83.0	2.958	2.834	0.806
March	116.2	49.50	10.30	143.9	137.9	5.124	4.893	0.883
April	144.1	63.10	14.30	160.7	154.6	5.712	5.456	0.881
May	184.9	77.80	19.30	191.2	183.9	6.661	6.363	0.864
June	201.7	81.00	24.00	203.2	195.8	6.977	6.661	0.851
July	214.7	76.60	26.30	219.3	211.7	7.455	7.118	0.843
August	181.1	69.40	25.60	196.6	189.6	6.693	6.393	0.844
September	128.6	54.80	20.90	151.9	146.0	5.235	5.001	0.854
October	81.2	41.50	15.90	106.5	99.3	3.537	3.389	0.826
November	44.0	24.50	10.60	62.8	53.5	1.876	1.790	0.740
December	35.2	19.10	5.60	55.6	43.5	1.565	1.490	0.696
Year	1439.6	610.90	15.37	1646.6	1551.6	55.677	53.187	0.838

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



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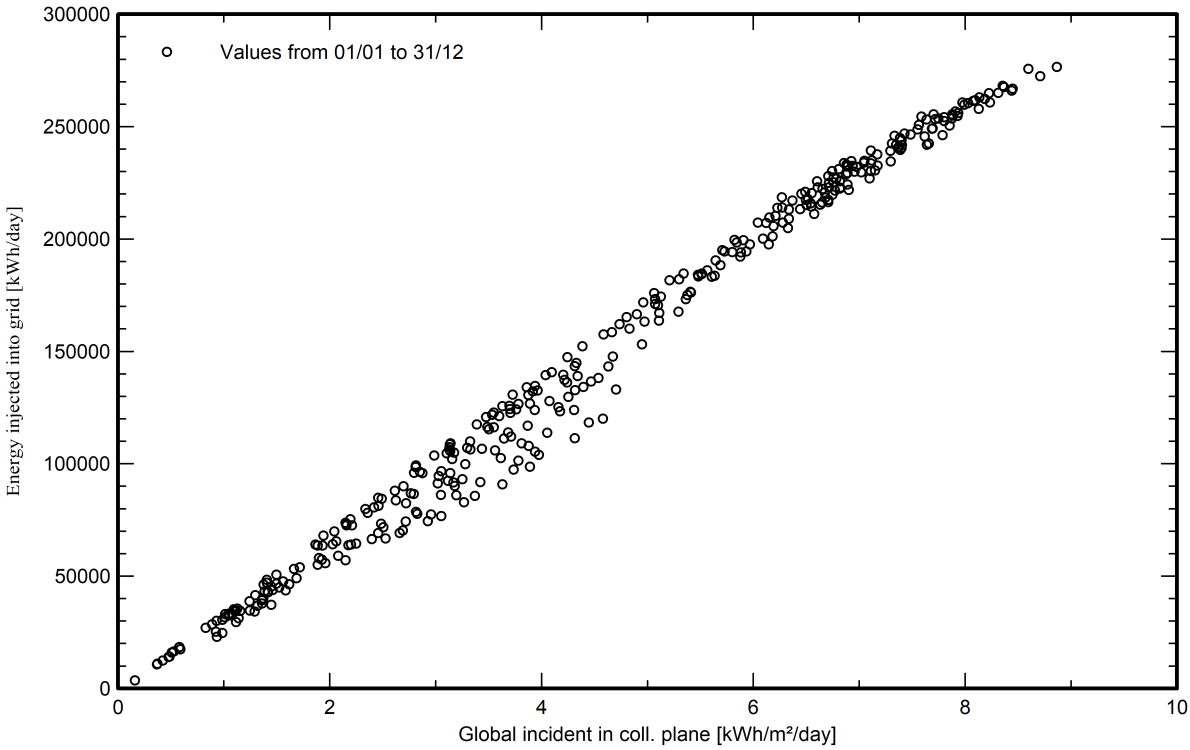
Special graphs

Daily Input/Output diagram



System Output Power Distribution