MINISTERO DELLA TRANSIZIONE ECOLOGICA

REGIONE:	PROVINCIA:
SICILIA	PALERMO
COMUNI:	**LOCALITA':**
MEZZOJUSO, CAMPOFELICE DI FITALIA, CIMINNA	C/da Farra,C/da Fondacazzo, C/da Pizzo Mezzaluna. C/da Porrazzi

TIPO PROGETTO:	OGGETTO:
PD	Progetto per la realizzazione di un impianto agrovoltaico denominato 'Agrovoltaico Mezzojuso' per la produzione di energia elettrica con una potenza installata di 52,56 MW, potenza di immissione di 50,00 MW e potenza del sistema di accumulo di 10 MW, per la produzione agricola di beni e servizi oltre alle opere connesse e alle infrastrutture indispensabili nelle aree identificate nei comuni di Mezzojuso (PA), Campofelice di Fitalia (PA) e Ciminna (PA).

TAVOLA N.:	IMPIANTO:		SCALA
168	AGROVOLTAICO MEZZOJUSO	RT	
	ELABORATO:	COD. DOC.	REV.
	Report PVSyst	SP02ELRT168	

PROPONENTE:	RESPONSABILE:	APPROVATO DA:
FRI-ELSUN	*Timbro e Firma*	*Timbro e Firma*

PROGETTISTA	DIRETTORE TECNICO: ARCH: FRANCESCO LAUDICINA	REDATTO DA:
SUPER CORP	*Timbro e Firma*	*Timbro e Firma*

REV.	DATA	REDATTO	DESCRIZIONE
0			
1			
2			
3			

Firmato digitalmente da
FRANCESCO LAUDICINA
SerialNumber = TINIT-LDCFNC70P02G273L
C = IT

Version 7.4.0

PVsyst - Simulation report

Grid-Connected System

Progetto: Impianto PV_MEZZOJUSO

Località:Mezzojuso (PA)

Inseguitore Monoassiale N-S con Backtraking

System power: 52.56 MWp

Villafrati - Italy

Progettisti

SUPER CORP

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Project summary

Geographical Site
Villafrati
Italia

Situation

Latitude	37.91 °N
Longitude	13.48 °E
Altitude	458 m
Time zone	UTC+1

Project settings

Albedo	0.20

Meteo data
Villafrati
PVGIS api TMY

System summary

Grid-Connected System — **Inseguitore Monoassiale N-S con Backtraking**

PV Field Orientation
Orientation

Tracking plane, tilted axis	
Avg axis tilt	-2.8 °
Avg axis azim.	0 °

Tracking algorithm
Irradiance optimization
Backtracking activated

Near Shadings
Linear shadings

Diffuse shading	Automatic

System information
PV Array

Nb. of modules	82128 units
Pnom total	52.56 MWp

Inverters

Nb. of units	234 units
Pnom total	50.31 MWac
Pnom ratio	1.045

User's needs
Unlimited load (grid)

Results summary

Produced Energy	90705.79 MWh/year	Specific production	1726 kWh/kWp/year	Perf. Ratio PR	78.16 %

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General parameters

Grid-Connected System — **Inseguitore Monoassiale N-S con Backtraking**

PV Field Orientation

Orientation

Tracking plane, tilted axis	
Avg axis tilt	-2.8 °
Avg axis azim.	0 °

Tracking algorithm

Irradiance optimization	
Backtracking activated	

Backtracking array

Nb. of trackers	3426 units

Sizes

Tracker Spacing	7.80 m
Collector width	4.82 m
Ground Cov. Ratio (GCR)	61.8 %
Phi min / max.	-/+ 60.0 °

Backtracking strategy

Phi limits for BT	-/+ 51.7 °
Backtracking pitch	5.00 m
Backtracking width	2.29 m

Models used

Transposition	Perez
Diffuse	Imported
Circumsolar	separate

Horizon

Average Height	6.6 °

Near Shadings

Linear shadings	
Diffuse shading	Automatic

User's needs

Unlimited load (grid)

PV Array Characteristics

PV module

Manufacturer	Jinkosolar
Model	JKM640M-7RL4
(Custom parameters definition)	
Unit Nom. Power	640 Wp
Number of PV modules	82128 units
Nominal (STC)	52.56 MWp
Modules	3422 Strings x 24 In series
At operating cond. (50°C)	
Pmpp	46.41 MWp
U mpp	978 V
I mpp	47471 A

Inverter

Manufacturer	Huawei Technologies
Model	SUN2000-215KTL-H1
(Custom parameters definition)	
Unit Nom. Power	215 kWac
Number of inverters	234 units
Total power	50310 kWac
Operating voltage	550-1500 V
Pnom ratio (DC:AC)	1.04
Power sharing within this inverter	

Total PV power

Nominal (STC)	52562 kWp
Total	82128 modules
Module area	224544 m²
Cell area	315174 m²

Total inverter power

Total power	50310 kWac
Number of inverters	234 units
Pnom ratio	1.04

Array losses

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.	0.34 mΩ
Loss Fraction	1.5 % at STC

Serie Diode Loss

Voltage drop	0.7 V
Loss Fraction	0.1 % at STC

Module Quality Loss

Loss Fraction	-0.8 %

Module mismatch losses

Loss Fraction	2.0 % at MPP

Strings Mismatch loss

Loss Fraction	0.1 %

Array losses

IAM loss factor

Incidence effect (IAM): Fresnel smooth glass, n = 1.526

0°	30°	50°	60°	70°	75°	80°	85°	90°
1.000	0.998	0.981	0.948	0.862	0.776	0.636	0.403	0.000

Spectral correction

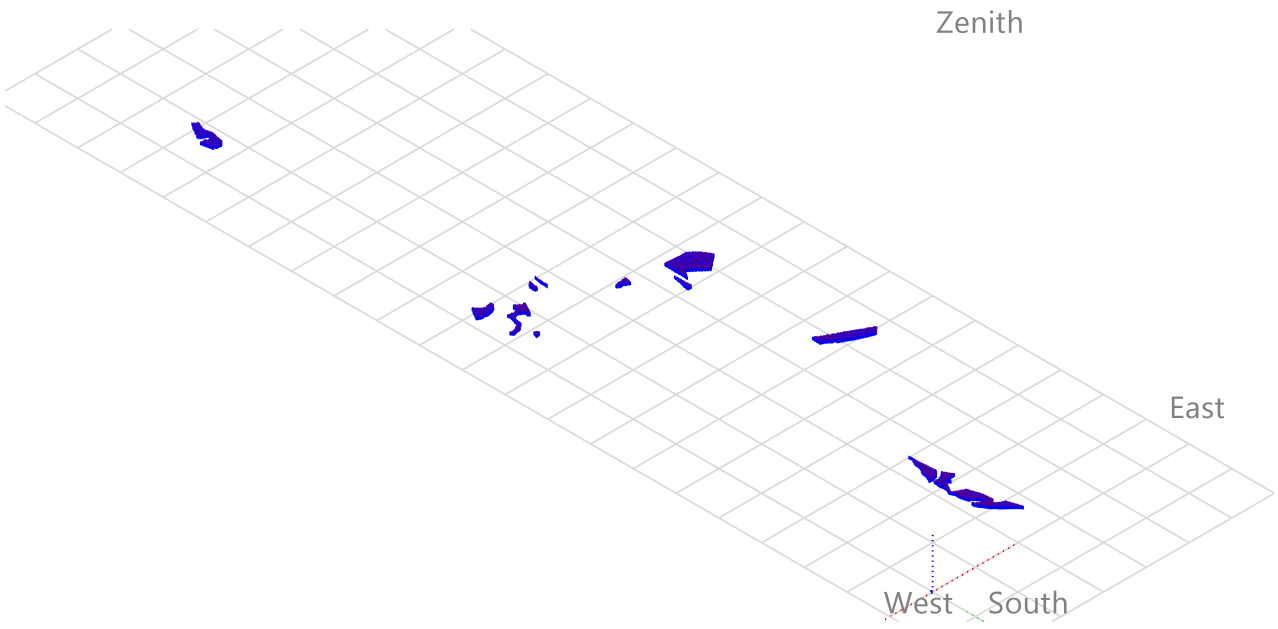
FirstSolar model

Precipitable water estimated from relative humidity

Coefficient Set	C0	C1	C2	C3	C4	C5
Monocrystalline Si	0,85914	-0,02088	-0,0058853	0,12029	0,026814	-0,001781

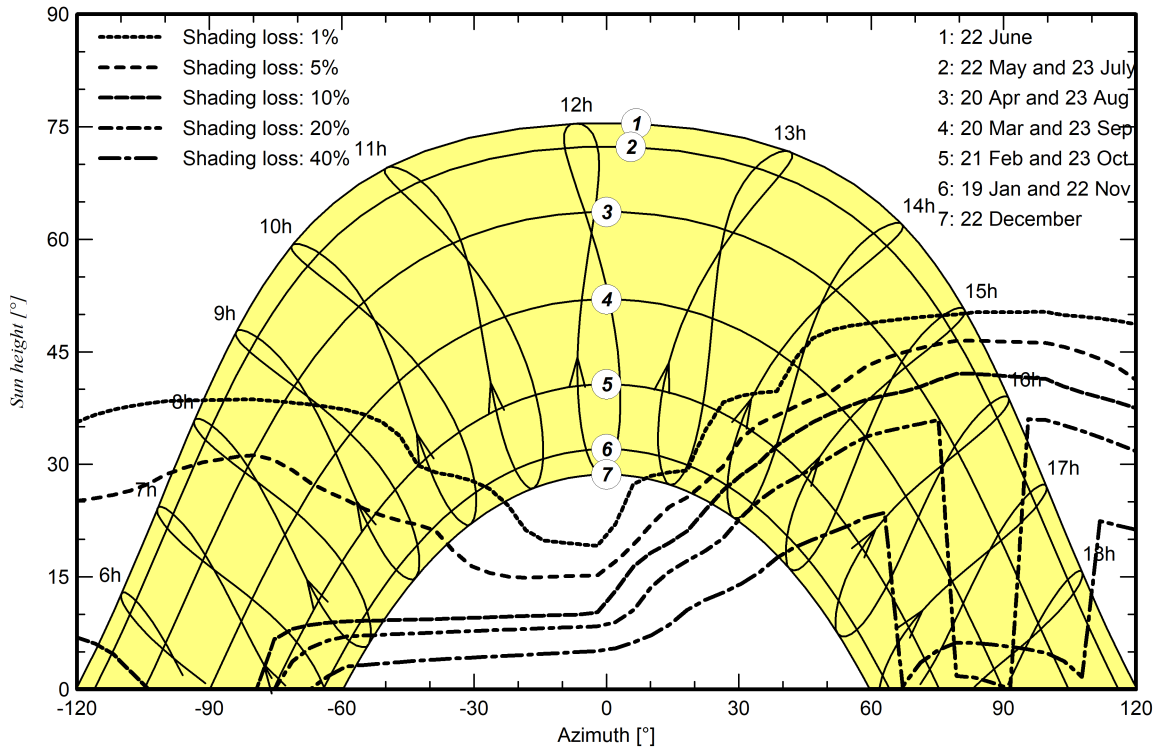
Near shadings parameter

Perspective of the PV-field and surrounding shading scene



Iso-shadings diagram

Orientation #1



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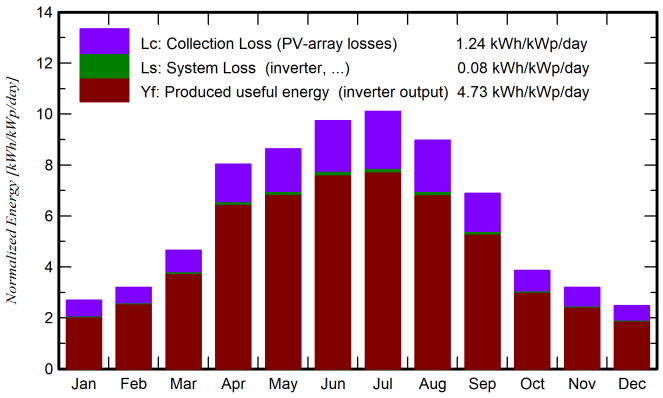
Main results

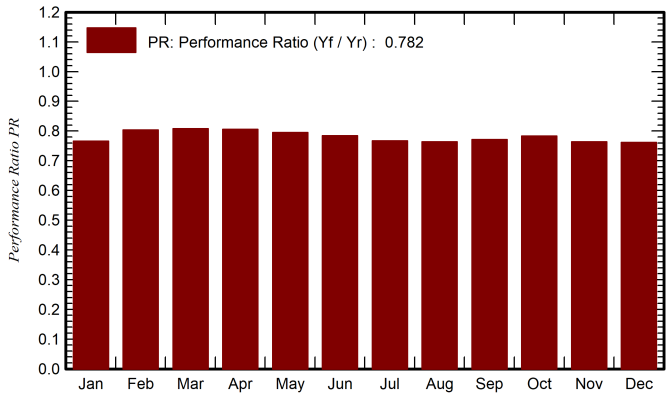
System Production

Produced Energy	90705.79 MWh/year	Specific production	1726 kWh/kWp/year
		Perf. Ratio PR	78.16 %

Normalized productions (per installed kWp)



Performance Ratio PR



Balances and main results

	GlobHor	DiffHor	T_Amb	GlobInc	GlobEff	EArray	EArrMPP	EffSysR	EArray	EffSysR
	kWh/m²	kWh/m²	°C	kWh/m²	kWh/m²	MWh	MWh	%	MWh	%
January	68.3	30.08	11.80	83.4	70.0	3411	3411	17.93	3411	17.93
February	74.4	41.14	9.23	89.5	78.6	3842	3842	18.80	3842	18.80
March	116.5	55.59	11.28	144.3	129.0	6229	6229	18.92	6229	18.92
April	191.1	66.95	12.93	241.0	217.9	10372	10372	18.86	10372	18.86
May	211.9	70.26	16.76	267.6	244.0	11375	11375	18.61	11375	18.61
June	228.4	72.24	20.29	292.0	266.5	12243	12243	18.35	12243	18.35
July	241.2	63.14	24.89	313.1	285.2	12849	12849	17.96	12849	17.96
August	214.0	61.78	24.67	278.2	251.5	11365	11365	17.88	11365	17.88
September	162.4	56.12	22.34	206.6	185.0	8519	8519	18.06	8519	18.06
October	99.6	49.47	19.16	119.6	107.0	5009	5009	18.33	5009	18.33
November	77.0	32.21	16.30	95.7	81.7	3910	3910	17.89	3910	17.89
December	64.4	32.69	12.85	77.0	64.5	3132	3132	17.82	3132	17.82
Year	1749.2	631.68	16.93	2208.0	1980.9	92255	92255	18.30	92255	18.30

Legends

GlobHor	Global horizontal irradiation	EArray	Effective energy at the output of the array
DiffHor	Horizontal diffuse irradiation	EArrMPP	Array virtual energy at MPP
T_Amb	Ambient Temperature	EffSysR	Effic. Eout system / rough area
GlobInc	Global incident in coll. plane	EArray	Effective energy at the output of the array
GlobEff	Effective Global, corr. for IAM and shadings	EffSysR	Effic. Eout system / rough area

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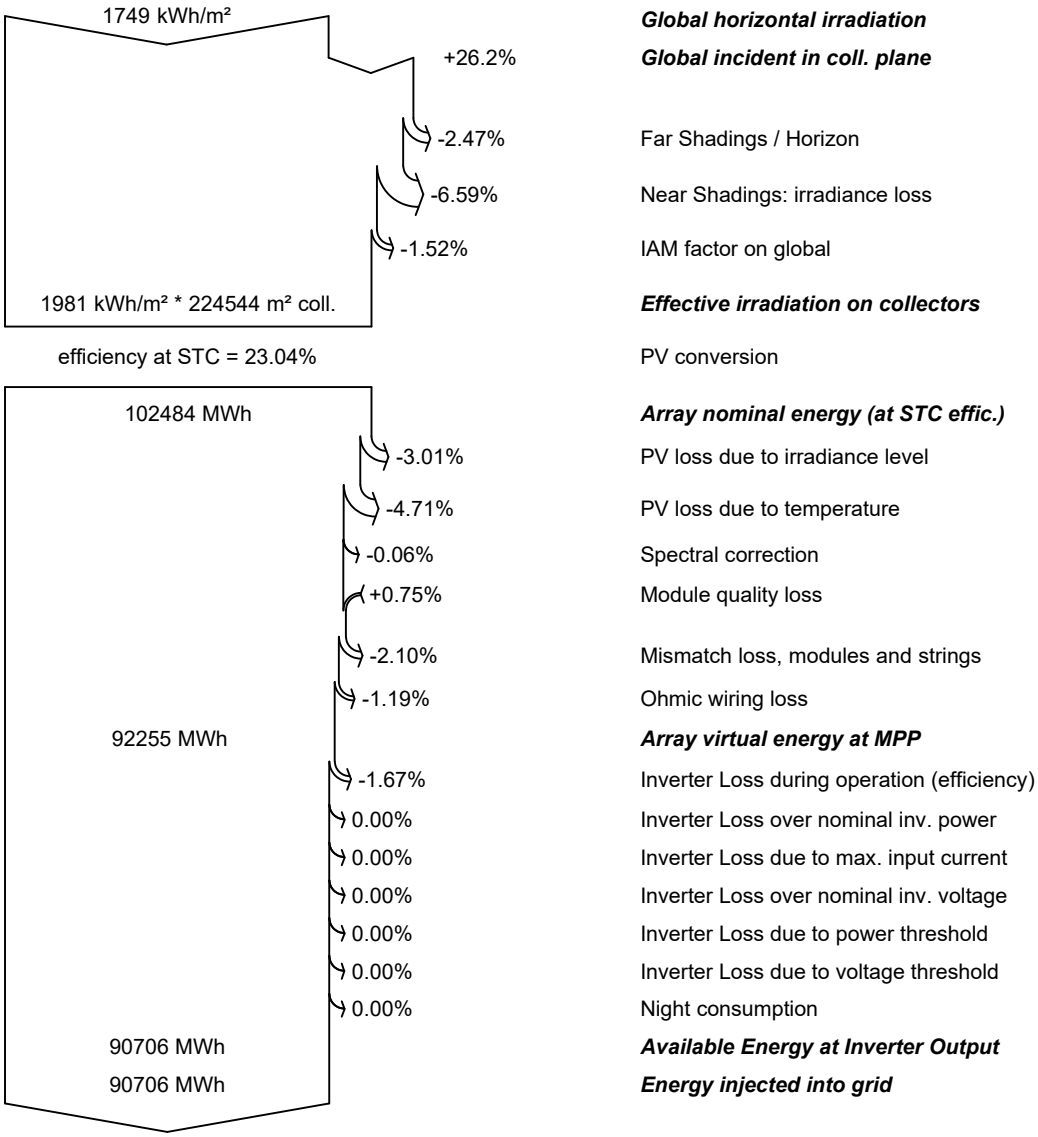
Loss diagram



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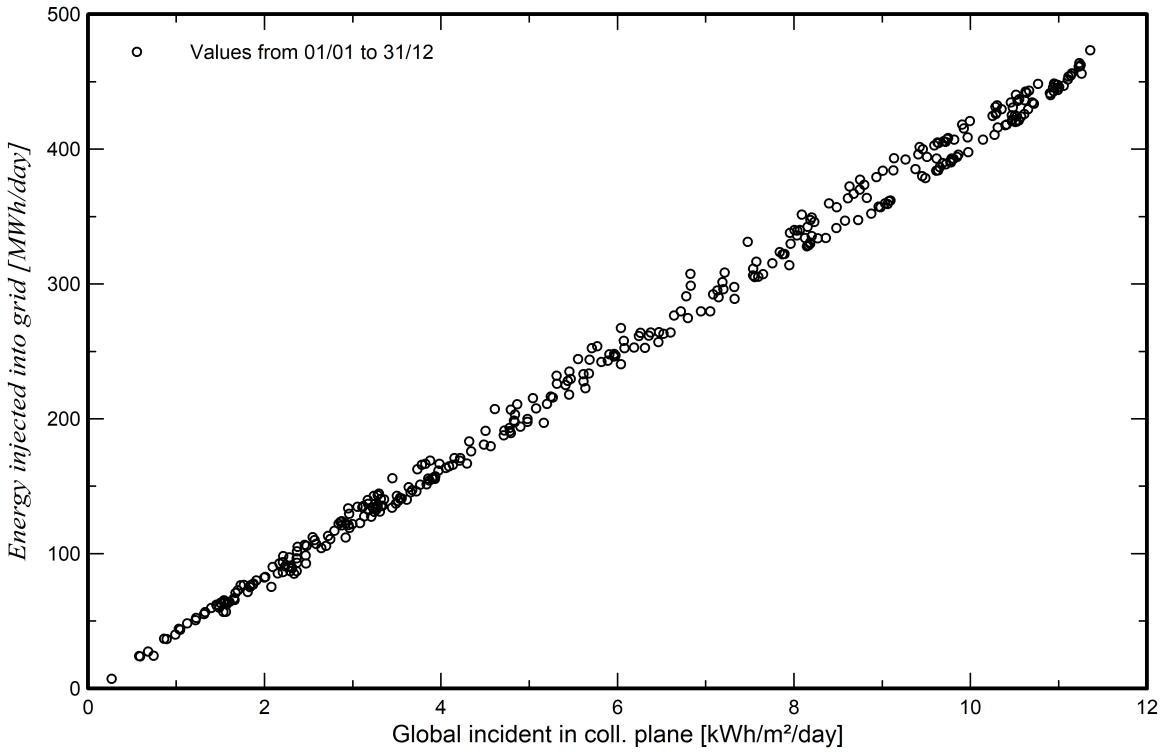
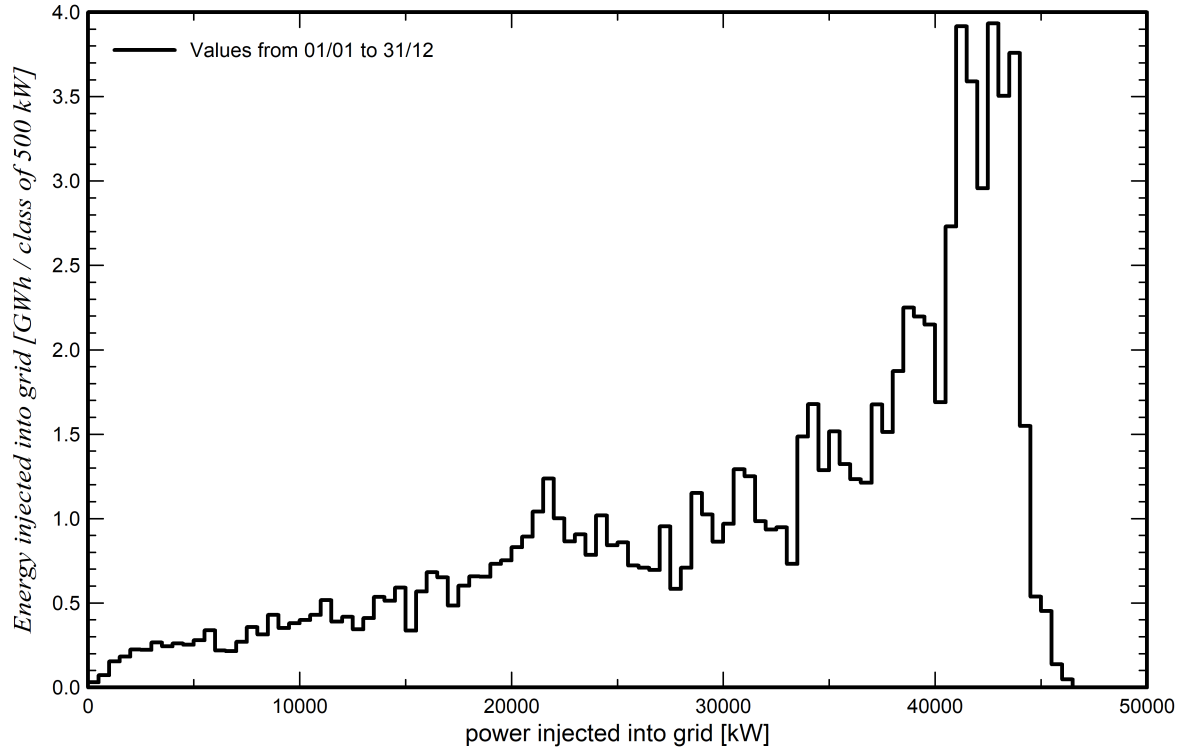
Predef. graphs

Diagramma giornaliero entrata/uscita



Distribuzione potenza in uscita sistema



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P50 - P90 evaluation

Meteo data

Source	PVGIS api TMY
Kind	Own measured
Year	TMY
Year-to-year variability(Variance)	-1.0 %

Specified Deviation

Year deviation from average	0.0 %

Global variability (meteo + system)

Variability (Quadratic sum)	2.1 %

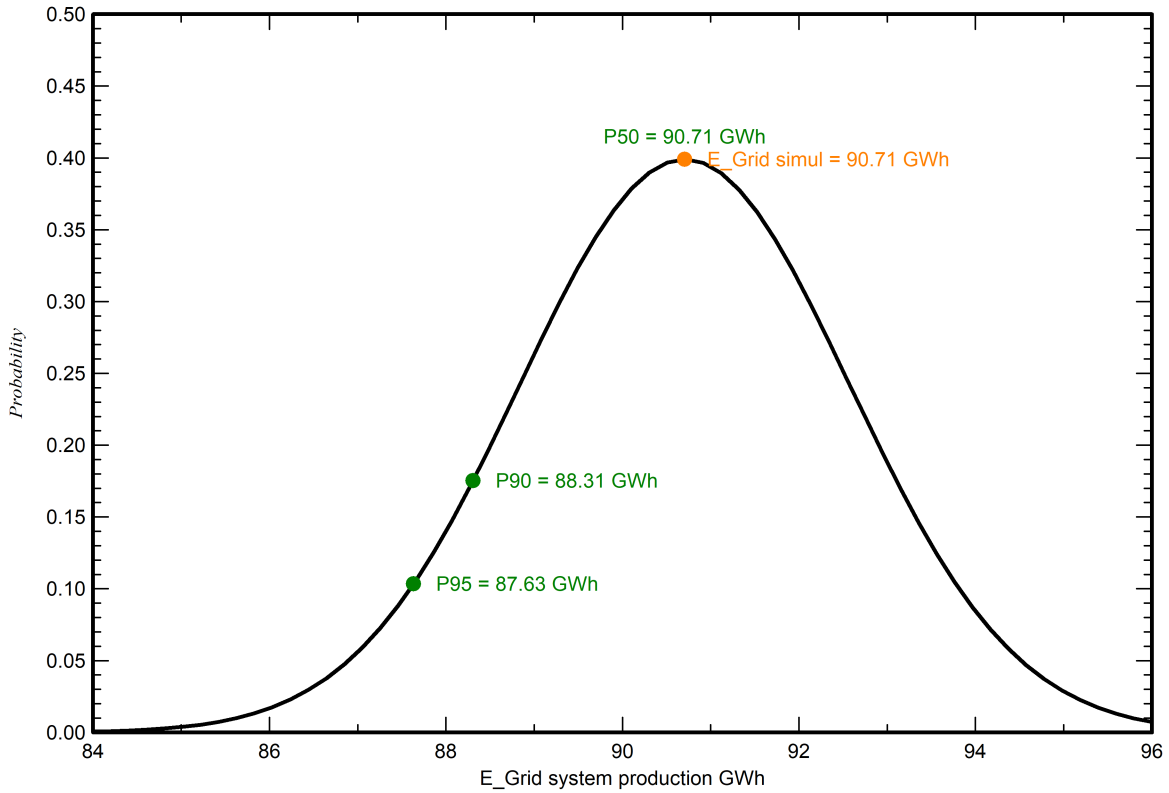
Simulation and parameters uncertainties

PV module modelling/parameters	1.0 %
Inverter efficiency uncertainty	0.5 %
Soiling and mismatch uncertainties	1.0 %
Degradation uncertainty	1.0 %

Annual production probability

Variability	1.87 GWh
P50	90.71 GWh
P90	88.31 GWh
P95	87.63 GWh

Probability distribution



Single-line diagram

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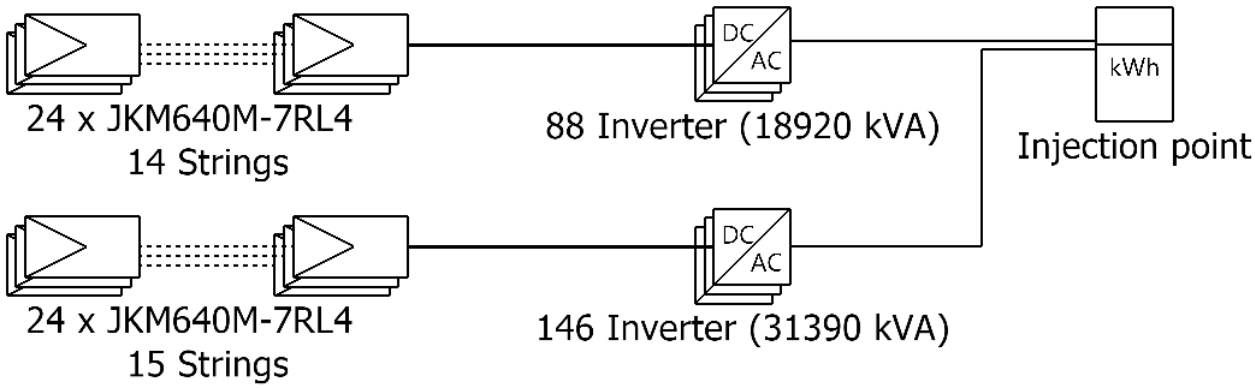

PV module	JKM640M-7RL4
Inverter	SUN2000-215KTL-H1
String	24 x JKM640M-7RL4

	SuperCorp Project_PV	
	VIO : Nuova variante di simulazione - MEZZOJUSO	26/03/24