



PROVINCIA DI
CALTANISSETTA



COMUNE DI
GELA



REGIONE
SICILIANA

PROGETTO PER LA REALIZZAZIONE DI UN IMPIANTO AGRIVOLTAICO

NEL COMUNE DI GELA (CL)

Potenza massima di picco: 49.011 kWp
Potenza massima di immissione: 48.000 kW

ELABORATI PROGETTUALI

CODICE ELABORATO

TITOLO ELABORATO

AF.R15

CALCOLO DI PRODUCIBILITA' IMPIANTO

COMMITTENTE



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Enrico Gadaleta

documento firmato digitalmente

PROGETTAZIONE

2ASINERGY

#innovativeengineering

2A SINERGY S.r.l. S.B.

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ENTI

DATA: LUGLIO 2023

SCALA: -

FORMATO CARTA: A4

PVsyst - Simulation report

Grid-Connected System

Project: GELA

Variant: fissa 20gradi 3 m - 49 MWp

Sheds, single array

System power: 49.01 MWp

Siriac Srl - Italia



Project: GELA

Variant: fissa 20gradi 3 m - 49 MWp

PVsyst V7.4.0

VC3, Simulation date:
11/07/23 17:30
with v7.4.0

Mare srls (Italy)

Project summary

Geographical Site	Situation	Project settings
Siriac Srl	Latitude	Albedo
Italia	37.06 °N	0.20
	Longitude	
	14.42 °E	
	Altitude	
	121 m	
	Time zone	
	UTC+1	
Meteo data		
Siriac Srl		
PVGIS api TMY		

System summary

Grid-Connected System	Sheds, single array	
PV Field Orientation	Near Shadings	User's needs
Fixed plane	Linear shadings	Unlimited load (grid)
Tilt/Azimuth		
20 / 0 °		
System information		
PV Array		
Nb. of modules	69030 units	Inverters
Pnom total	49.01 MWp	Nb. of units
		16 units
		Pnom total
		44.00 MWac
		Pnom ratio
		1.114

Results summary

Produced Energy	93926433 kWh/year	Specific production	1916 kWh/kWp/year	Perf. Ratio PR	86.36 %
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General parameters

Grid-Connected System		Sheds, single array			
PV Field Orientation		Sheds configuration		Models used	
Orientation		Nb. of sheds	222 units	Transposition	Perez
Fixed plane		Single array		Diffuse	Imported
Tilt/Azimuth	20 / 0 °	Sizes		Circumsolar	separate
		Sheds spacing	5.63 m		
		Collector width	2.63 m		
		Ground Cov. Ratio (GCR)	46.6 %		
		Top inactive band	0.02 m		
		Bottom inactive band	0.02 m		
		Shading limit angle			
		Limit profile angle	16.1 °		
Horizon		Near Shadings		User's needs	
Free Horizon		Linear shadings		Unlimited load (grid)	

PV Array Characteristics

PV module		Inverter	
Manufacturer	SUNERGY	Manufacturer	SMA
Model	SUNERGY 710	Model	Sunny Central 2750-EV
(Custom parameters definition)		(Original PVsyst database)	
Unit Nom. Power	710 Wp	Unit Nom. Power	2750 kWac
Number of PV modules	69030 units	Number of inverters	16 units
Nominal (STC)	49.01 MWp	Total power	44000 kWac
Modules	2655 Strings x 26 In series	Operating voltage	875-1425 V
At operating cond. (50°C)		Pnom ratio (DC:AC)	1.11
Pmpp	45.64 MWp		
U mpp	1024 V		
I mpp	44584 A		
Total PV power		Total inverter power	
Nominal (STC)	49011 kWp	Total power	44000 kWac
Total	69030 modules	Number of inverters	16 units
Module area	214431 m ²	Pnom ratio	1.11

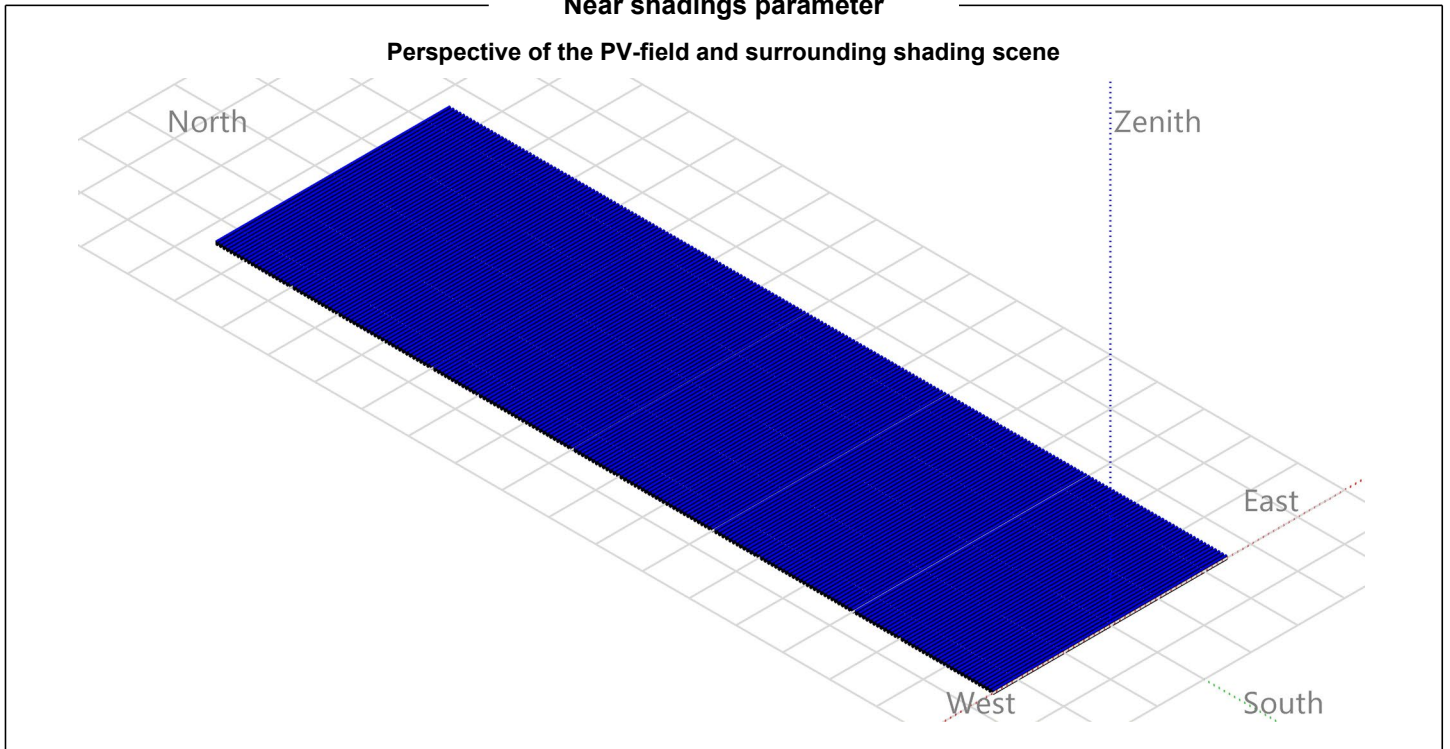
Array losses

Thermal Loss factor		DC wiring losses		Module Quality Loss				
Module temperature according to irradiance		Global array res.	0.38 mΩ	Loss Fraction	-1.3 %			
Uc (const)	20.0 W/m ² K	Loss Fraction	1.5 % at STC					
Uv (wind)	0.0 W/m ² K/m/s							
Module mismatch losses		Strings Mismatch loss						
Loss Fraction	2.0 % at MPP	Loss Fraction	0.1 %					
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



Near shadings parameter

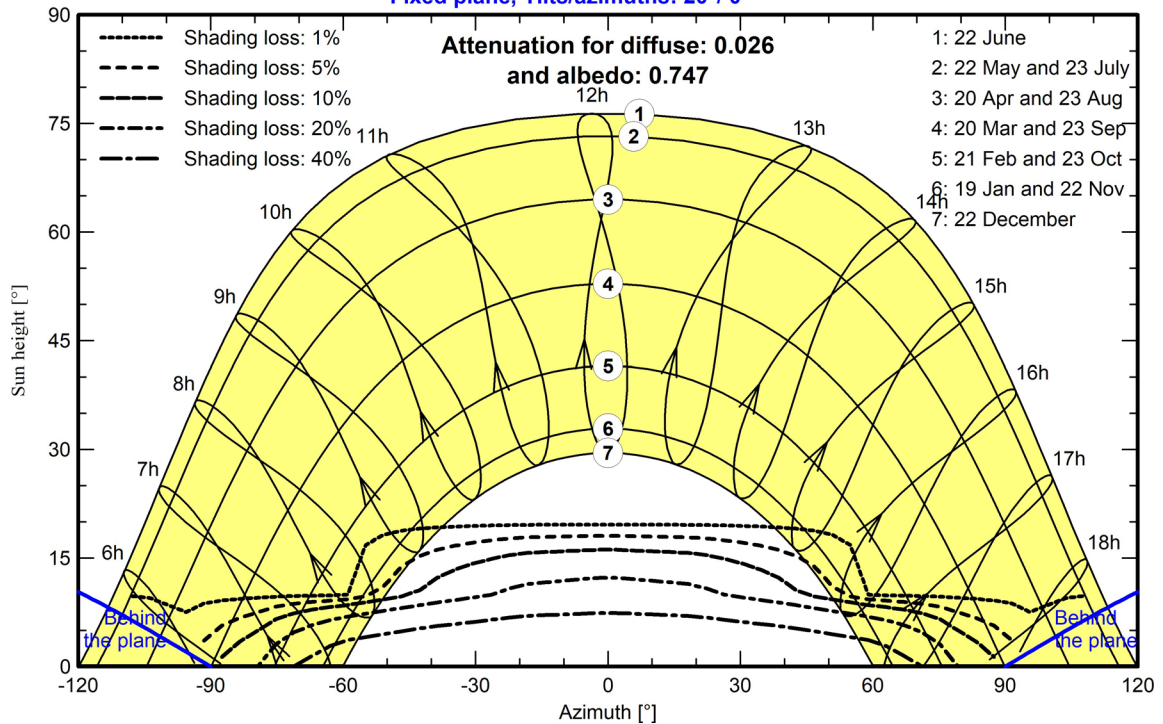
Perspective of the PV-field and surrounding shading scene



Iso-shadings diagram

Orientation #1

Fixed plane, Tilts/azimuths: 20°/ 0°





Main results

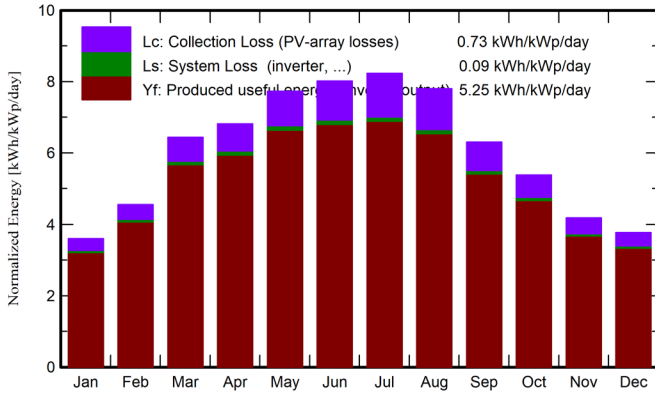
System Production

Produced Energy 93926433 kWh/year

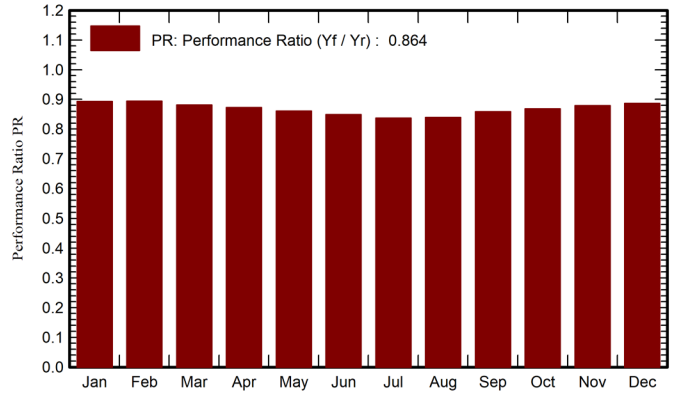
Specific production
Perf. Ratio PR

1916 kWh/kWp/year
86.36 %

Normalized productions (per installed kWp)



Performance Ratio PR



Balances and main results

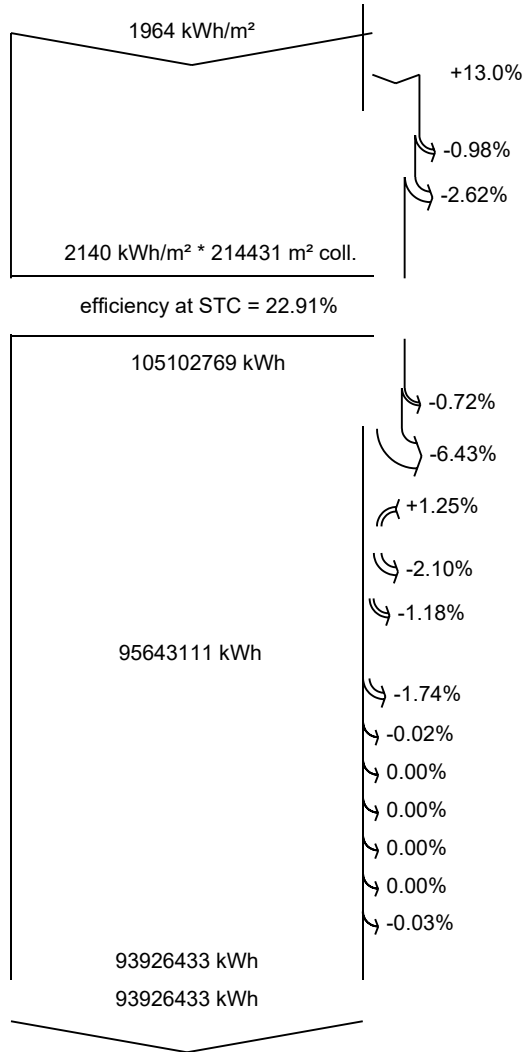
	GlobHor kWh/m ²	DiffHor kWh/m ²	T_Amb °C	GlobInc kWh/m ²	GlobEff kWh/m ²	EArray kWh	E_Grid kWh	PR ratio
January	77.7	30.20	10.03	111.8	106.4	4982629	4891971	0.893
February	97.7	37.59	11.27	127.5	122.6	5694430	5591380	0.895
March	167.0	49.98	13.85	199.5	193.0	8774299	8616187	0.881
April	189.9	63.93	15.30	204.5	197.6	8905411	8744036	0.872
May	236.6	65.65	19.54	239.6	231.5	10282946	10099572	0.860
June	245.4	58.52	22.59	240.6	232.4	10190831	10010894	0.849
July	256.5	56.68	26.14	255.1	246.5	10654626	10469430	0.837
August	228.9	53.92	26.12	241.9	234.1	10124579	9948455	0.839
September	164.6	53.78	23.36	189.2	183.3	8099836	7958267	0.858
October	131.0	42.19	20.94	166.8	161.3	7226528	7100175	0.868
November	89.8	32.21	17.16	125.7	120.3	5510122	5412564	0.879
December	78.3	29.92	12.29	117.0	110.8	5175653	5083502	0.886
Year	1963.6	574.59	18.26	2219.1	2139.8	95621892	93926433	0.864

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

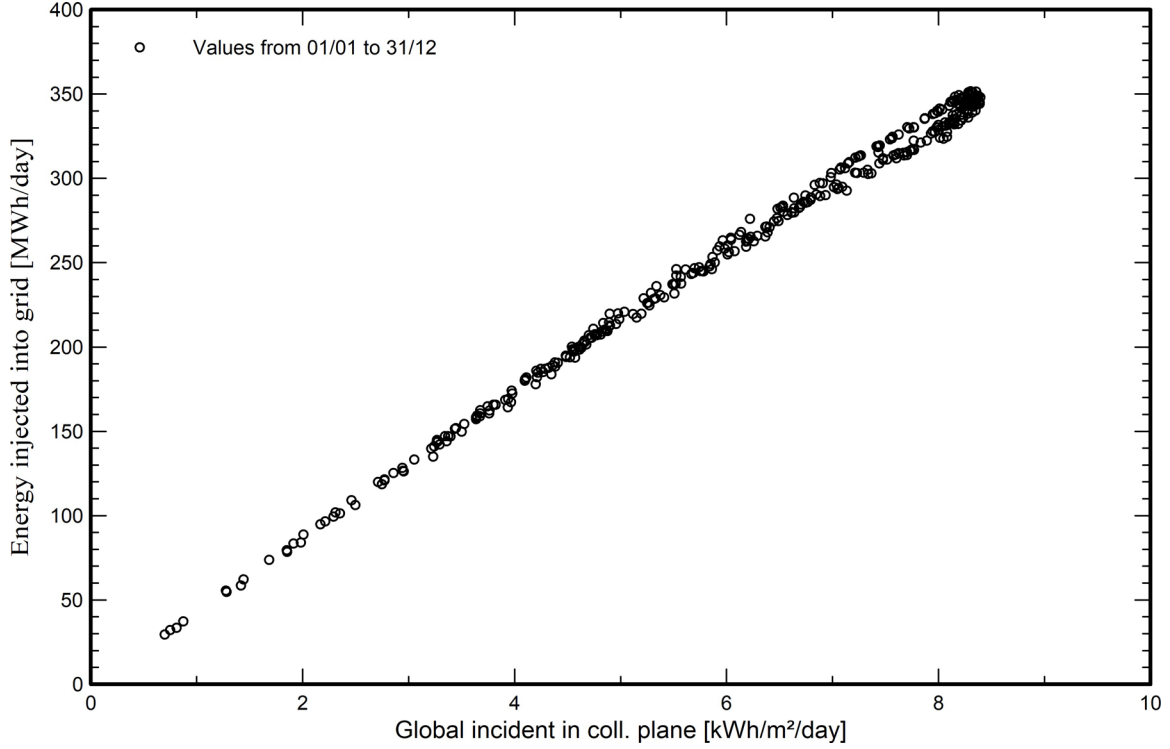


- Global horizontal irradiation**
- Global incident in coll. plane**
- Near Shadings: irradiance loss
- IAM factor on global
- Effective irradiation on collectors**
- PV conversion
- Array nominal energy (at STC effic.)**
- PV loss due to irradiance level
- PV loss due to temperature
- Module quality loss
- Mismatch loss, modules and strings
- Ohmic wiring loss
- Array virtual energy at MPP**
- Inverter Loss during operation (efficiency)
- Inverter Loss over nominal inv. power
- Inverter Loss due to max. input current
- Inverter Loss over nominal inv. voltage
- Inverter Loss due to power threshold
- Inverter Loss due to voltage threshold
- Night consumption
- Available Energy at Inverter Output**
- Energy injected into grid**

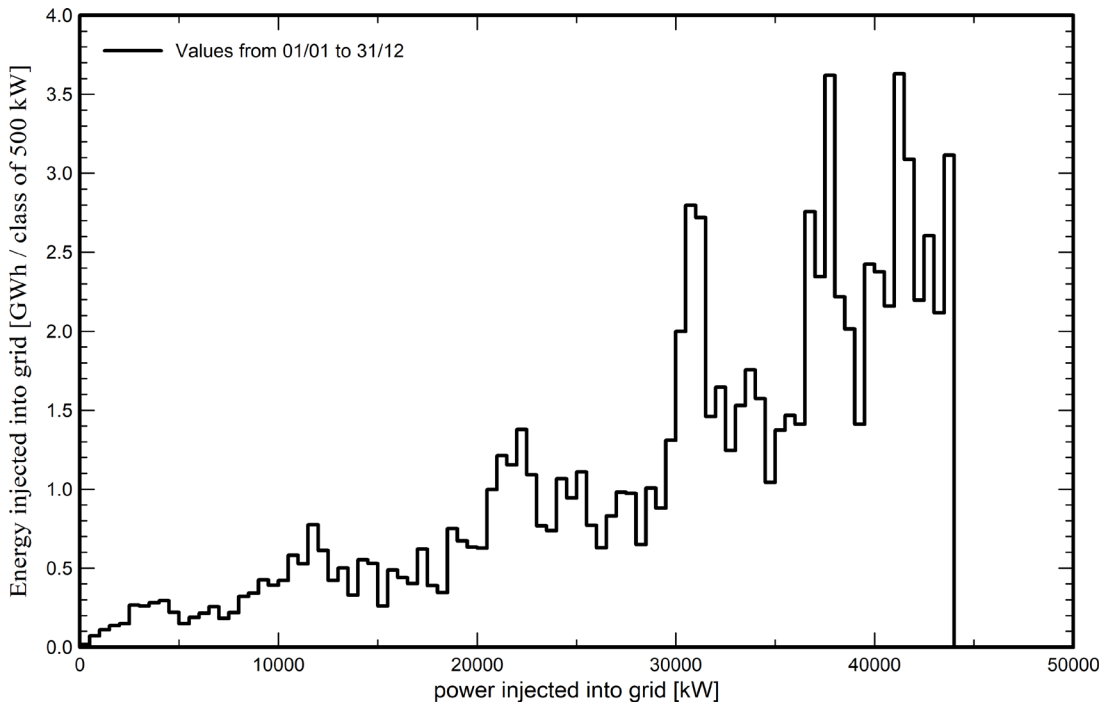


Predef. graphs

Diagramma giornaliero entrata/uscita



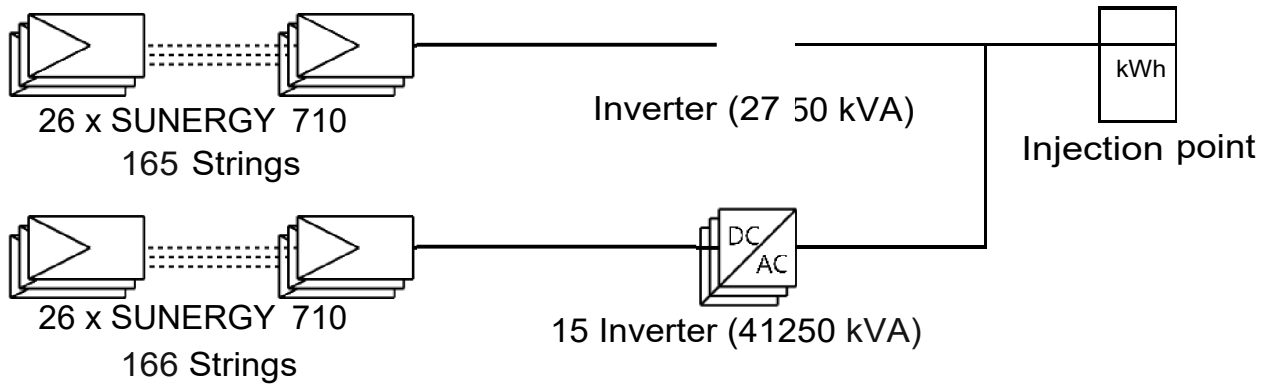
Distribuzione potenza in uscita sistema





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Single-line diagram



PV module	SUNERGY 710
Inverter	Sunny Centrali 2750-EV
String	26 x SUNERGY 710

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