CLIENTE:	**AgriEko Campomarino srl** **Via G. Pastore 1/A - 86039 Termoli (CB)**
LOCALITA':	**Terreni in agro di Campomarino (CB) individuati al N.C.T. al Foglio 45 Part. 30, 31, 35, 38, 39, 40, 41, 120, 122, 123, 124, 125, 126, 130, 135, 166, 168, 171 Foglio 39 Part. 75, 309**
OGGETTO:	**Parco Agrivoltaico per la produzione congiunta di energia elettrica e coltivazione seminativa con immissione su RTN della potenza di picco di 46,75 MWp**

CALCOLO PRODUCIBILITA'

COMM.	SETT.	TIP.	NUM.	DETT.	REV.	
02923	**ELETT.**	**RELAZ.**	**89**	**ESECUTIVO**	**01**	**CM_89**

REV.	DATA	DESCRIZIONE	RED.	VER.	APP.
1	20/12/2023	PRIMA EMISSIONE	AC - SC	EG	GM

PROGETTAZIONE

STUDIOEKÓ

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Proponente: AgriEko Campomarino srl

GRUPPO DI PROGETTAZIONE:

Ing. Gianluca MEDULLI:	progettazione generale, studio impatto ambientale, progettazione elettrica
Ing. Ernesto STORTO:	studio impatto acustico
Dott. agr. Luciano GRILLI:	studi e progettazione agronomica
Dott. Rodolfo CARMAGNOLA:	studi e indagini archeologiche
Dott. geol. Carmine MARINARO:	studi e indagini geologiche e sismiche

Elaborato redatto da:

Ing. Gianluca MEDULLI
Ordine degli Ingegneri CB-A1310
Studio Eko' srl

Version 7.4.4

PVsyst - report

Grid-Connected System

Project: AgriEko Campomarino

Variant: Nuova variante di simulazione

No 3D scene defined, no shadings

System power: 46.76 MWp

Campomarino - Italy

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Project summary

Geographical Site
Nuova Cliternia
Italy

Situation

Latitude	41.88 °N
Longitude	15.07 °E
Altitude	100 m
Time zone	UTC+1

Project settings
Albedo 0.20

Meteo data
Nuova Cliternia
Meteonorm 8.1 (1991-2012), Sat=20% - Sintetico

System summary

Grid-Connected System
No 3D scene defined, no shadings

PV Field Orientation
Orientation
Tracking plane, horizontal N-S axis
Axis azimuth 0 °

Tracking algorithm
Irradiance optimization

Near Shadings
No Shadings

System information

PV Array

Nb. of modules	80616 units
Pnom total	46.76 MWp

Inverters

Nb. of units	10 units
Pnom total	44.00 MWac
Pnom ratio	1.063

User's needs
Unlimited load (grid)

Results summary

Produced Energy
Specific production

Table of contents

General parameters

Grid-Connected System — **No 3D scene defined, no shadings**

PV Field Orientation

Orientation	**Tracking algorithm**	**Trackers configuration**
Tracking plane, horizontal N-S axis	Irradiance optimization	No 3D scene defined
Axis azimuth 0 °		

Models used

Transposition	Perez
Diffuse	Perez, Meteonorm
Circumsolar	separate

Horizon	**Near Shadings**	**User's needs**
Free Horizon	No Shadings	Unlimited load (grid)

PV Array Characteristics

PV module

Manufacturer	Generic
Model	JKM580M-7RL4-V
(Original PVsyst database)	
Unit Nom. Power	580 Wp
Number of PV modules	80616 units
Nominal (STC)	46.76 MWp
Modules	3359 string x 24 In series
At operating cond. (50°C)	
Pmpp	42.66 MWp
U mpp	964 V
I mpp	44241 A

Inverter

Manufacturer	Generic
Model	Sunny Central 4400 UP
(Original PVsyst database)	
Unit Nom. Power	4400 kWac
Number of inverters	10 units
Total power	44000 kWac
Operating voltage	962-1325 V
Pnom ratio (DC:AC)	1.06

Total PV power

Nominal (STC)	46757 kWp
Total	80616 modules
Module area	220410 m²

Total inverter power

Total power	44000 kWac
Number of inverters	10 units
Pnom ratio	1.06

Array losses

Array Soiling Losses
Loss Fraction 2.5 %

Thermal Loss factor
Module temperature according to irradiance
Uc (const) 31.3 W/m²K
Uv (wind) 2.3 W/m²K/m/s

DC wiring losses
Global array res. 0.36 mΩ
Loss Fraction 1.5 % at STC

Serie Diode Loss
Voltage drop 0.7 V
Loss Fraction 0.1 % at STC

LID - Light Induced Degradation
Loss Fraction 0.5 %

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): Fresnel, AR coating, n(glass)=1.526, n(AR)=1.290

0°	30°	50°	60°	70°	75°	80°	85°	90°
1.000	0.999	0.987	0.962	0.892	0.816	0.681	0.440	0.000

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AC wirring losses

Inv. output line up to MV transfo

Inverter voltage	660	Vac tri
Loss Fraction	0.05	% at STC

Inverter: Sunny Central 4400 UP

Wire section (10 Inv.)	Alu 10 x 3 x 4000	mm²
Average wires length	6	m

MV line up to Injection

MV Voltage	36	kV
Wires	Alu 3 x 700	mm²
Length	1000	m
Loss Fraction	0.16	% at STC

AC losses in transformes

MV transfo

Medium voltage	36	kV

Transformer parameters

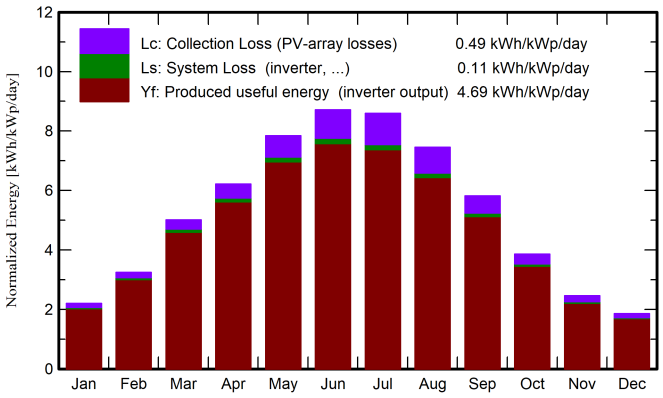
Nominal power at STC	45.93	MVA
Iron Loss (24/24 Connexion)	14.51	kVA
Iron loss fraction	0.03	% at STC
Copper loss	479.53	kVA
Copper loss fraction	1.04	% at STC
Coils equivalent resistance	3 x 0.10	mΩ

Main results

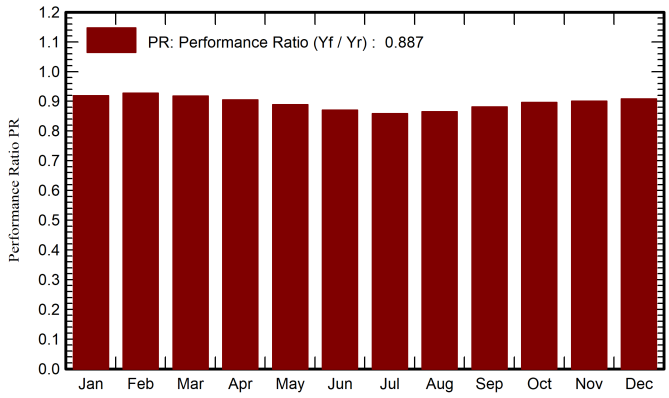
System Production

Produced Energy	79979330 kWh/year	Specific production	1711 kWh/kWp/year
		Perf. Ratio PR	88.68 %

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 kWh	E_Grid kWh	PR ratio
January	49.0	27.06	7.81	68.4	64.8	3006810	2938187	0.919
February	66.8	34.81	8.46	90.9	86.8	4026373	3938657	0.927
March	116.6	55.89	11.29	155.4	149.4	6821036	6668144	0.918
April	141.2	66.21	14.19	186.4	179.6	8070987	7882773	0.905
May	181.6	85.06	19.52	243.0	234.6	10338437	10100574	0.889
June	196.0	82.04	24.44	261.4	252.7	10898213	10645745	0.871
July	198.5	78.28	27.27	266.5	257.6	10950951	10697391	0.859
August	173.7	81.44	26.97	231.0	223.0	9549853	9338125	0.865
September	125.5	58.37	21.50	174.6	168.3	7359652	7196863	0.881
October	86.7	43.35	17.66	119.7	114.8	5125953	5014261	0.896
November	52.2	26.56	12.62	73.8	70.1	3179714	3107296	0.901
December	42.2	25.03	8.98	57.7	54.4	2508819	2451314	0.908
Year	1430.0	664.10	16.78	1928.8	1856.0	81836798	79979330	0.887

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

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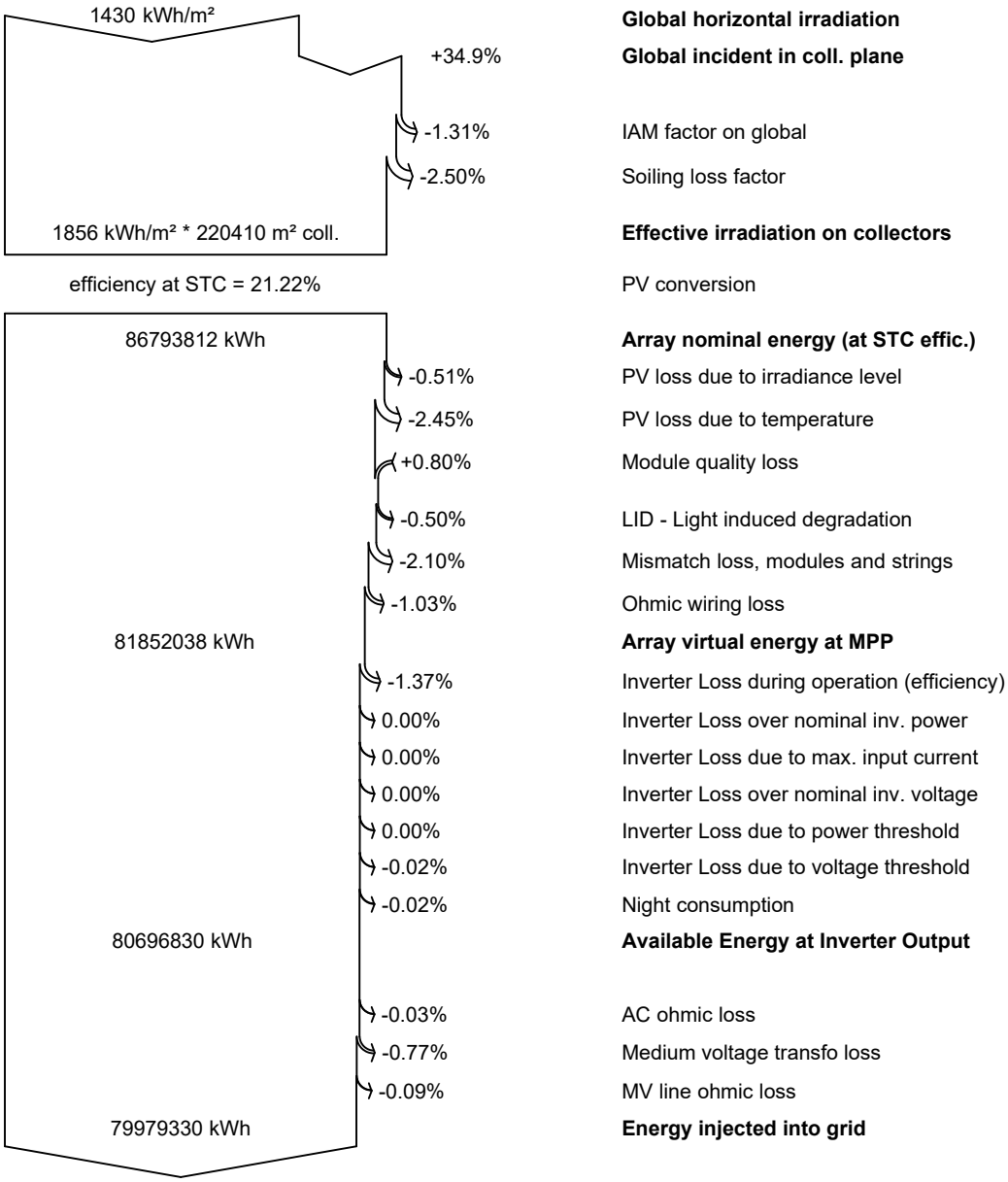
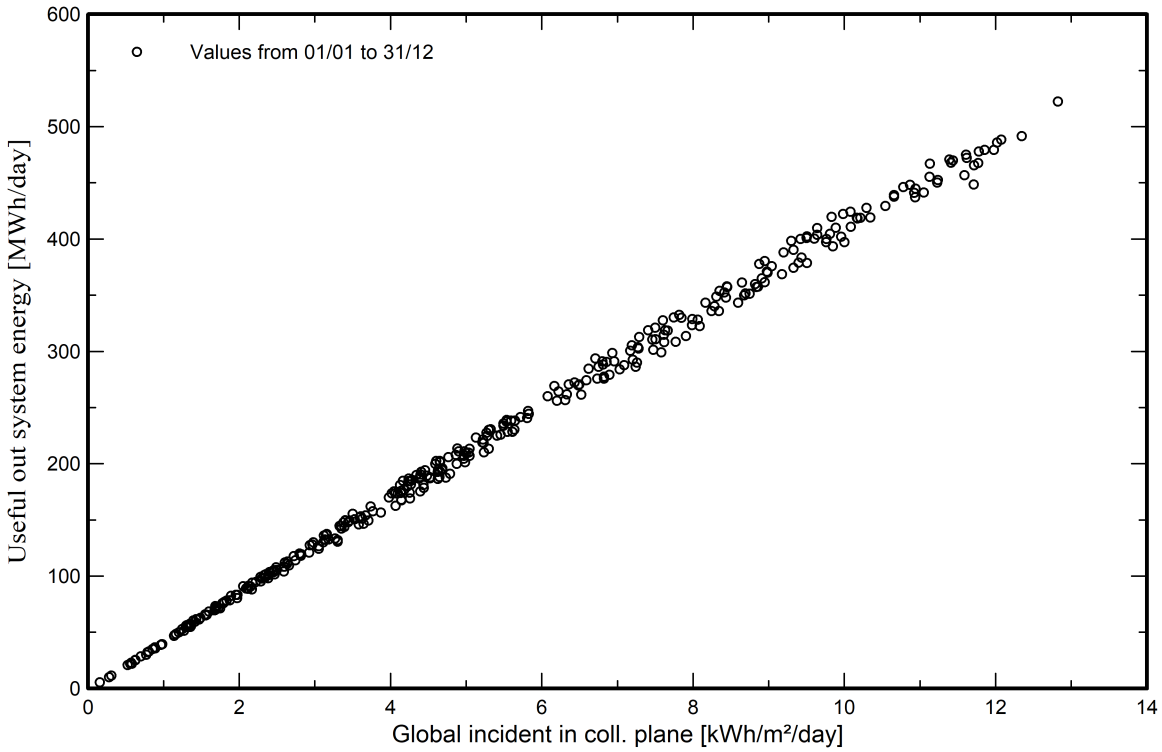
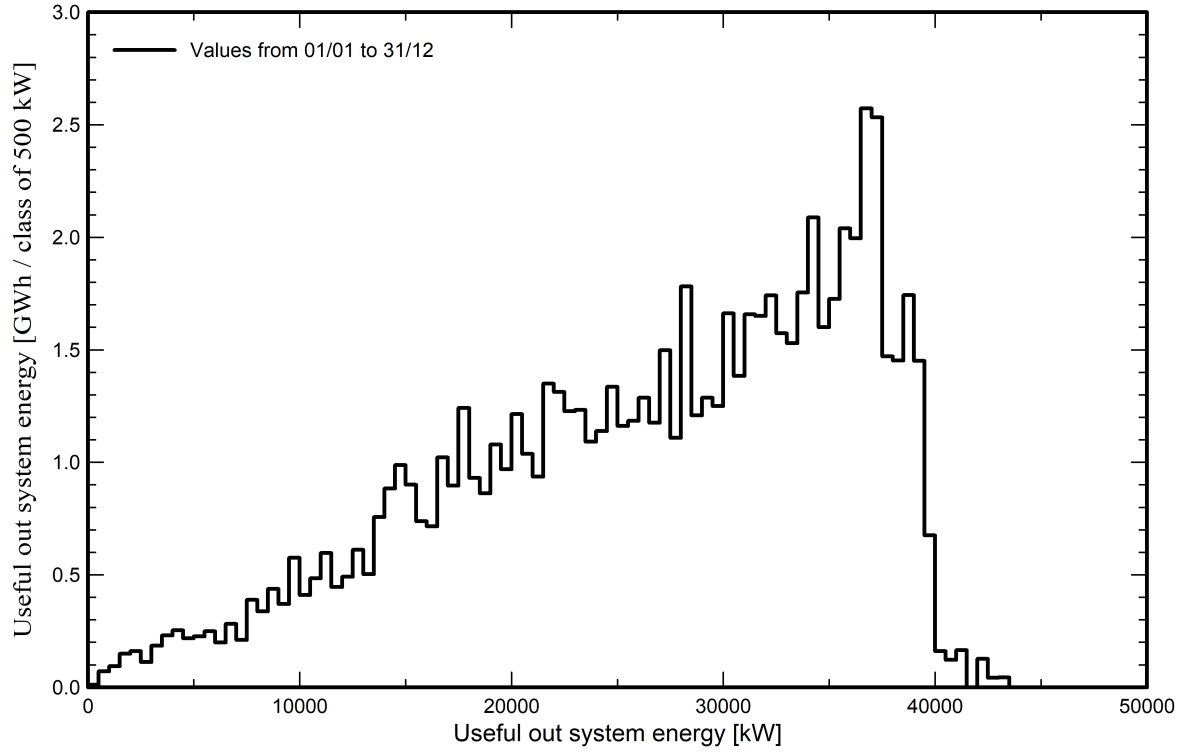
Loss diagram



Predef. graphs





Single-line diagram

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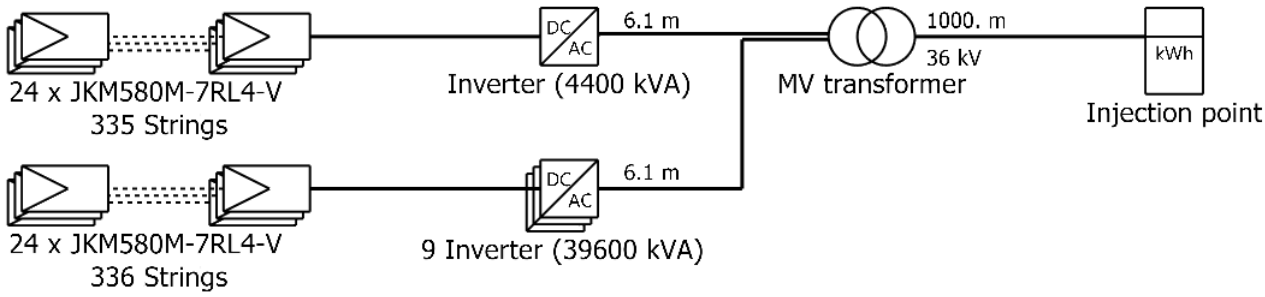

PV module	JKM580M-7RL4-V
Inverter	Sunny Central 4400 UP
String	24 x JKM580M-7RL4-V

	AgriEko Campomarino	
	VC0 : Nuova variante di simulazione	06/12/23