ORTUS Italy

Progetto: # IMPIANTO AGRIVOLTAICO E RELATIVE OPERE DI CONNESSIONE

GUIDO CUZZOLIN
23/06/2026 17:33:10 UTC+0200
Signed with NamirialSign

STMG: Codice Pratica 202400840 - TERNA s.p.a.

Localizzazione: Via Ro snc, Ferrara (FE)

Firma Elaborato:

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DOTT. ING. CIS GIOVANNI
Sez. A Settori:
a) civile e ambientale
b) industriale
c) dell'informazione
n.° A 28287

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Titolo elaborato:

Simulazione PVSYST

Codice Elaborato:	Formato:	Scala:
VIA-02_Rel_03_PVSYST_00	A4	na

Rev.	Data	Descrizione	Redige	Verifica	Approva
00	05/26	Prima emissione	S.R.	R.C.	G.C.
01					
02					
03					
04					

Version 7.2.8

PVsyst - Simulation report

Grid-Connected System

Project: Copparo 4

Variant: Nuova variante di simulazione

Tracking system with backtracking

System power: 25.66 MWp

Motta del Turco - Italy

Author

PVsyst V7.2.8
VC0, Simulation date:
17/12/25 16:48
with v7.2.8

Project summary

Geographical Site
Motta del Turco
Italy

Situation

Latitude	44.89 °N
Longitude	11.73 °E
Altitude	8 m
Time zone	UTC+1

Project settings

Albedo	0.20

Meteo data
Motta del Turco
Meteonorm 8.0 (1991-2012), Sat=100% - Sintetico

System summary

Grid-Connected System

Tracking system with backtracking

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

Near Shadings
Linear shadings

User's needs
Unlimited load (grid)

System information

PV Array

Nb. of modules	35644 units
Pnom total	25.66 MWp

Inverters

Nb. of units	75 units
Pnom total	22.50 MWac
Grid power limit	22.50 MWac
Grid lim. Pnom ratio	1.141

Results summary

Produced Energy	39478 MWh/year	Specific production	1538 kWh/kWp/year	Perf. Ratio PR	90.66 %

Table of contents

General parameters

Grid-Connected System

Tracking system with backtracking

PV Field Orientation

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

Backtracking strategy
Nb. of trackers 1407 units

Sizes
Tracker Spacing 5.50 m
Collector width 2.38 m
Ground Cov. Ratio (GCR) 43.3 %
Phi min / max. -/+ 60.0 °

Backtracking limit angle
Phi limits +/- 64.1 °

Models used
Transposition Perez
Diffuse Perez, Meteonorm
Circumsolar separate

Horizon
Free Horizon

Near Shadings
Linear shadings

User's needs
Unlimited load (grid)

Bifacial system
Model 2D Calculation
unlimited trackers

Bifacial model geometry

Tracker Spacing	5.50 m
Tracker width	2.38 m
GCR	43.3 %
Axis height above ground	3.10 m

Bifacial model definitions

Ground albedo	0.20
Bifaciality factor	80 %
Rear shading factor	5.0 %
Rear mismatch loss	10.0 %
Shed transparent fraction	0.0 %

Grid power limitation
Active Power 22.50 MWac
Pnom ratio 1.141

PV Array Characteristics

PV module

Manufacturer	Trina Solar
Model	TSM-720NEG21C.20
(Custom parameters definition)	
Unit Nom. Power	720 Wp
Number of PV modules	35644 units
Nominal (STC)	25.66 MWp
Modules	1273 Strings x 28 In series
At operating cond. (50°C)	
Pmpp	23.84 MWp
U mpp	1060 V
I mpp	22489 A

Inverter

Manufacturer	Huawei Technologies
Model	SUN2000-330KTL-H1-Preliminary V0.1
(Custom parameters definition)	
Unit Nom. Power	300 kWac
Number of inverters	75 units
Total power	22500 kWac
Operating voltage	500-1500 V
Max. power (=>30°C)	330 kWac
Pnom ratio (DC:AC)	1.14

Total PV power

Nominal (STC)	25664 kWp
Total	35644 modules
Module area	110723 m²

Total inverter power

Total power	22500 kWac
Nb. of inverters	75 units
Pnom ratio	1.14

Array losses

Array Soiling Losses
Loss Fraction 1.0 %

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. 0.61 mΩ
Loss Fraction 1.2 % at STC

LID - Light Induced Degradation
Loss Fraction 2.0 %

Module Quality Loss
Loss Fraction -0.3 %

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°	30°	50°	60°	70°	75°	80°	85°	90°
1.000	1.000	0.999	0.994	0.969	0.928	0.829	0.588	0.000

System losses

Auxiliaries loss
Proportionnal to Power 5.0 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 1.03 % at STC
Inverter: SUN2000-330KTL-H1-Preliminary V0.1
Wire section (75 Inv.) Alu 75 x 3 x 240 mm²
Average wires length 150 m

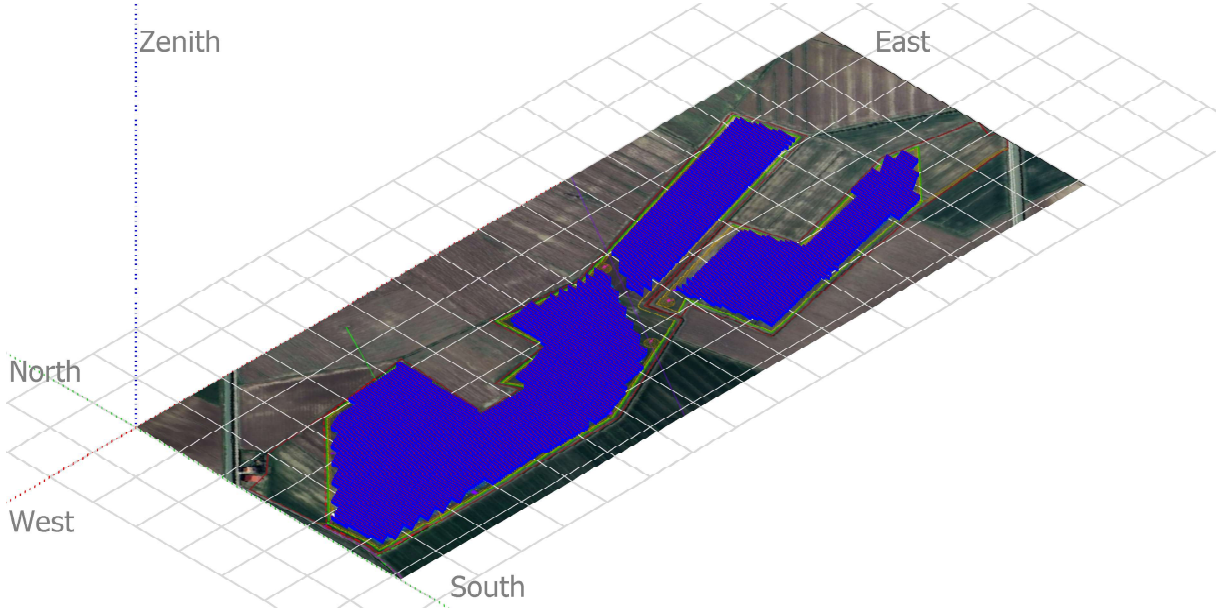
MV line up to Injection
MV Voltage 36 kV
Average each inverter
Wires Alu 3 x 185 mm²
Length 400 m
Loss Fraction 0.02 % at STC

AC losses in transformers

MV transfo
Grid voltage 36 kV
Operating losses at STC
Nominal power at STC 25210 kVA
Iron loss (24/24 Connexion) 3.15 kW/Inv.
Loss Fraction 0.10 % at STC
Coils equivalent resistance 3 x 2.03 mΩ/inv.
Loss Fraction 1.00 % at STC

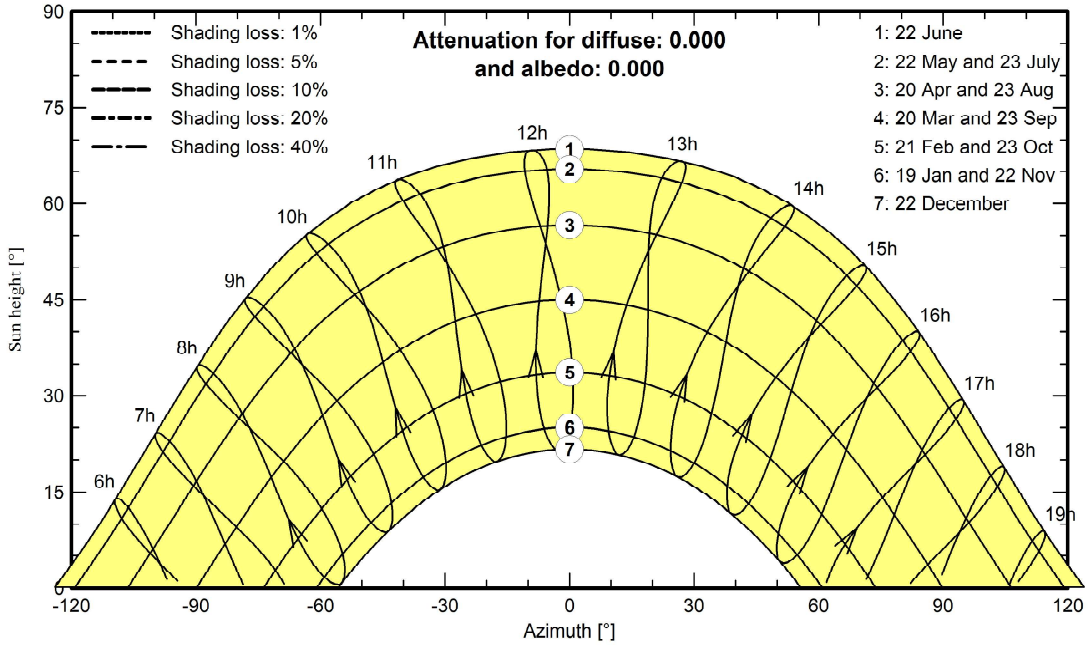
Near shadings parameter

Perspective of the PV-field and surrounding shading scene



Iso-shadings diagram

Copparo 4 - Legal Time

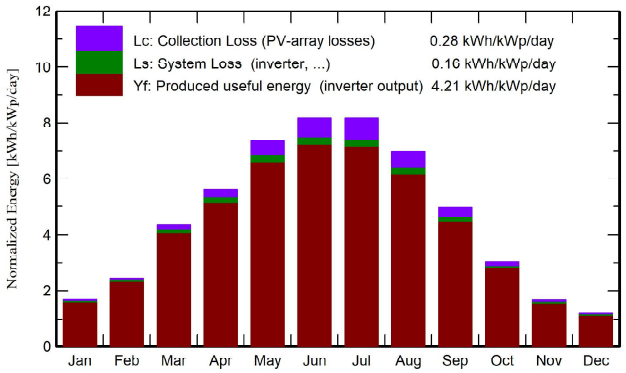


Main results

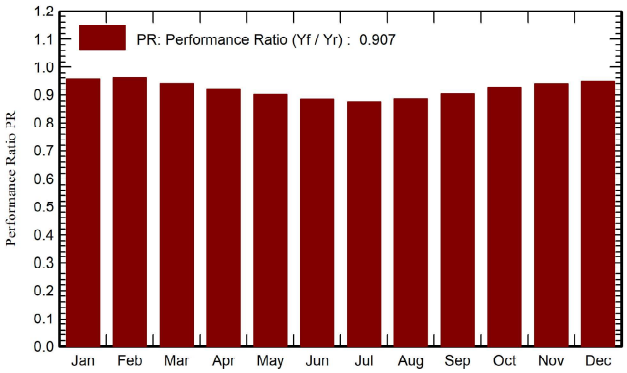
System Production

Produced Energy	39478 MWh/year	Specific production	1538 kWh/kWp/year
		Performance Ratio PR	90.66 %

Normalized productions (per installed kWp)



Performance Ratio PR



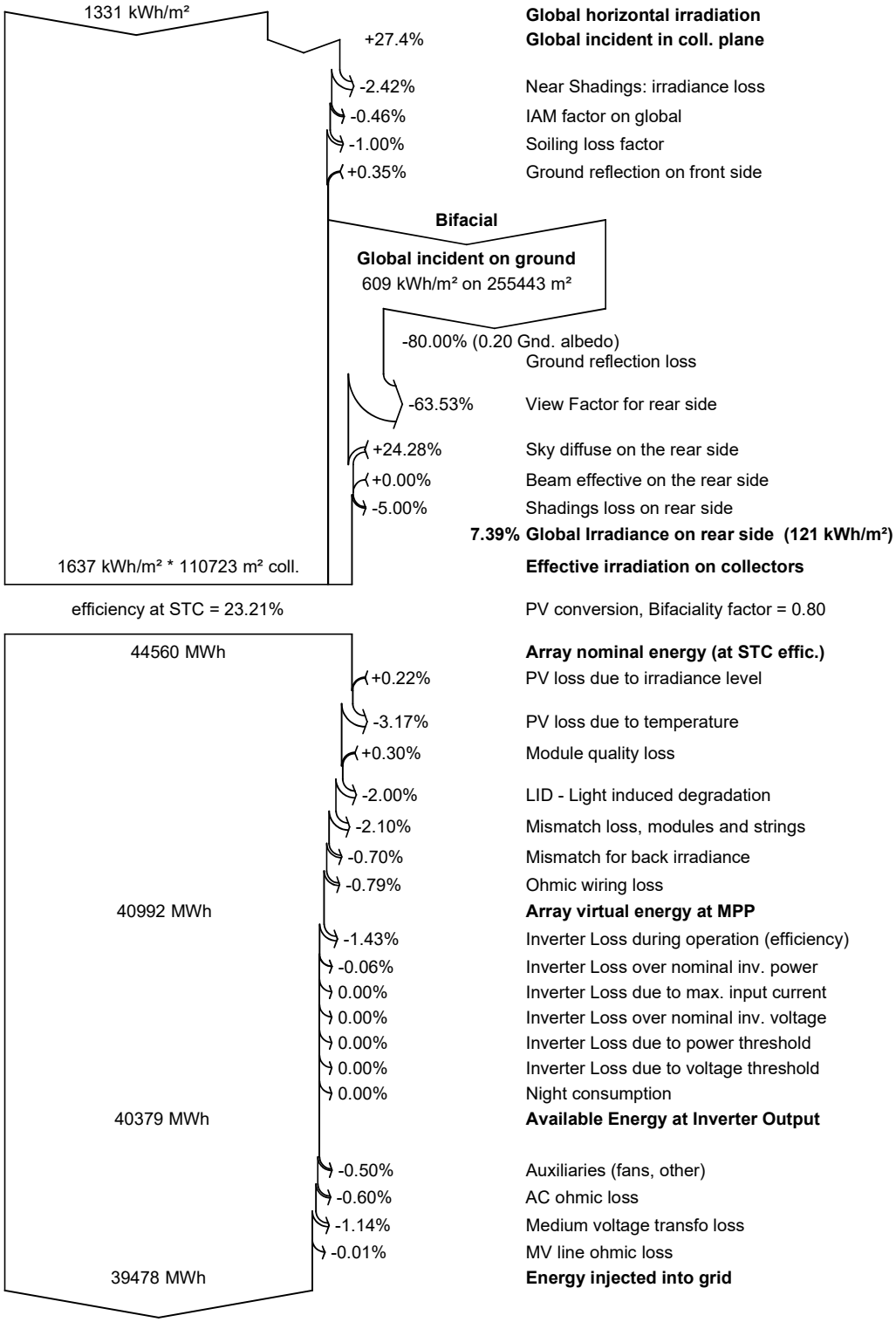
Balances and main results

	GlobHor kWh/m²	DiffHor kWh/m²	T_Amb °C	GlobInc kWh/m²	GlobEff kWh/m²	EArray MWh	E_Grid MWh	PR ratio
January	40.1	20.09	2.93	52.1	49.8	1329	1278	0.955
February	54.3	30.83	4.91	67.9	65.0	1734	1673	0.960
March	105.8	53.52	9.97	134.6	129.6	3362	3247	0.940
April	134.4	66.94	14.22	169.0	163.0	4144	3998	0.922
May	177.6	81.54	19.15	227.5	220.0	5459	5262	0.901
June	192.1	79.94	23.43	245.2	237.7	5787	5573	0.886
July	195.8	80.39	25.83	253.4	245.7	5925	5706	0.877
August	169.0	77.40	25.27	216.5	209.4	5111	4927	0.887
September	116.1	52.10	20.00	148.8	143.6	3579	3450	0.904
October	75.3	42.76	15.45	94.1	90.2	2322	2240	0.928
November	40.3	23.60	9.50	50.2	47.8	1260	1209	0.940
December	30.5	19.54	4.10	37.6	35.6	957	915	0.948
Year	1331.4	628.65	14.62	1696.8	1637.3	40969	39478	0.907

Legends

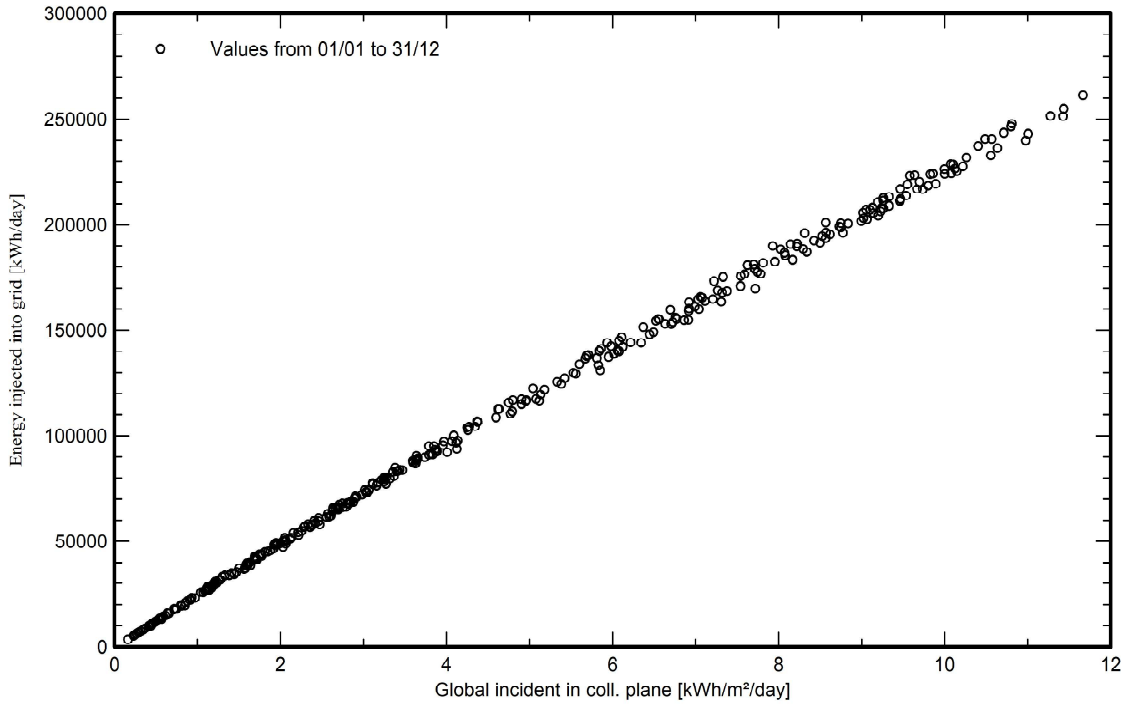
GlobHor	Global horizontal irradiation	EArray	Effective energy at the output of the array
DiffHor	Horizontal diffuse irradiation	E_Grid	Energy injected into grid
T_Amb	Ambient Temperature	PR	Performance Ratio
GlobInc	Global incident in coll. plane		
GlobEff	Effective Global, corr. for IAM and shadings		

Loss diagram



Special graphs

Diagramma giornaliero entrata/uscita



Distribuzione potenza in uscita sistema