Regione Puglia
Provincia di Brindisi
Comune di Brindisi

PROGETTO DEFINITIVO: IMPIANTO FV-PINICELLE

OGGETTO:

PROGETTAZIONE E REALIZZAZIONE DI UN IMPIANTO AGRO- FOTOVOLTAICO DELLA POTENZA DI 26,000 MW IN AC E 29,328 MW IN DC E DI TUTTE LE OPERE CONNESSE ED INFRASTRUTTURE

PROCEDURA AUTORIZZATIVA:

Provvedimento Unico Ambientale (PUA) ai sensi dell'art.27 del D.Lgs.152/2006

IL COMMITTENTE
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COD. ELAB:	ELABORATO:	
A30	CALCOLO DELLA PRODUCIBILITÀ PVsyst	

REVISIONE:		CODICE DI RINTRACCIABILITA':	DATA:
REV.02		201900072	20/05/2022

TIMBRO ENTE AUTORIZZANTE

Version 7.2.14

PVsyst - Simulation report

Grid-Connected System

Project: Cluster Brindisi Pinicelle Completo

Variant: Nuova variante di simulazione

Unlimited Trackers with backtracking

System power: 27.40 MWp

Puglia - Italia

Author

Energie rinnovabili srl (Italy)

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Project summary

Geographical Site
Puglia
Italia

Situation

Latitude	40.60 °N
Longitude	17.91 °E
Altitude	39 m
Time zone	UTC+1

Project settings
Albedo 0.30

Meteo data
Puglia
SolarGIS Monthly aver. , period not spec. - Sintetico

System summary

Grid-Connected System
Unlimited Trackers with backtracking

PV Field Orientation
Orientation
Tracking horizontal axis

Tracking algorithm
Irradiance optimization
Backtracking activated

Near Shadings
No Shadings

System information

PV Array		Inverters	
Nb. of modules	49374 units	Nb. of units	130 units
Pnom total	27.40 MWp	Pnom total	26.00 MWac
		Pnom ratio	1.054

User's needs
Unlimited load (grid)

Results summary

Produced Energy	50 GWh/year	Specific production	1838 kWh/kWp/year	Perf. Ratio PR	88.21 %

Table of contents

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General parameters

Grid-Connected System — **Unlimited Trackers with backtracking**

PV Field Orientation

Orientation
Tracking horizontal axis

Tracking algorithm
Irradiance optimization
Backtracking activated

Backtracking strategy

Nb. of trackers	10	units
Unlimited trackers		

Sizes

Tracker Spacing	9.00	m
Collector width	4.80	m
Ground Cov. Ratio (GCR)	53.3	%
Left inactive band	0.02	m
Right inactive band	0.02	m
Phi min / max.	-/+ 60.0	°

Backtracking limit angle

Phi limits	+/- 57.3	°

Models used

Transposition	Perez
Diffuse	Perez, Meteonorm
Circumsolar	separate

Horizon
Free Horizon

Near Shadings
No Shadings

User's needs
Unlimited load (grid)

Bifacial system

Model: 2D Calculation unlimited trackers

Bifacial model geometry

Tracker Spacing	9.00	m
Tracker width	4.84	m
GCR	53.8	%
Axis height above ground	2.10	m

Bifacial model definitions

Ground albedo	0.30	
Bifaciality factor	80	%
Rear shading factor	5.0	%
Rear mismatch loss	10.0	%
Shed transparent fraction	0.0	%

PV Array Characteristics

PV module

Manufacturer	Trina Solar
Model	TSM-DE19-555Wp
(Custom parameters definition)	
Unit Nom. Power	555 Wp
Number of PV modules	49374 units
Nominal (STC)	27.40 MWp
Modules	1899 Strings x 26 In series
At operating cond. (50°C)	
Pmpp	25.07 MWp
U mpp	749 V
I mpp	33471 A

Inverter

Manufacturer	Huawei Technologies
Model	SUN2000-215KTL-H3
(Custom parameters definition)	
Unit Nom. Power	200 kWac
Number of inverters	130 units
Total power	26000 kWac
Operating voltage	500-1500 V
Max. power (=>33°C)	215 kWac
Pnom ratio (DC:AC)	1.05

Total PV power

Nominal (STC)	27403	kWp
Total	49374	modules
Module area	129008	m²

Total inverter power

Total power	26000	kWac
Number of inverters	130	units
Pnom ratio	1.05	

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Array losses

Thermal Loss factor
Module temperature according to irradiance
Uc (const) 20.0 W/m²K
Uv (wind) 0.0 W/m²K/m/s

DC wiring losses
Global array res. 0.37 mΩ
Loss Fraction 1.5 % at STC

Module Quality Loss
Loss Fraction -0.4 %

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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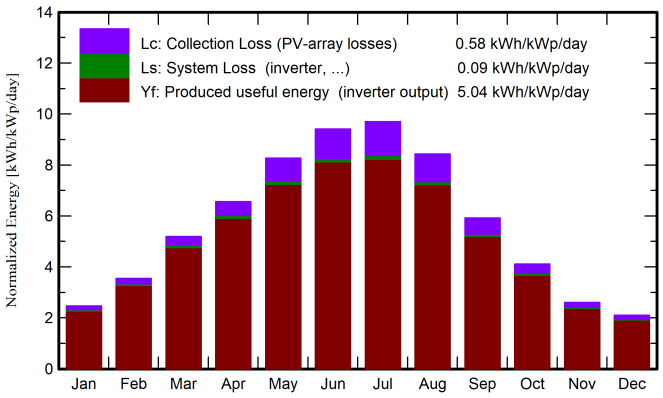
Main results

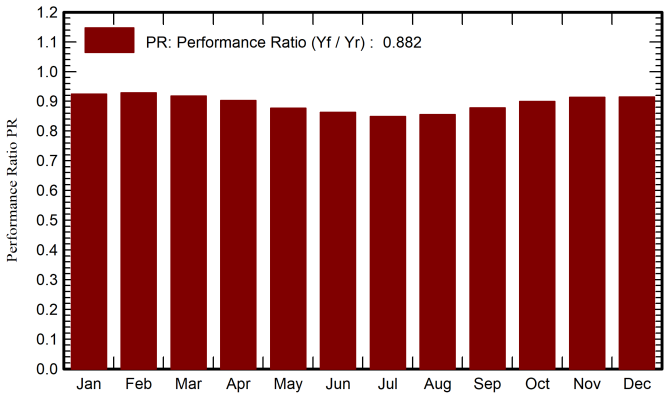
System Production

Produced Energy	50 GWh/year	Specific production	1838 kWh/kWp/year
		Performance Ratio PR	88.21 %

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	60.3	28.20	10.30	76.7	72.7	1.977	1.942	0.924
February	77.7	34.70	10.30	99.2	94.4	2.567	2.523	0.928
March	128.0	51.80	12.00	161.1	155.6	4.123	4.051	0.918
April	156.8	64.80	14.30	197.0	190.5	4.961	4.873	0.903
May	203.2	74.40	18.40	256.2	248.7	6.269	6.157	0.877
June	221.9	72.90	22.50	282.5	274.5	6.802	6.681	0.863
July	233.4	68.20	25.10	300.6	292.4	7.123	6.996	0.849
August	203.0	64.80	25.60	261.6	254.2	6.245	6.135	0.856
September	141.5	57.60	22.20	177.8	171.8	4.352	4.276	0.878
October	100.9	45.60	18.70	127.3	122.0	3.192	3.136	0.899
November	62.7	31.50	14.80	78.2	73.8	1.992	1.958	0.914
December	51.2	25.10	11.50	65.2	61.0	1.664	1.633	0.914
Year	1640.6	619.60	17.18	2083.4	2011.8	51.266	50.360	0.882

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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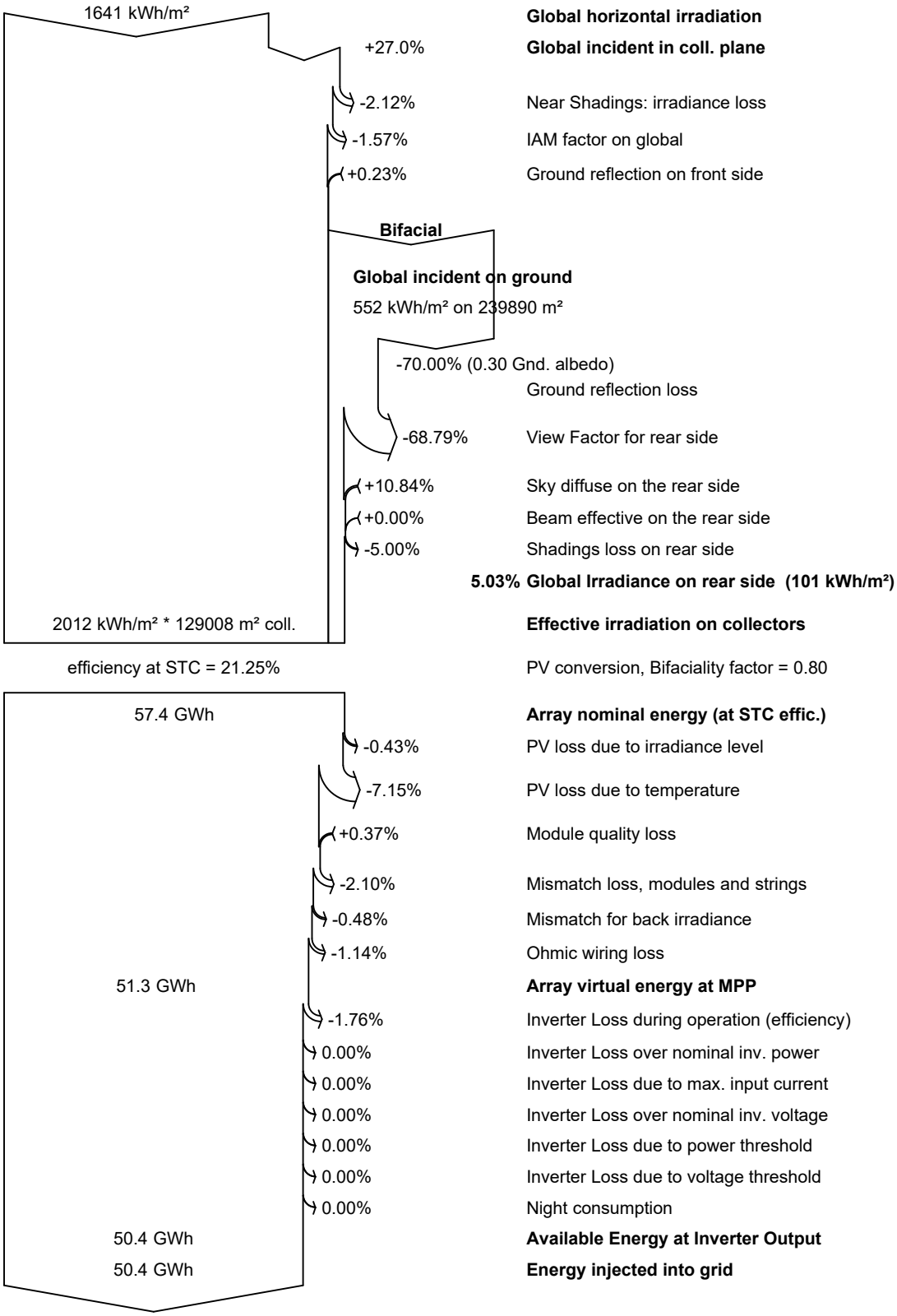
Loss diagram



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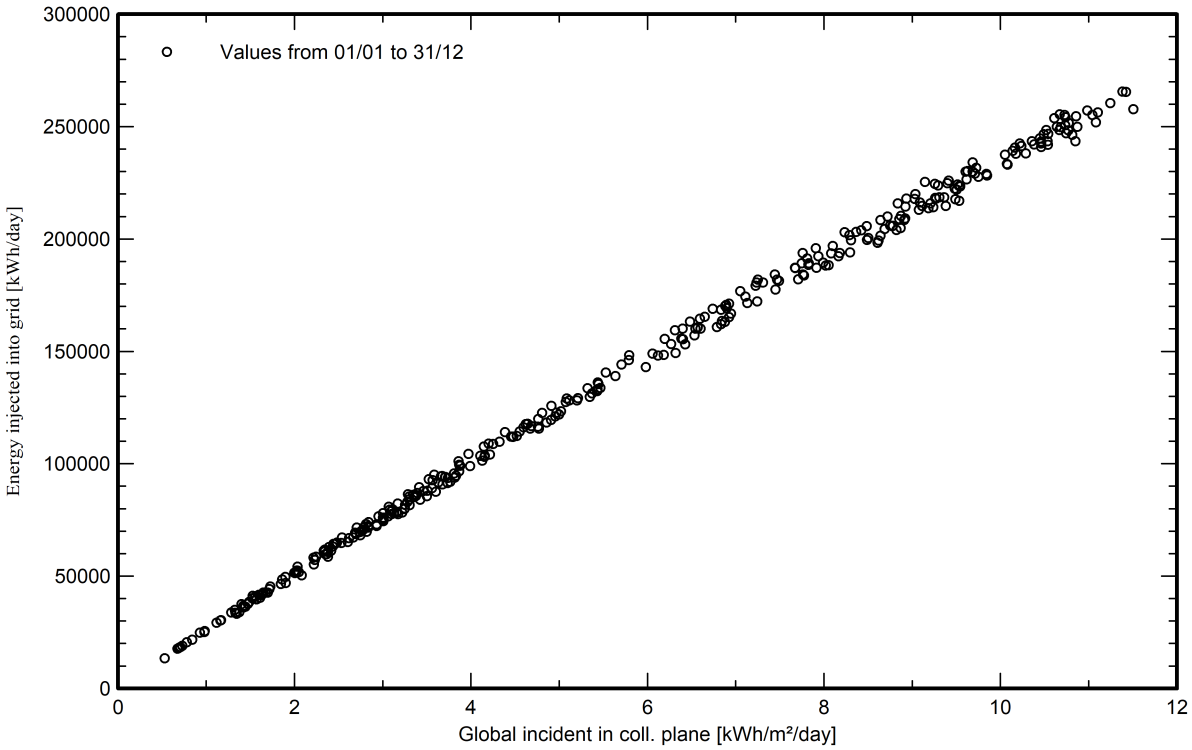
Special graphs

Diagramma giornaliero entrata/uscita



Distribuzione potenza in uscita sistema