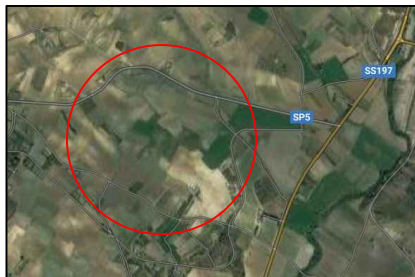


00	Febbraio 2024	Elaborato per verifica di assoggettabilità alla V.I.A.	BD_FS	AV_SA	AV_SA
Rev.	Data	Descrizione	Eseg.	Contr.	Appr.



**IMPIANTO AGRIVOLTAICO IN AREA AGRICOLA
COMUNI DI SANLURI E FURTEI
PROVINCIA DEL SUD SARDEGNA**

Oggetto **VERIFICA DI ASSOGGETTABILITÀ ALLA V.I.A. REGIONALE**
ai sensi del D.Lgs. 152/06 e s.m.i., e Delib.G.R n.11/75 del 24.03.2021

Elaborato
RELAZIONE TECNICA
Impianto di Rete per la Connessione

Cod. elab.
AV.SA_VA_EL.03

Proponente

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Scala

Data

Febbraio 2024

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Dott. Ing. FABRIZIO SERRENTI
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A4	AV.SA_VA_EL.03	AV.SA_VA_EL.03	2024/1003
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PVsyst - Simulation report

Grid-Connected System

Project: AV Sanluri

Variant: Variante Sanluri 2

No 3D scene defined, no shadings

System power: 17.08 MWp

Sanluri - Italy

Author

TEAL CHANGE SRL (Italy)



Project: AV Sanluri

Variant: Variante Sanluri 2

PVsyst V7.4.5

VC2, Simulation date:
02/01/24 18:30
with v7.4.5

TEAL CHANGE SRL (Italy)

Project summary

Geographical Site

Sanluri

Italy

Situation

Latitude 39.56 °N

Longitude 8.92 °E

Altitude 121 m

Time zone UTC+1

Project settings

Albedo 0.20

Meteo data

Sanluri

Meteonorm 8.1 (1991-2013), Sat=91% - 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

Astronomic calculation

Near Shadings

No Shadings

System information

PV Array

Nb. of modules

28000 units

Pnom total

17.08 MWp

Inverters

Nb. of units

64 units

Pnom total

16.00 MWac

Pnom ratio

1.067

User's needs

Unlimited load (grid)

Results summary

Produced Energy 33867980 kWh/year Specific production 1983 kWh/kWp/year Perf. Ratio PR 88.78 %

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Loss diagram	5
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Single-line diagram	7



General parameters

Grid-Connected System

No 3D scene defined, no shadings

PV Field Orientation

Orientation

Tracking plane, horizontal N-S axis

Axis azimuth 0 °

Models used

Transposition Perez

Diffuse Perez, Meteonorm

Circumsolar separate

Tracking algorithm

Astronomic calculation

Trackers configuration

No 3D scene defined

Horizon

Free Horizon

Near Shadings

No Shadings

User's needs

Unlimited load (grid)

PV Array Characteristics

PV module

Manufacturer

Jinkosolar

Model

JKM-610N-66HL4M-BDV

(Original PVsyst database)

Unit Nom. Power

610 Wp

Number of PV modules

28000 units

Nominal (STC)

17.08 MWp

Modules

1000 string x 28 In series

At operating cond. (50°C)

Pmpp

15.84 MWp

U mpp

1056 V

I mpp

14992 A

Total PV power

Nominal (STC)

17080 kWp

Total

28000 modules

Module area

75570 m²

Inverter

Manufacturer

TBea

Model

TS250KTL-HV

(Custom parameters definition)

Unit Nom. Power

250 kWac

Number of inverters

64 units

Total power

16000 kWac

Operating voltage

550-1300 V

Pnom ratio (DC:AC)

1.07

Total inverter power

Total power

16000 kWac

Number of inverters

64 units

Pnom ratio

1.07

Array losses

Thermal Loss factor

Module temperature according to irradiance

Uc (const) 20.0 W/m²KUv (wind) 0.0 W/m²K/m/s

DC wiring losses

Global array res.

1.2 mΩ

Loss Fraction

1.5 % at STC

Module Quality Loss

Loss Fraction

-0.8 %

Module mismatch losses

Loss Fraction 2.0 % at MPP

Strings Mismatch loss

Loss Fraction 0.2 %

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



Main results

System Production

Produced Energy 33867980 kWh/year

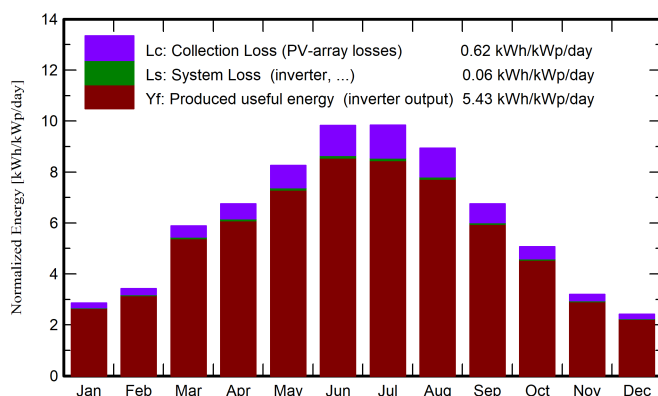
Specific production

1983 kWh/kWp/year

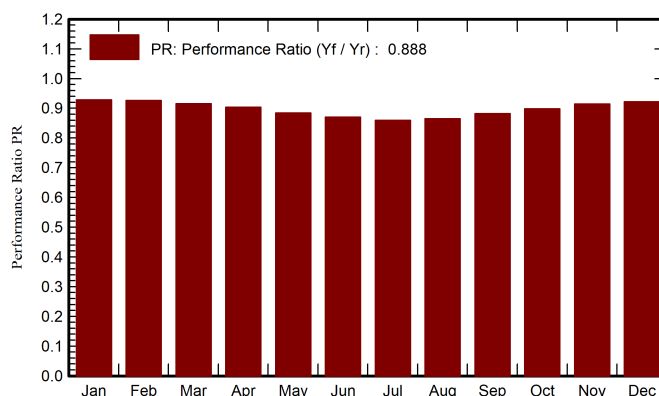
Perf. Ratio PR

88.78 %

Normalized productions (per installed kWp)



Performance Ratio PR



Balances and main results

	GlobHor	DiffHor	T_Amb	GlobInc	GlobEff	EArray	E_Grid	PR
	kWh/m²	kWh/m²	°C	kWh/m²	kWh/m²	kWh	kWh	ratio
January	62.6	32.88	9.31	88.6	86.4	1422263	1405648	0.929
February	72.7	37.04	9.53	95.7	94.0	1531564	1513526	0.926
March	131.4	54.53	12.23	182.6	180.6	2886884	2855094	0.916
April	152.5	73.24	14.81	202.6	200.6	3163062	3127147	0.904
May	191.5	72.93	18.89	256.2	254.3	3913143	3868310	0.884
June	221.3	79.55	23.52	295.0	293.2	4434584	4383191	0.870
July	226.0	74.93	26.83	305.2	303.4	4530895	4480093	0.859
August	199.0	72.41	26.78	277.2	275.4	4141445	4096265	0.865
September	145.1	54.38	22.54	202.7	200.9	3088081	3053709	0.882
October	109.8	42.70	19.49	157.2	155.2	2438349	2411644	0.898
November	67.5	30.63	14.21	95.8	93.8	1513724	1495789	0.914
December	53.5	28.13	10.72	74.8	72.6	1192667	1177565	0.922
Year	1632.9	653.35	17.45	2233.4	2210.3	34256660	33867980	0.888

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

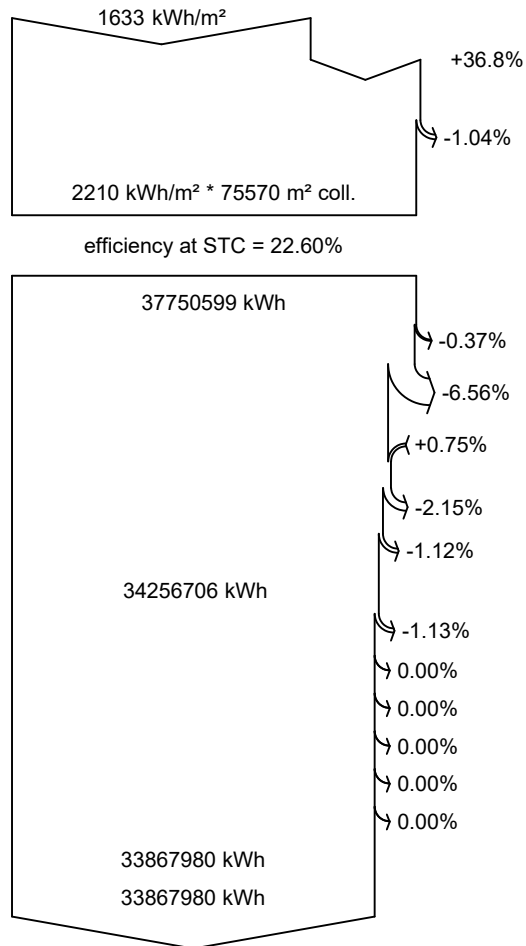
EArray Effective energy at the output of the array

E_Grid Energy injected into grid

PR Performance Ratio



Loss diagram



Global horizontal irradiation

Global incident in coll. plane

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

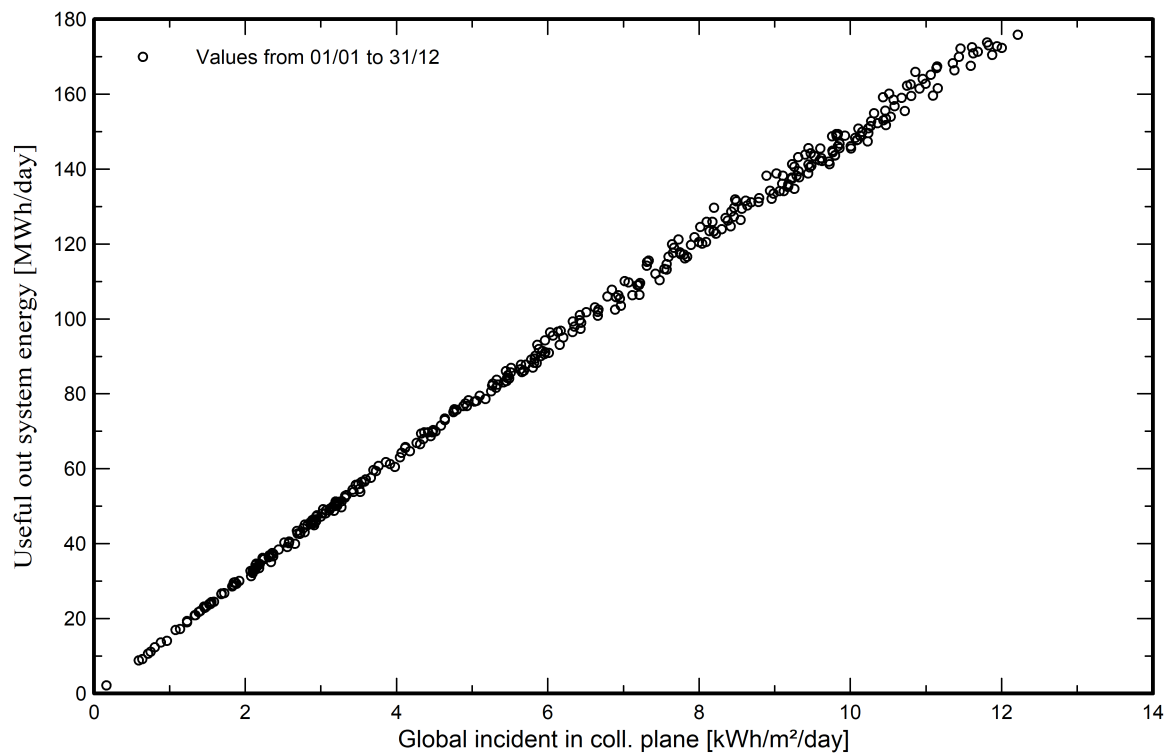
Available Energy at Inverter Output

Energy injected into grid

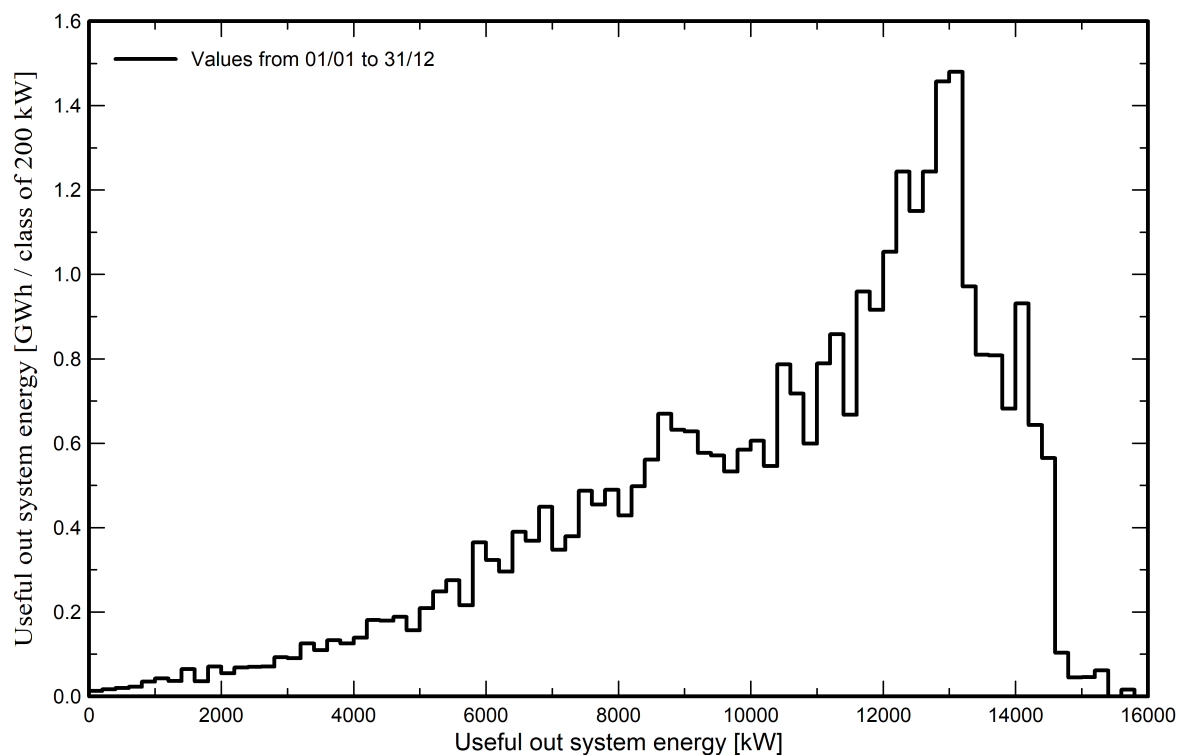


Predef. graphs

Diagramma giornaliero entrata/uscita



Distribuzione potenza in uscita sistema

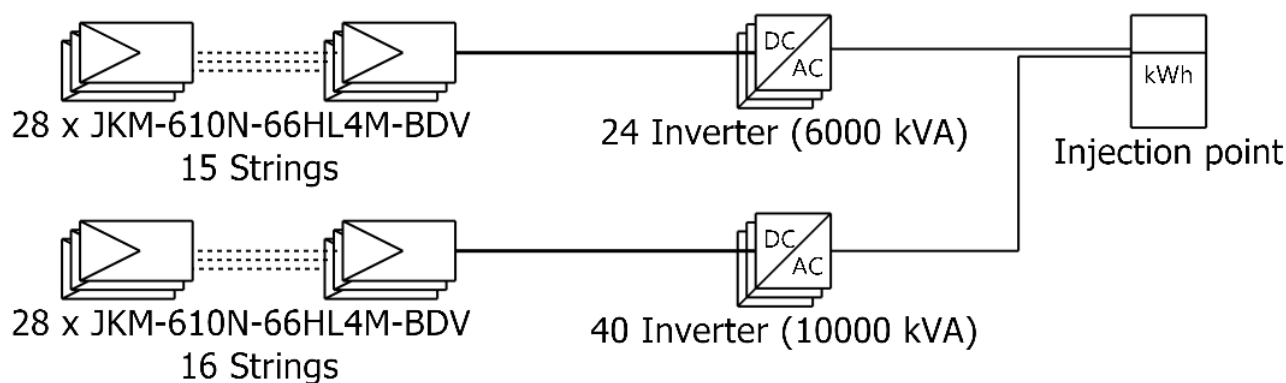




PVsyst V7.4.5

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Single-line diagram



PV module	JKM-610N-66HL4M-BDV
Inverter	TS250KTL-HV
String	28 x JKM-610N-66HL4M-BDV

AV Sanluri

TEAL CHANGE SRL (Italy)

VC2 : Variante Sanluri 2

02/01/24