



COMUNE DI
VILLACIDRO



COMUNE DI
SAN GAVINO MONREALE



PROVINCIA DEL
MEDIO CAMPIDANO



MINISTERO DELLA
TRANSIZIONE ECOLOGICA



REGIONE AUTONOMA
DELLA SARDEGNA



COMUNE DI
SANLURI



COMUNE DI
SERRAMANNA

PROGETTO PER LA REALIZZAZIONE DELL'IMPIANTO AGRIVOLTAICO "VILLACIDRO 3" E OPERE CONNESSE

COMUNI DI VILLACIDRO E SAN GAVINO MONREALE (VS)

POTENZA MASSIMA DI IMMISSIONE IN RETE 50.000 kW
POTENZA MASSIMA INSTALLATA PANNELLI 51.300 kWp

A

PROGETTO IMPIANTO AGRIVOLTAICO

DATA
21/02/2022

REVISIONE
1

SCALA
1:1

CODICE

F.R14

TITOLO

CALCOLO PRODUCIBILITA'

IL PROPONENTE

GREEN ENERGY SARDEGNA 2 S.r.l.
Piazza del Grano, 3
39100 Bolzano (BZ)

IL PROGETTISTA

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GREENENERGYSARDEGNA2

GREEN ENERGY SARDEGNA 2 S.r.l. Piazza del Grano, 3 39100 Bolzano (BZ)



PVsyst - Simulation report

Grid-Connected System

Project: Villacidro 3_rev2

Variant: Pitch 09 m; 51,3 MW

Trackers single array

System power: 51.30 MWp

Villacidro 3 - Italy

Autore

Mare srls (Italy)



**PVsyst V7.2.11**

VC4, Simulation date:
01/02/22 10:37
with v7.2.11

Mare srls (Italy)**Project summary****Geographical Site**

Villacidro 3
Italy

Situation

Latitude 39.47 °N
Longitude 8.82 °E
Altitude 81 m
Time zone UTC+1

Project settings

Albedo 0.20

Meteo data

Villacidro 3
Meteonorm 8.0 (1991-2013), Sat=68% - Sintetico

System summary**Grid-Connected System****PV Field Orientation**

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

Trackers single array**Near Shadings**

Linear shadings

User's needs

Unlimited load (grid)

System information**PV Array**

Nb. of modules 73814 units
Pnom total 51.30 MWp

Inverters

Nb. of units 20 units
Pnom total 50.00 MWac
Pnom ratio 1.026

Results summary

Produced Energy 90 GWh/year Specific production 1756 kWh/kWp/year Perf. Ratio PR 78.40 %

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Mare srls (Italy)**General parameters****Grid-Connected System****PV Field Orientation****Orientation**

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

Horizon

Free Horizon

Trackers single array**Trackers configuration**

Nb. of trackers 66 units
Single array

Sizes

Tracker Spacing 9.00 m
Collector width 5.01 m
Ground Cov. Ratio (GCR) 55.7 %
Phi min / max. +/- 60.0 °

Shading limit angles

Phi limits +/- 56.0 °

Near Shadings

Linear shadings

Models used

Transposition Perez
Diffuse Perez, Meteonorm
Circumsolar separate

User's needs

Unlimited load (grid)

PV Array Characteristics**PV module**

Manufacturer Jolywood
Model JW - HD132N (datasheet)
(Custom parameters definition)

Unit Nom. Power 695 Wp
Number of PV modules 73814 units
Nominal (STC) 51.30 MWp
Modules 2839 Strings x 26 In series

At operating cond. (50°C)

Pmpp 47.86 MWp
U mpp 942 V
I mpp 50820 A

Total PV power

Nominal (STC) 51301 kWp
Total 73814 modules
Module area 229292 m²

Inverter

Manufacturer SMA
Model Sunny Central 2500-EV
(Original PVsyst database)

Unit Nom. Power 2500 kWac
Number of inverters 20 units
Total power 50000 kWac
Operating voltage 850-1425 V
Pnom ratio (DC:AC) 1.03

Total inverter power

Total power 50000 kWac
Number of inverters 20 units
Pnom ratio 1.03

Array losses**Thermal Loss factor**

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

Module mismatch losses

Loss Fraction 2.0 % at MPP

IAM loss factor

Incidence effect (IAM): Fresnel smooth glass, n = 1.526

DC wiring losses

Global array res. 0.30 mΩ
Loss Fraction 1.5 % at STC

Strings Mismatch loss

Loss Fraction 0.1 %

Module Quality Loss

Loss Fraction -1.3 %

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

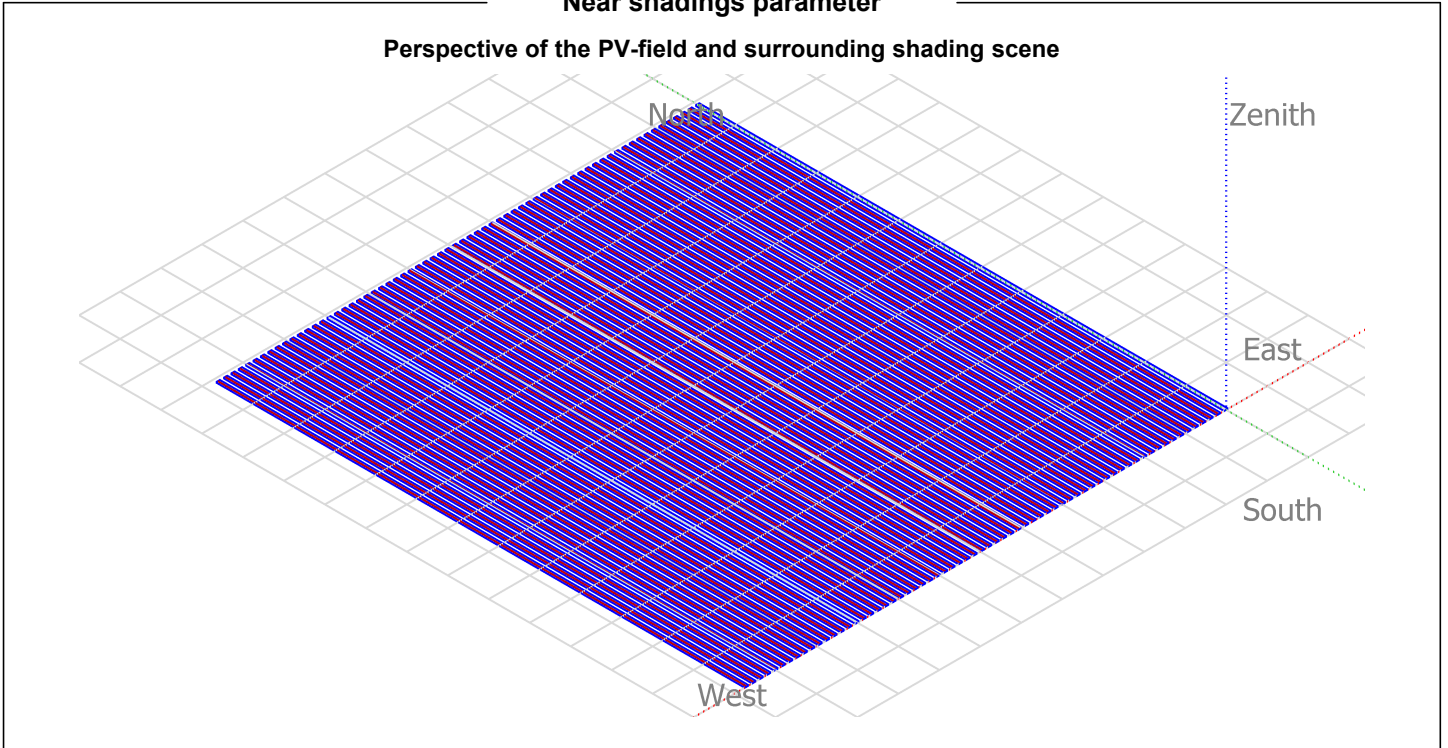


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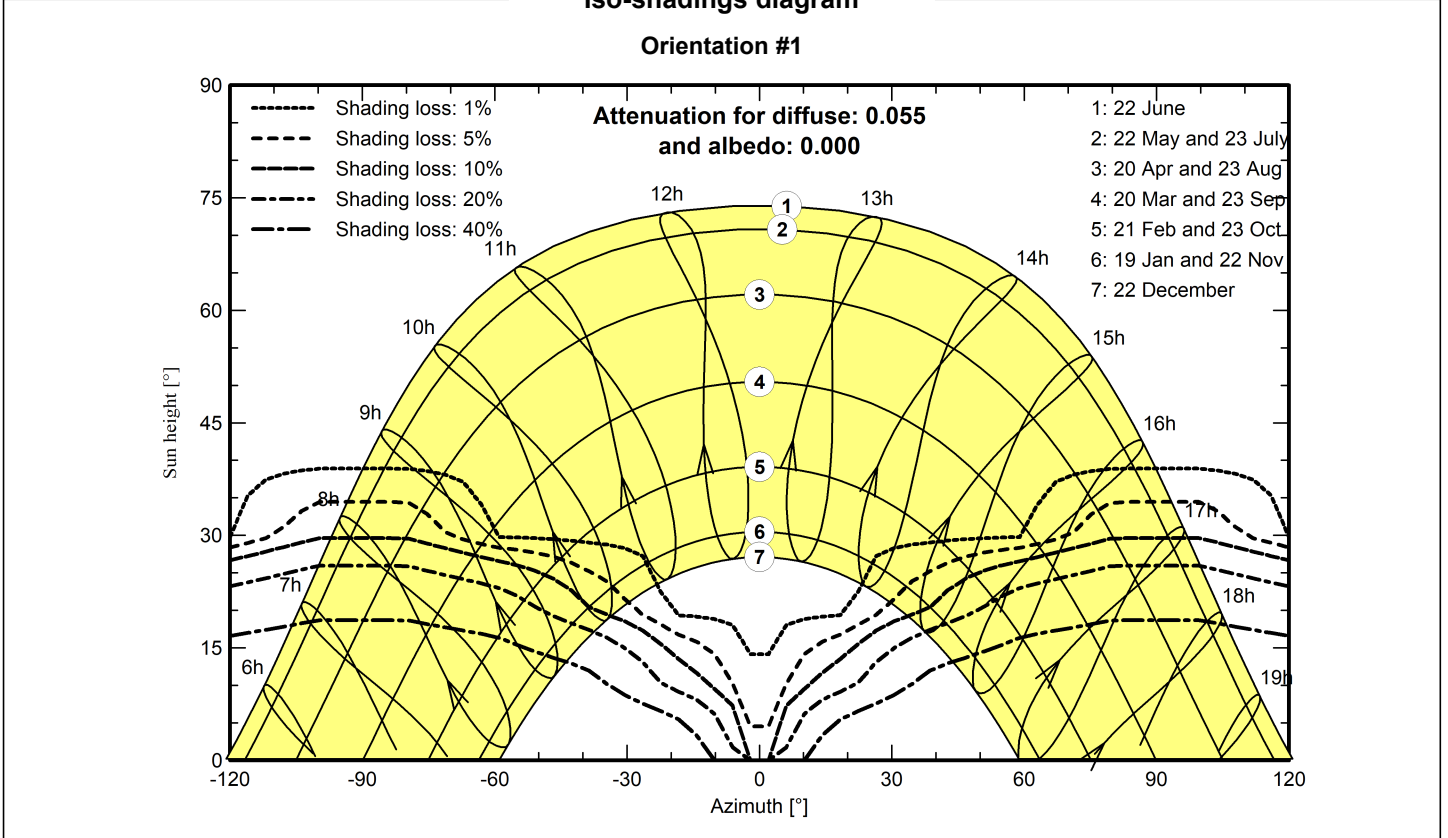
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Near shadings parameter



Iso-shadings diagram

Orientation #1





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Main results

System Production

Produced Energy

90 GWh/year

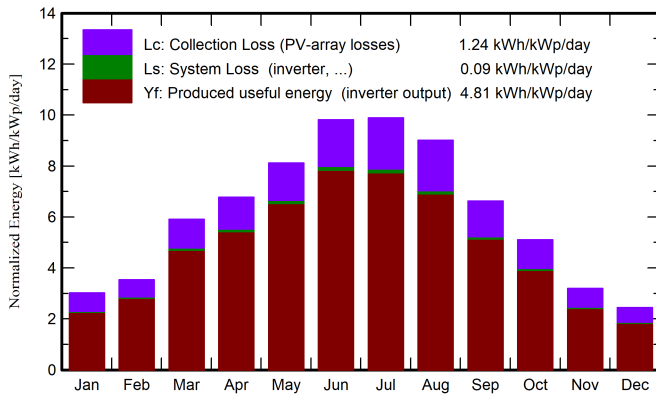
Specific production

1756 kWh/kWp/year

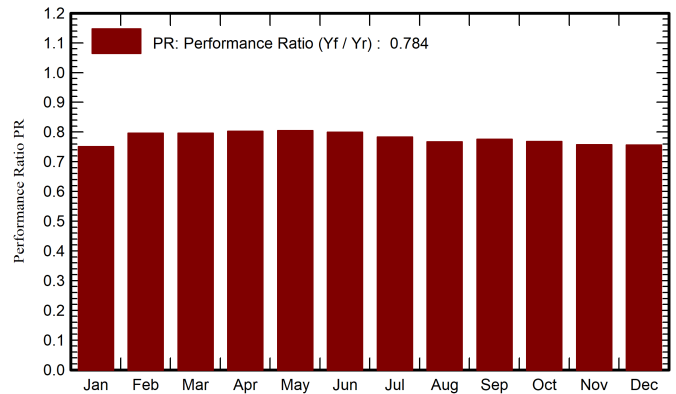
Performance Ratio PR

78.40 %

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 GWh	E_Grid GWh	PR ratio
January	62.6	25.18	9.50	93.5	74.0	3.67	3.60	0.751
February	73.5	36.21	9.72	99.0	83.4	4.12	4.04	0.796
March	132.5	56.18	12.37	183.3	157.2	7.62	7.48	0.796
April	153.0	71.24	14.86	203.4	177.7	8.52	8.37	0.802
May	192.6	87.32	19.10	251.8	224.9	10.59	10.40	0.805
June	221.2	81.19	23.59	294.6	266.5	12.30	12.08	0.799
July	226.6	71.97	26.87	306.7	276.0	12.55	12.32	0.783
August	198.9	68.75	26.82	279.2	244.4	11.19	10.99	0.767
September	144.7	60.05	22.52	198.8	171.8	8.05	7.91	0.776
October	109.9	38.71	19.48	158.1	133.0	6.34	6.23	0.768
November	67.3	30.77	14.18	95.9	77.5	3.80	3.73	0.757
December	54.4	28.00	10.81	75.6	60.4	2.99	2.93	0.757
Year	1637.3	655.57	17.53	2239.8	1946.7	91.74	90.09	0.784

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

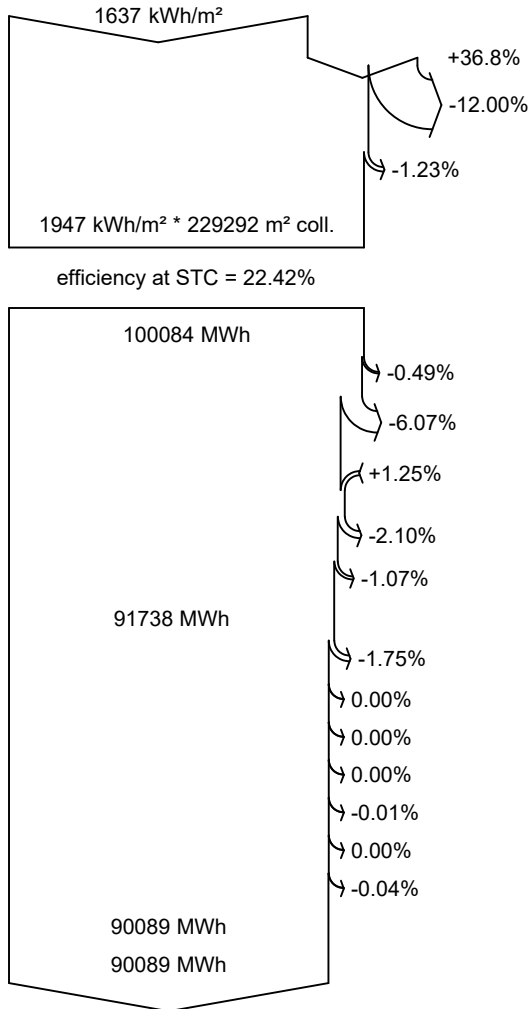


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Loss diagram



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



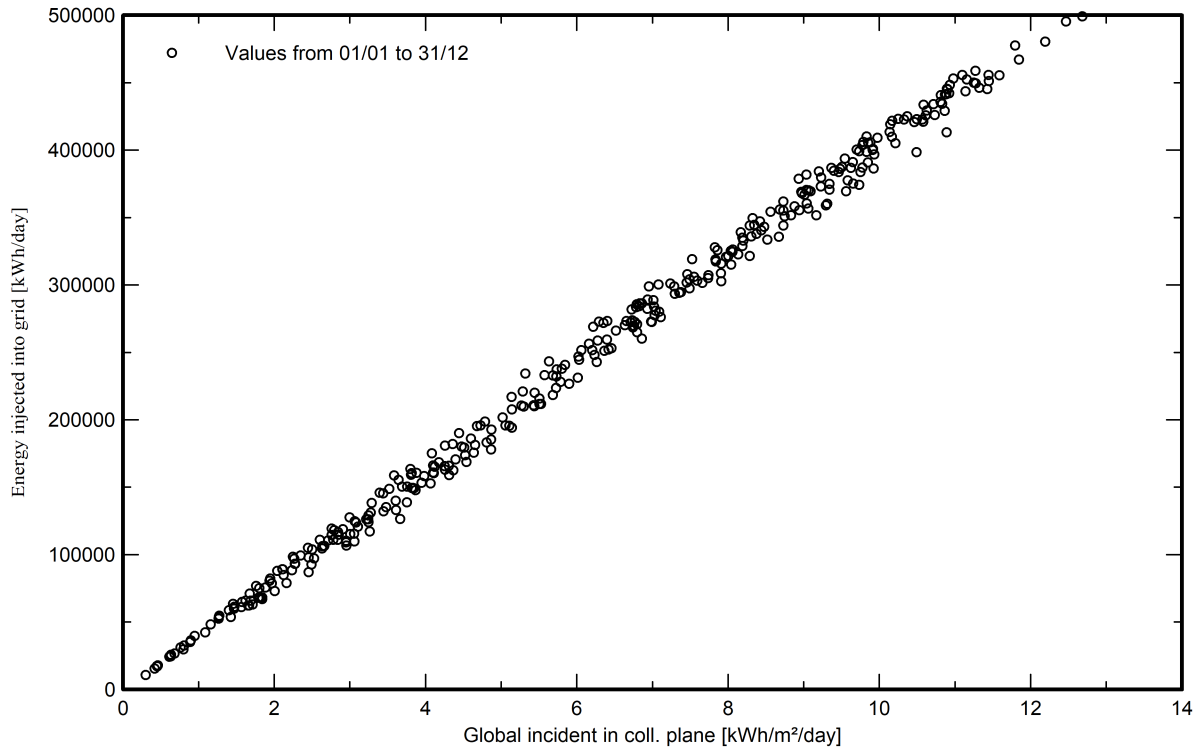
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Special graphs

Diagramma giornaliero entrata/uscita



Distribuzione potenza in uscita sistema

