



Soggetto promotore: **Gruppo Marseglia**

Soggetto proponente: **Masserie Salentine S.r.l. Società Agricola** (componente agricola)

Soggetto proponente: **Energetica Salentina S.r.l.** (componente fotovoltaica)

IMPIANTO AGRIVOLTAICO

SITO NEI COMUNI DI NARDÒ, SALICE SALENTINO E VEGLIE
IN PROVINCIA DI LECCE

Valutazione di Impatto Ambientale

(artt. 23-24-25 del D.Lgs. 152/2006)

Commissione Tecnica PNRR-PNIEC

(art. 17 del D.L. 77/2021, convertito in L. 108/2021)

Idea progettuale e coordinamento generale: **AG Advisory S.r.l.**

Paesaggio e supervisione generale: **CRETA S.r.l.**

Programma di ricerca "Paesaggi del Futuro", Responsabili scientifici: **Prof. Arch. Paolo Mellano, Prof.ssa Arch. Elena Vigliocco** (Politecnico di Torino)

Programma di ricerca "Ottimizzazione dell'agrivoltaico con oliveti a siepe: analisi numerico matematica", Responsabili scientifici: **PhD Cristiano Tamborrino** (Università degli Studi di Bari), **PhD Elisa Gatto** (Biologa ambientale)

Postproduzione: **Galante – Menichini Architetti per AG Advisory S.r.l.**

Supporto grafico: **Heriscape Progetti S.r.l. STP per AG Advisory S.r.l.**

Progettisti:

Progetto agricolo: **Prof. Massimo Monteleone** (Università degli Studi di Foggia)
Dott. Agr. Barnaba Marinosci

Progetto impianto fotovoltaico: **Ing. Andrea D'Ovidio**

Progetto strutture: **Ing. Giovanni Errico**

Progetto opere di connessione: **Ing. Andrea D'Ovidio**

Contributi specialistici:

Acustica: **Ing. Massimo Rah**

Agronomia: **Dott. Agr. Barnaba Marinosci**

Approvvigionamento idrico: **Geol. Massimilian Brandi**

Archeologia: **Dott.ssa Caterina Polito**

Clima e PMA: **Dott.ssa Elisa Gatto**

Fauna: **Dott. Giacomo Marzano**

Geologia: **Geol. Pietro Pepe**

Idraulica: **Ing. Luigi Fanelli**

Rilievi: **Studio Tafuro**

Risparmio idrico: **Netafim Italia S.r.l.**

Vegetazione e microclima: **Dott. Leonardo Beccaris**

Cartella
VIA_2/

Identificatore:
2_PAGRVLTREL06_ALL

Report simulazione della producibilità

Descrizione Allegato documento di valutazione della producibilità: Report simulazione

Nome del file:
2_PAGRVLTREL06_ALL.pdf

Tipologia
Relazione

Scala
-

Autori elaborato: Ing. Andrea D'Ovidio

Rev.	Data	Descrizione
00	18/03/24	Prima emissione
01		
02		

Spazio riservato agli Enti:

PVsyst - Simulation report

Grid-Connected System

Project: Masseria Salentine

Variant: Nuova variante di simulazione

Unlimited Trackers with backtracking

System power: 291.3 MWp

Eurovillage - Italy

Author

A&d ingegneria snc (Italy)



Project: Masseria Salentine

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PVsyst V7.4.4

VCO, Simulation date:
14/12/23 11:58
with v7.4.4

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Project summary

Geographical Site	Situation	Project settings
Eurovillage	Latitude 40.35 °N	Albedo 0.20
Italy	Longitude 17.84 °E	
	Altitude 66 m	
	Time zone UTC+1	
Meteo data		
Eurovillage		
Meteonorm 8.1, Sat=100% - Sintetico		

System summary

Grid-Connected System	Unlimited Trackers with backtracking	
PV Field Orientation	Tracking algorithm	Near Shadings
Orientation	Astronomic calculation	No Shadings
Tracking horizontal axis	Backtracking activated	
System information		
PV Array	Inverters	
Nb. of modules 485548 units	Nb. of units 67 units	
Pnom total 291.3 MWp	Pnom total 305.5 MWac	
	Grid power limit 300.0 MWac	
	Grid lim. Pnom ratio 0.971	
User's needs		
Unlimited load (grid)		

Results summary

Produced Energy 556781214 kWh/year	Specific production 1911 kWh/kWp/year	Perf. Ratio PR 89.56 %
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Table of contents

Project and results summary	2
General parameters, PV Array Characteristics, System losses	3
Main results	6
Loss diagram	7
Predef. graphs	8
Single-line diagram	9



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A&d ingegneria snc (Italy)

General parameters

Grid-Connected System

PV Field Orientation

Orientation

Tracking horizontal axis

Unlimited Trackers with backtracking

Tracking algorithm

Astronomic calculation

Backtracking activated

Backtracking array

Nb. of trackers 10 units

Unlimited trackers

Sizes

Tracker Spacing 12.0 m

Collector width 2.23 m

Ground Cov. Ratio (GCR) 18.6 %

Left inactive band 0.02 m

Right inactive band 0.02 m

Phi min / max. -/+ 55.0 °

Backtracking strategy

Phi limits for BT -/+ 79.1 °

Backtracking pitch 12.0 m

Backtracking width 2.23 m

Mode Automatic

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 12.00 m

Tracker width 2.27 m

GCR 18.9 %

Axis height above ground 2.40 m

Bifacial model definitions

Ground albedo 0.10

Bifaciality factor 80 %

Rear shading factor 5.0 %

Rear mismatch loss 10.0 %

Shed transparent fraction 0.0 %

Grid power limitation

Active power 300.0 MWac

Pnom ratio 0.971

PV Array Characteristics

PV module

Manufacturer Longi Solar

Model LR7-72HGD-600M

(Custom parameters definition)

Unit Nom. Power 600 Wp

Number of PV modules 485548 units

Nominal (STC) 291.3 MWp

Modules 17341 string x 28 In series

At operating cond. (50°C)

Pmpp 284.4 MWp

U mpp 1182 V

I mpp 240519 A

Inverter

Manufacturer Siemens

Model Sinacon PV4560

(Original PVsyst database)

Unit Nom. Power 4560 kWac

Number of inverters 67 units

Total power 305520 kWac

Operating voltage 919-1500 V

Pnom ratio (DC:AC) 0.95

Power sharing within this inverter



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PV Array Characteristics

Total PV power

Nominal (STC) 291329 kWp
 Total 485548 modules
 Module area 1311556 m²
 Cell area 1157997 m²

Total inverter power

Total power 305520 kWac
 Number of inverters 67 units
 Pnom ratio 0.95

Array losses

Array Soiling Losses

Loss Fraction 0.5 %

Thermal Loss factor

Module temperature according to irradiance
 U_c (const) 29.0 W/m²K
 U_v (wind) 0.0 W/m²K/m/s

DC wiring losses

Global array res. 0.076 mΩ
 Loss Fraction 1.5 % at STC

LID - Light Induced Degradation

Loss Fraction 1.5 %

Module Quality Loss

Loss Fraction -0.7 %

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

System losses

Unavailability of the system

Time fraction 1.0 %
 3.7 days,
 3 periods

Auxiliaries loss

constant (fans) 670 kW
 0.0 kW from Power thresh.
 Night aux. cons. 335 kW

AC wiring losses

Inv. output line up to MV transfo

Inverter voltage 630 Vac tri
 Loss Fraction 1.00 % at STC

Inverter: Sinacon PV4560

Wire section (67 Inv.) Alu 67 x 3 x 2500 mm²
 Average wires length 74 m

MV line up to HV Transfo

MV Voltage 30 kV
 Average each inverter
 Wires Alu 3 x 400 mm²
 Length 13290 m
 Loss Fraction 0.50 % at STC

HV line up to Injection

HV line voltage 380 kV
 Wires Alu 3 x 1200 mm²
 Length 7000 m
 Loss Fraction 0.04 % at STC



AC losses in transformers

MV transfo

Medium voltage 30 kV

Transformer from Datasheets

Nominal power 4500 kVA
Iron Loss 0.45 kVA
Iron loss fraction 0.01 % of PNom
Copper loss 89.55 kVA
Copper loss fraction 1.99 % at PNom
Coils equivalent resistance 3 x 1.76 mΩ

Operating losses at STC (full system)

Nb. identical MV transfos 67
Nominal power at STC 287.0 MVA
Iron loss 30.15 kVA
Iron loss fraction 0.01 % at STC
Copper loss 5435.36 kVA
Copper loss fraction 1.89 % at STC

HV transfo

Grid voltage 380 kV

Transformer from Datasheets

Nominal power 300000 kVA
Iron Loss (24/24 Connexion) 30.00 kVA
Iron loss fraction 0.01 % of PNom
Copper loss 2970.00 kVA
Copper loss fraction 0.99 % at PNom
Coils equivalent resistance 3 x 29.70 mΩ



Main results

System Production

Produced Energy 556781214 kWh/year

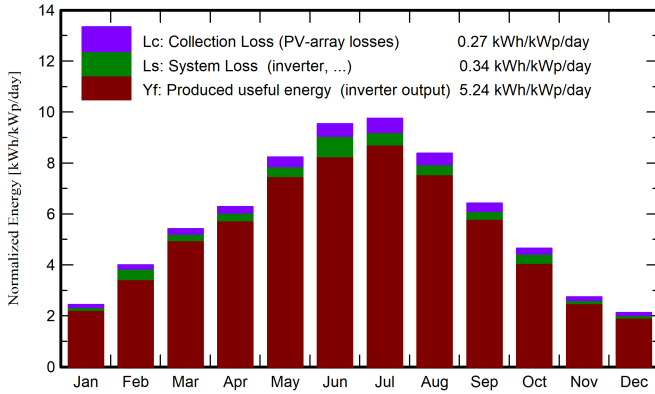
Specific production

1911 kWh/kWp/year

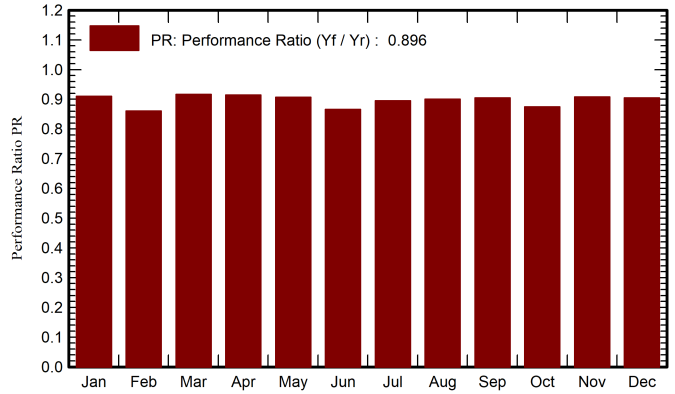
Perf. Ratio PR

89.56 %

Normalized productions (per installed kWp)



Performance Ratio PR



Balances and main results

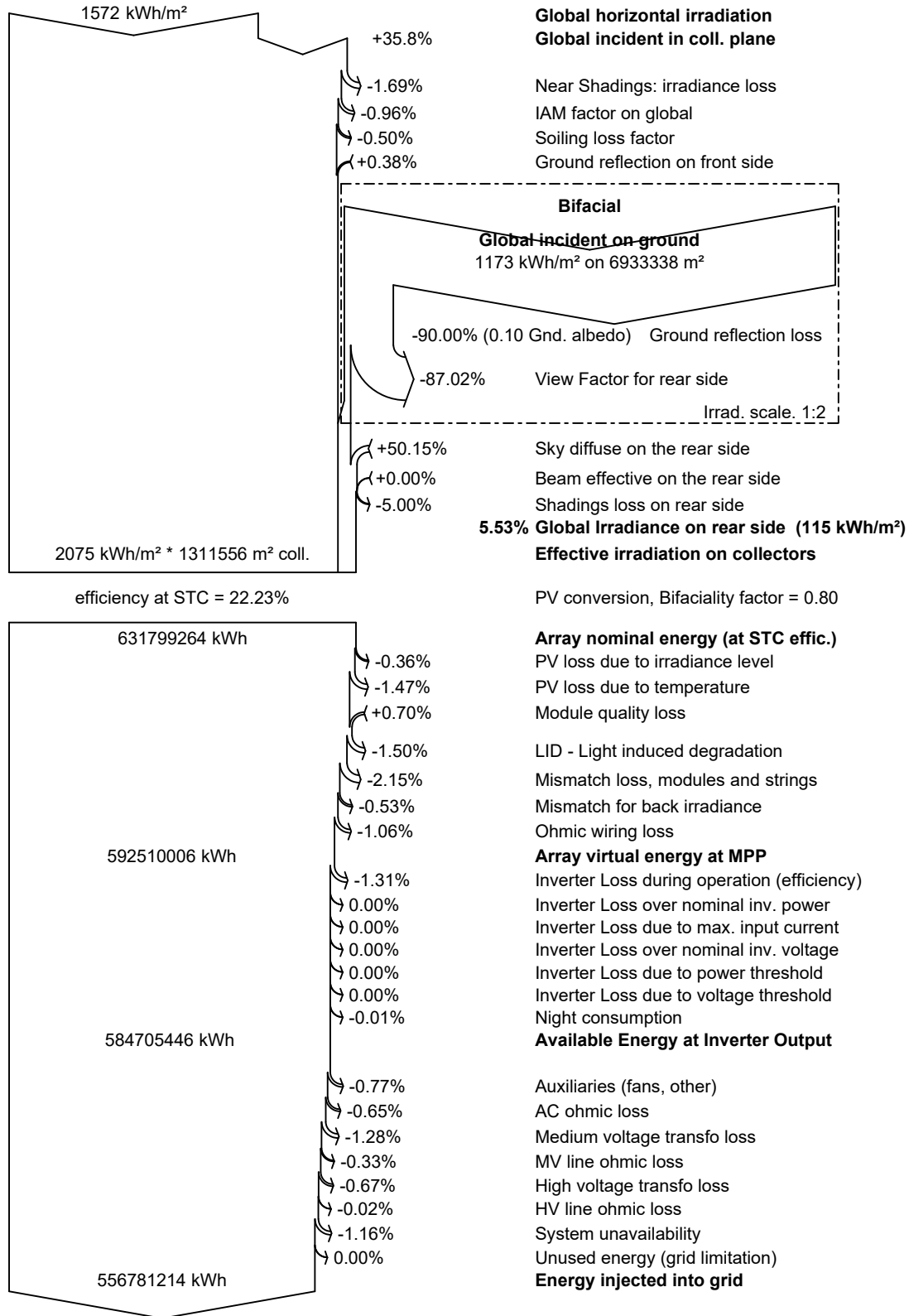
	GlobHor kWh/m ²	DiffHor kWh/m ²	T_Amb °C	GlobInc kWh/m ²	GlobEff kWh/m ²	EArray kWh	E_Grid kWh	PR ratio
January	56.4	28.08	9.32	75.9	72.5	21169907	20112176	0.910
February	79.1	36.96	10.03	111.9	108.0	31415100	28060727	0.861
March	122.9	53.27	12.69	168.1	163.3	47184877	44902397	0.917
April	145.4	70.97	15.77	188.7	183.4	52869551	50274064	0.915
May	193.3	83.88	20.69	255.4	249.1	71074772	67499407	0.907
June	212.2	78.92	25.62	286.3	280.0	79174947	72193985	0.866
July	218.9	70.67	28.92	302.4	295.9	83149011	78826411	0.895
August	192.7	74.25	28.69	260.1	254.0	71790821	68215122	0.900
September	138.9	53.42	23.15	192.8	187.8	53425798	50784406	0.904
October	103.3	44.78	19.16	144.2	139.7	40095462	36757504	0.875
November	60.5	32.89	14.70	82.3	78.8	22879948	21784380	0.908
December	48.2	27.47	10.72	65.9	62.6	18279814	17370635	0.905
Year	1571.8	655.57	18.34	2134.0	2075.2	592510006	556781214	0.896

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		



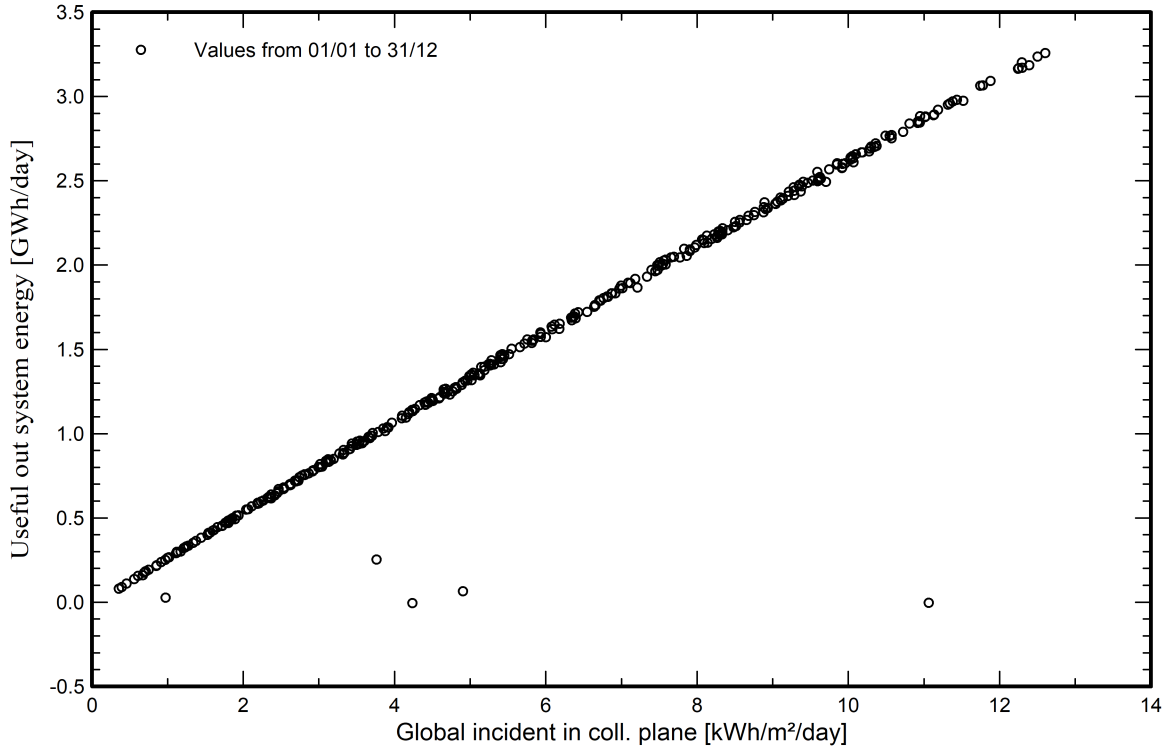
Loss diagram



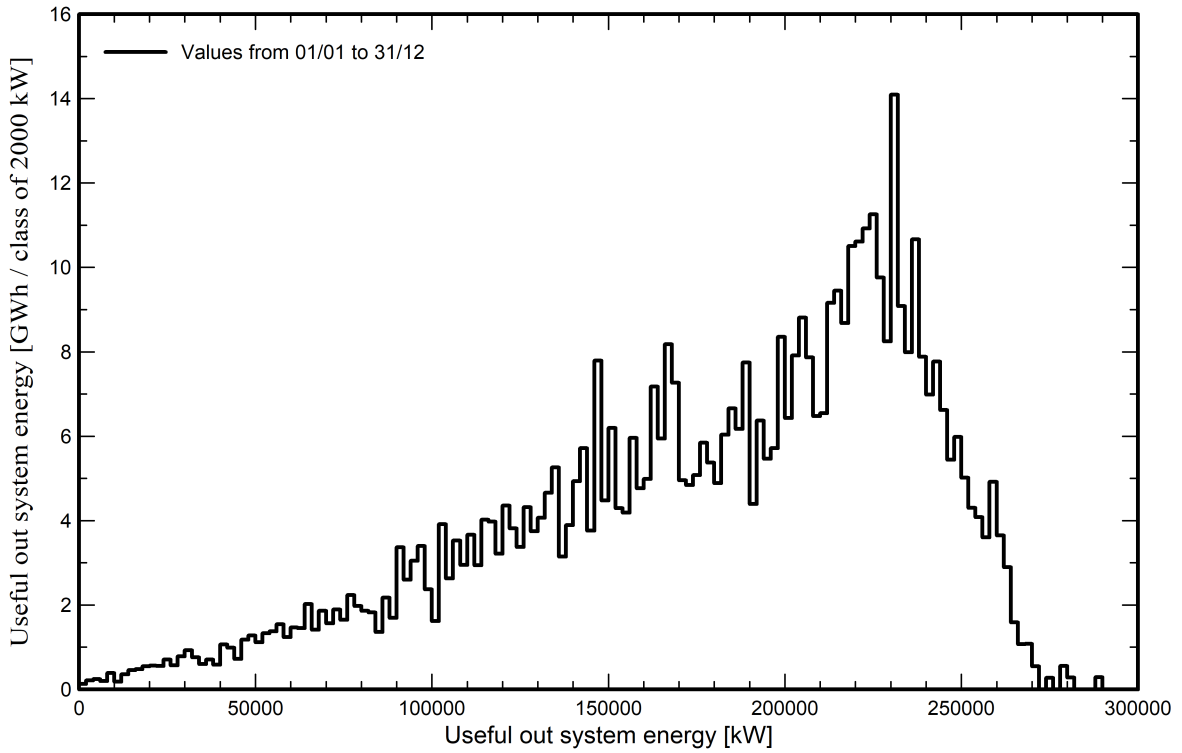


Predef. graphs

Diagramma giornaliero entrata/uscita



Distribuzione potenza in uscita sistema

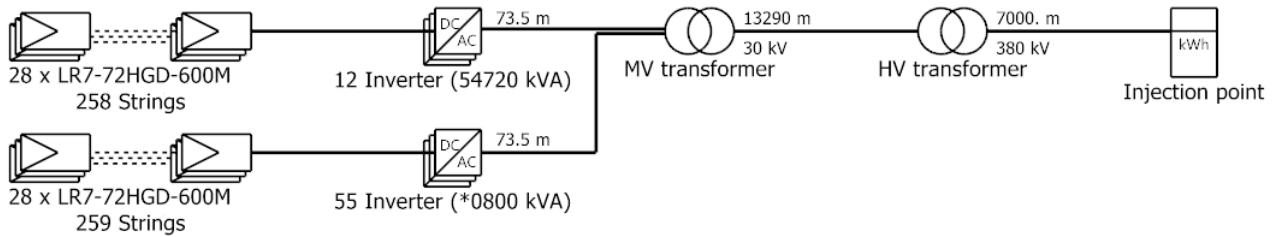




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Single-line diagram



PV module	LR7-72HGD-600M
Inverter	Sinacon PV4560
String	28 x LR7-72HGD-600M

Masseria Salentine

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VC0 : Nuova variante di simulazione

14/12/23