



NEX 051 - San Pancrazio Salentino

Comuni: San Pancrazio Salentino e San Donaci

Provincia: Brindisi

Regione: Puglia

Nome Progetto:

NEX 051 - San Pancrazio Salentino

Progetto di un impianto agrivoltaico sito nei comuni di San Donaci e San Pancrazio Salentino in località "Mass. San Marco" di potenza nominale pari a 68.05 MWp in DC

Proponente:

SAN PANCRAZIO SOLAR S.r.l.

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PROGETTO DEFINITIVO

Nome documento:

Stima Producibilità Impianto

Commessa	Codice elaborato	Nome file
30190245	PRO-REL-12	PRO-REL-12 - Stima Producibilità Impianto

Rev.	Data	Oggetto revisione	Redatto	Verificato	Approvato
00	Dic. 23	Prima Emissione	MA	MA	SDA

PVsyst - Simulation report

Grid-Connected System

Project: San Pancrazio

Variant: New simulation variant

Tracking system

System power: 68.05 MWp

San Pancrazio Salentino - Italy



Project: San Pancrazio

Variant: New simulation variant

ARCADIS (italy)

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Project summary

Geographical Site San Pancrazio Salentino Italy	Situation Latitude 40.42 °N Longitude 17.83 °E Altitude 64 m Time zone UTC+1	Project settings Albedo 0.20
Meteo data San Pancrazio Salentino PVGIS api TMY		

System summary

Grid-Connected System	Tracking system	Near Shadings
PV Field Orientation Orientation Tracking plane, horizontal N-S axis Avg axis azim. 0 °	Tracking algorithm Astronomic calculation	Linear shadings : Fast (table) Diffuse shading Automatic
System information PV Array Nb. of modules 98616 units Pnom total 68.05 MWp	Inverters Nb. of units 16 units Pnom total 64.00 MWac Pnom ratio 1.063	
User's needs Unlimited load (grid)		

Results summary

Produced Energy 127785857 kWh/year	Specific production 1878 kWh/kWp/year	Perf. Ratio PR 79.70 %
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Table of contents

Project and results summary	2
General parameters, PV Array Characteristics, System losses	3
Near shading definition - Iso-shadings diagram	5
Main results	6
Loss diagram	7
Predef. graphs	8
Single-line diagram	9



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General parameters

Grid-Connected System		Tracking system			
PV Field Orientation		Tracking algorithm		Trackers configuration	
Orientation		Astronomic calculation		Nb. of trackers 3646 units	
Tracking plane, horizontal N-S axis				Sizes	
Avg axis azim. 0 °				Tracker Spacing 6.60 m	
				Collector width 2.38 m	
				Ground Cov. Ratio (GCR) 36.1 %	
				Phi min / max. -/+ 55.0 °	
				Shading limit angles	
				Phi limits for BT -/+ 68.7 °	
Models used		Near Shadings		User's needs	
Transposition	Perez	Linear shadings : Fast (table)		Unlimited load (grid)	
Diffuse	Imported	Diffuse shading Automatic			
Circumsolar	separate				
Horizon					
Free Horizon					
Bifacial system					
Model	2D Calculation				
	unlimited trackers				
Bifacial model geometry				Bifacial model definitions	
Tracker Spacing	6.60 m	Ground albedo		0.20	
Tracker width	2.38 m	Bifaciality factor		72 %	
GCR	36.1 %	Rear shading factor		17.0 %	
Axis height above ground	2.10 m	Rear mismatch loss		10.0 %	
		Shed transparent fraction		0.0 %	

PV Array Characteristics

PV module		Inverter	
Manufacturer	Trina Solar	Manufacturer	SMA
Model	TSM-DEG21C-20-690Wp Vertex	Model	Sunny Central 4000 UP
(Custom parameters definition)		(Original PVsyst database)	
Unit Nom. Power	690 Wp	Unit Nom. Power	4000 kWac
Number of PV modules	98616 units	Number of inverters	16 units
Nominal (STC)	68.05 MWp	Total power	64000 kWac
Modules	3522 string x 28 In series	Operating voltage	880-1325 V
At operating cond. (50°C)		Pnom ratio (DC:AC)	1.06
Pmpp	62.34 MWp		
U mpp	1017 V		
I mpp	61267 A		
Total PV power		Total inverter power	
Nominal (STC)	68045 kWp	Total power	64000 kWac
Total	98616 modules	Number of inverters	16 units
Module area	306336 m²	Pnom ratio	1.06



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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. 0.55 mΩ
Loss Fraction 3.0 % at STC

LID - Light Induced Degradation

Loss Fraction 1.5 %

Module Quality Loss

Loss Fraction -0.4 %

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

Auxiliaries loss

constant (fans) 114.0 kW
0.0 kW from Power thresh.

AC wiring losses

Inv. output line up to MV transfo

Inverter voltage 600 Vac tri
Loss Fraction 3.61 % at STC

Inverter: Sunny Central 4000 UP

Wire section (16 Inv.) Copper 16 x 3 x 2500 mm²
Average wires length 414 m

AC losses in transformers

MV transfo

Medium voltage 36 kV

One transfo parameters

Nominal power at STC 4.17 MVA
Iron Loss (24/24 Connexion) 4.17 kVA
Iron loss fraction 0.10 % at STC
Copper loss 41.71 kVA
Copper loss fraction 1.00 % at STC
Coils equivalent resistance 3 x 0.86 mΩ

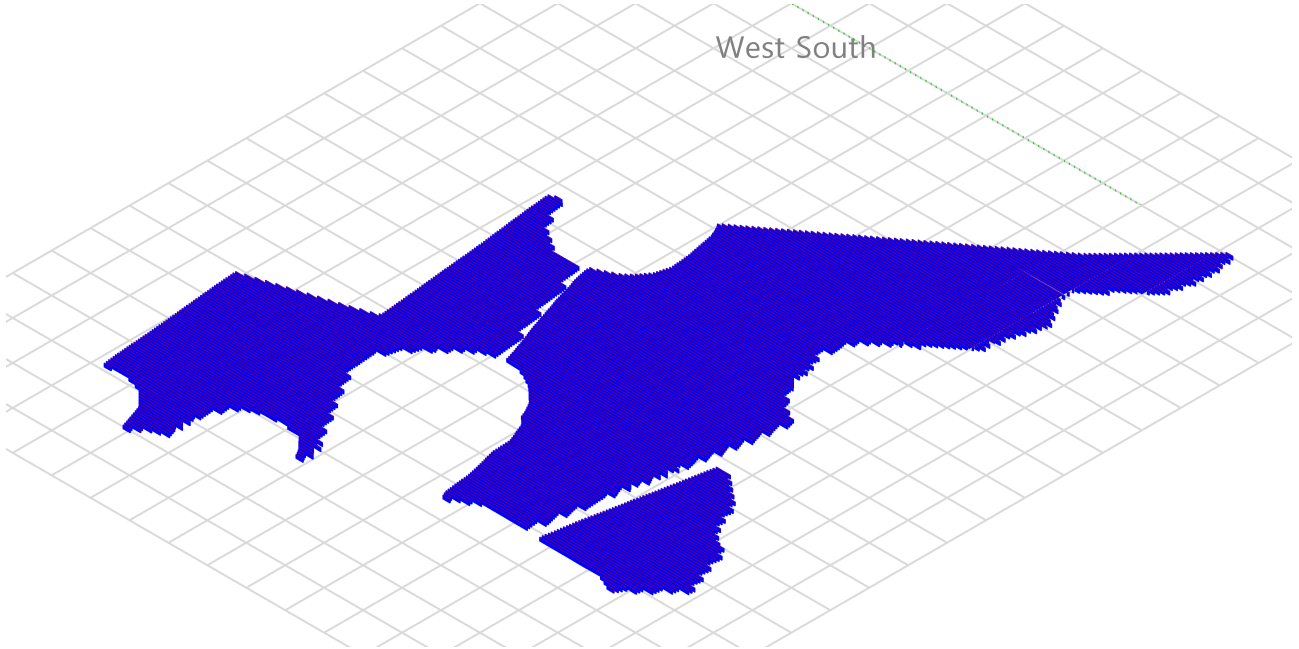
Operating losses at STC (full system)

Nb. identical MV transfos 16
Nominal power at STC 66.74 MVA
Iron loss (24/24 Connexion) 66.74 kVA
Copper loss 667.38 kVA



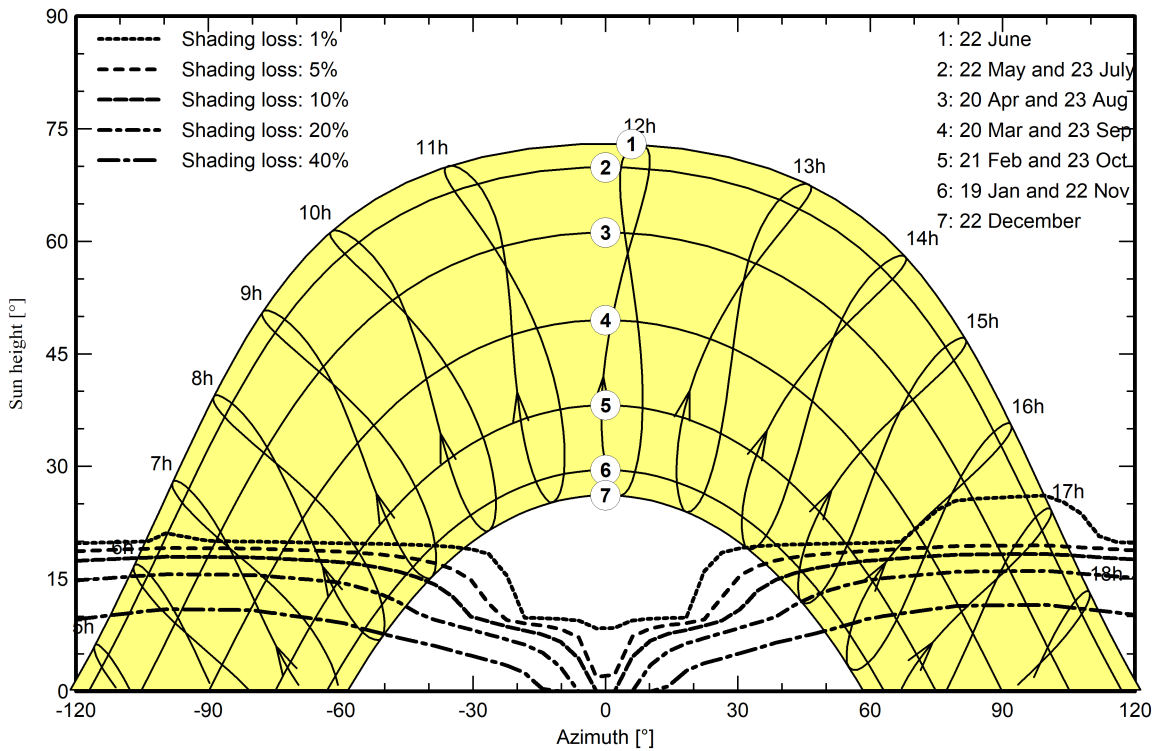
Near shadings parameter

Perspective of the PV-field and surrounding shading scene



Iso-shadings diagram

Orientation #1





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Main results

System Production

Produced Energy 127785857 kWh/year

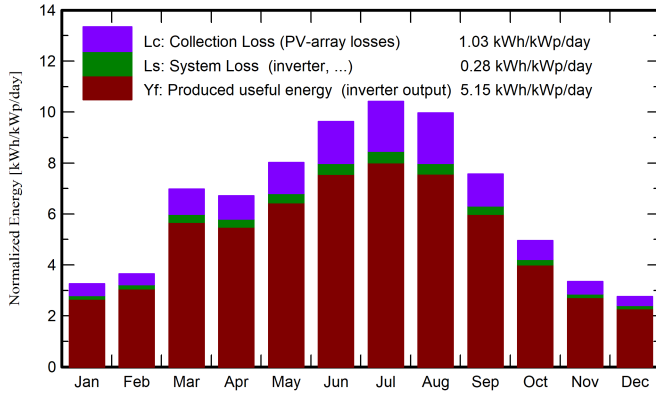
Specific production

1878 kWh/kWp/year

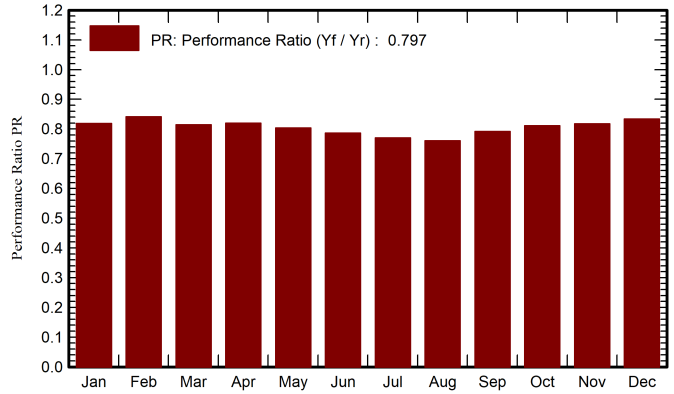
Perf. Ratio PR

79.70 %

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	68.1	28.80	10.68	101.1	89.2	5926246	5633868	0.819
February	72.9	35.13	8.97	102.2	93.0	6163458	5849770	0.841
March	150.8	49.79	13.38	216.4	201.5	12653491	11989051	0.814
April	150.8	63.55	14.92	201.2	189.6	11859528	11224203	0.820
May	187.4	73.61	17.75	248.7	235.0	14385097	13607842	0.804
June	213.1	69.49	22.85	288.7	275.1	16329819	15450580	0.787
July	234.9	66.32	26.77	322.9	307.3	17874138	16919815	0.770
August	218.9	54.35	28.31	308.9	292.9	16875086	15981290	0.760
September	159.3	54.26	21.21	227.1	211.8	12909769	12243920	0.792
October	108.6	45.08	18.40	153.5	141.0	8911491	8472412	0.811
November	69.8	32.61	12.63	100.3	88.8	5865141	5575875	0.817
December	58.6	25.82	11.05	85.3	76.3	5089589	4837232	0.833
Year	1693.1	598.81	17.30	2356.4	2201.7	134842851	127785857	0.797

Legends

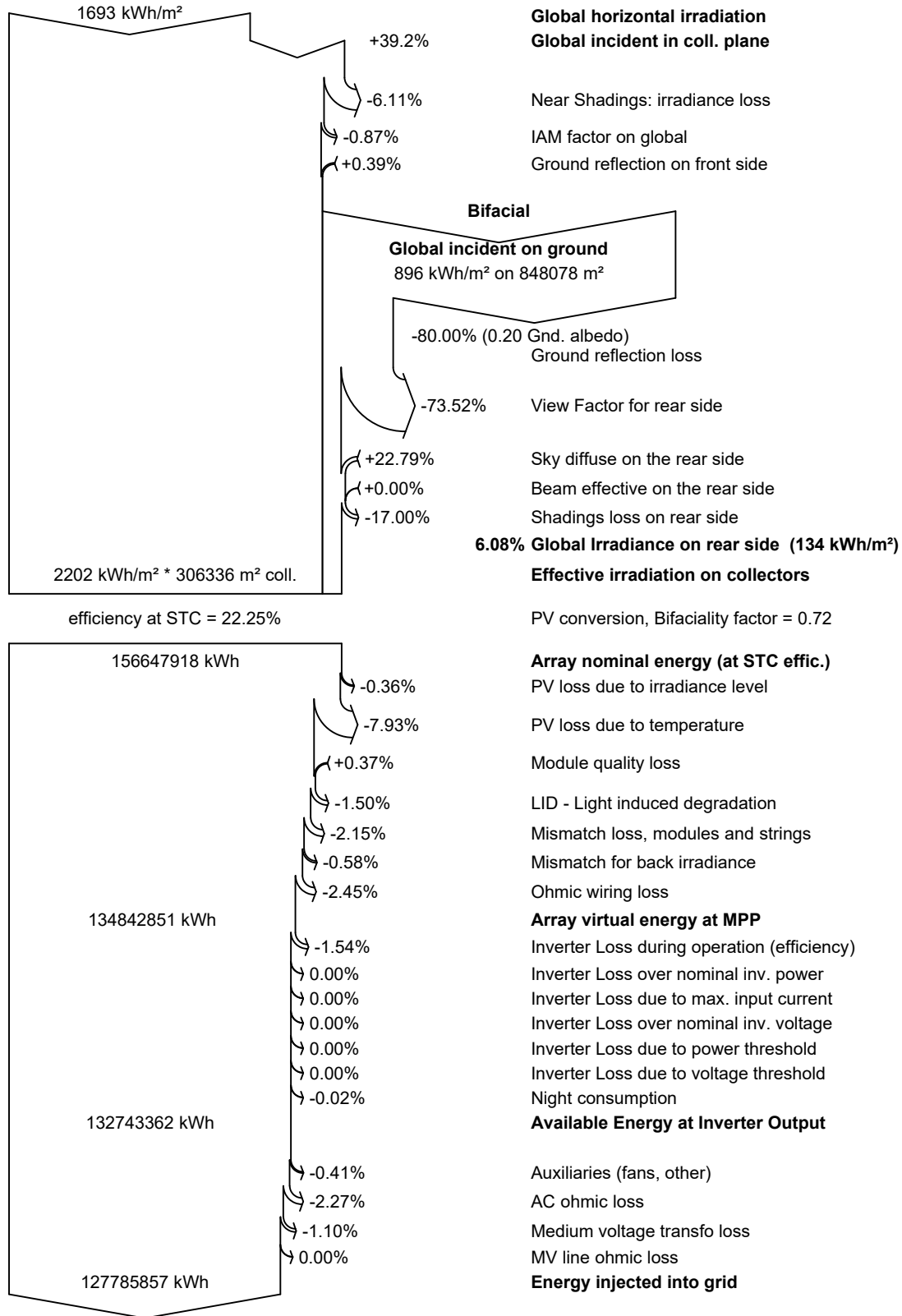
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|---------|--|--------|---|
| GlobHor | Global horizontal irradiation | EArray | Effective energy at the output of the array |
| DiffHor | Horizontal diffuse irradiation | E_Grid | Energy injected into grid |
| T_Amb | Ambient Temperature | PR | Performance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



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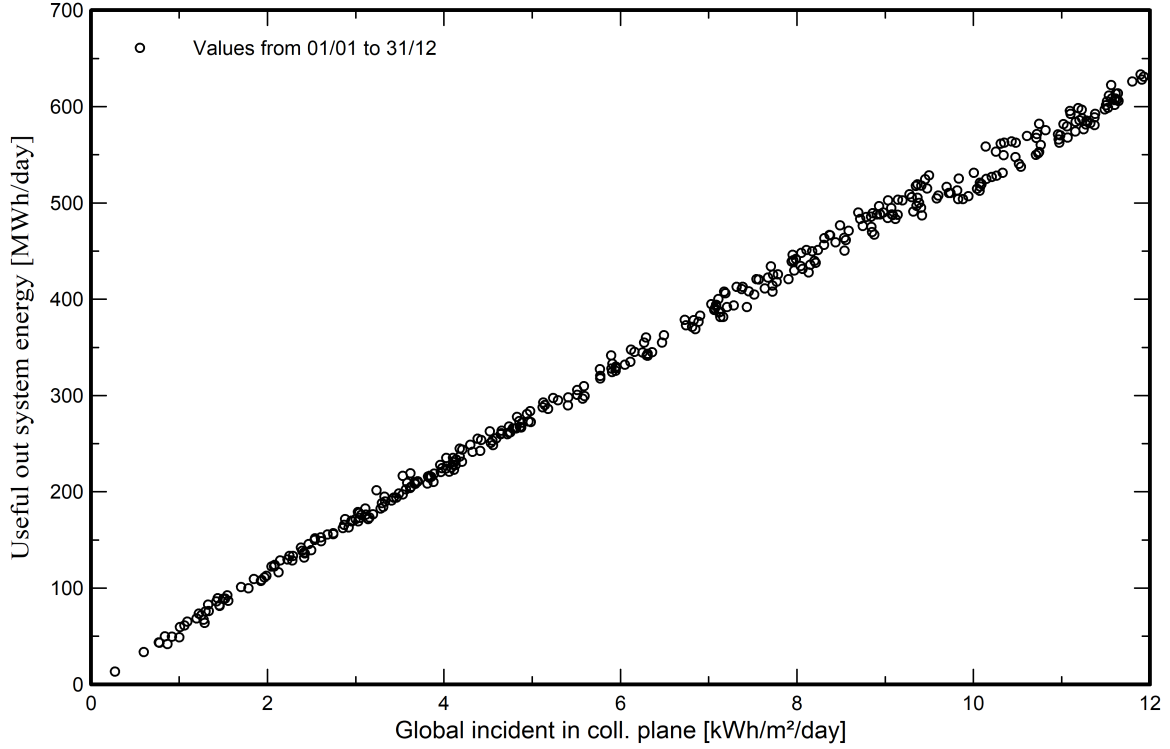
Loss diagram



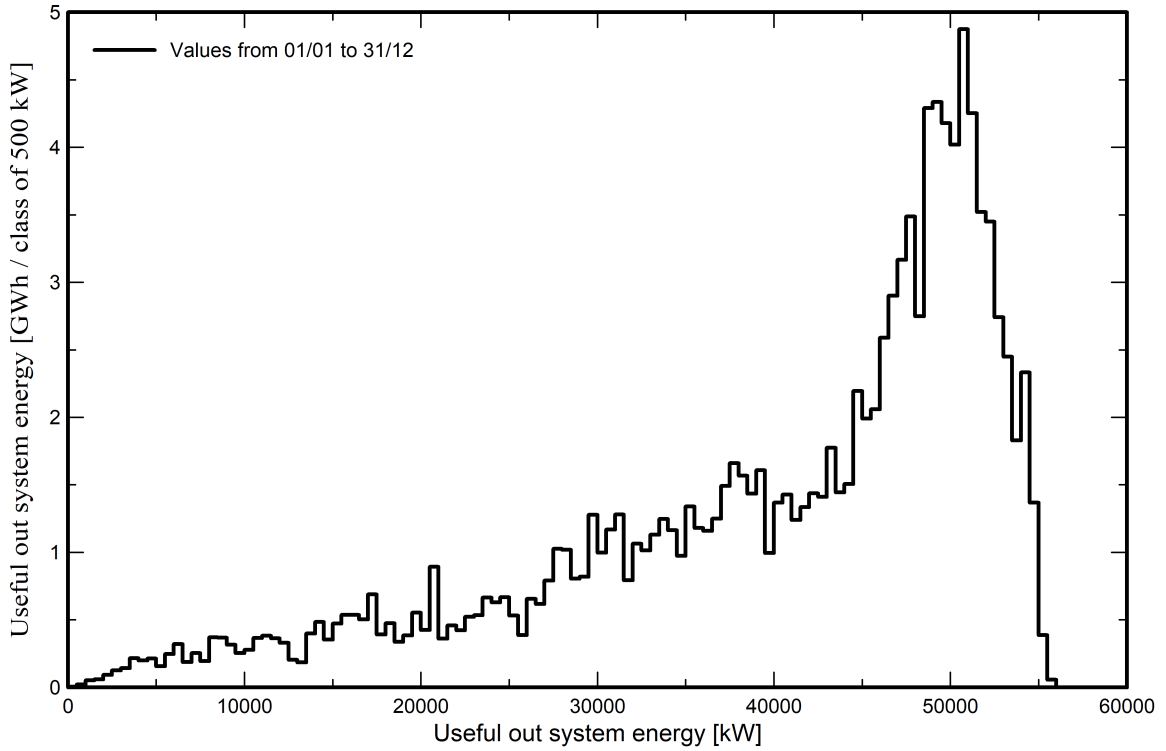


Predef. graphs

Daily Input/Output diagram



System Output Power Distribution

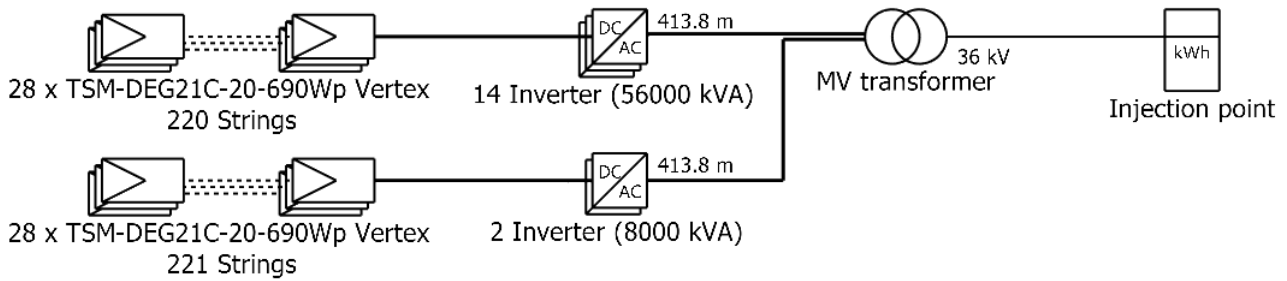




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Single-line diagram



PV module	TSM-DEG21C-20-690Wp Vertex
Inverter	Sunny Central 4000 UP
String	28 x TSM-DEG21C-20-690Wp Vertex

San Pancrazio

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