REGIONE PUGLIA

PROVINCIA di FOGGIA

COMUNE di APRICENA

COMUNE di SAN SEVERO

Società Proponente

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Opera

Progetto definitivo per la realizzazione di un impianto Fotovoltaico denominato “Apricena Industriale” da realizzarsi su aree industriali e cave nelle località "Podere Camilli - Tufara - San Giovanni - San Sabino", nel territorio comunale di Apricena (FG) per una potenza complessiva di 121,023 MWp e immissione di 96,300 MW, nonchè delle opere connesse ed infrastrutture indispensabili alla costruzione e all'esercizio dell'impianto nei comuni di Apricena (FG) e San Severo (FG)

AUTORITA' PROCEDENTE V.I.A. : MINISTERO DELL'AMBIENTE E DELLA SICUREZZA ENERGETICA

AUTORITA' PROCEDENTE A.U. : REGIONE PUGLIA

Oggetto

Nome Elaborato: P7MVN25_Calcoli Prel.Impianti_01

Descrizione Elaborato: Analisi producibilità Impianto

Rev.	Data	Oggetto della revisione	Elaborazione	Verifica	Approvazione
00	Novembre 2022	Progetto definitivo		Ing. A. Mezzina	AM ENERGY S.R.L.

Scala:

Formato:

Codice Pratica: P7MVN25

Version 7.2.5

PVsyst - Simulation report

Grid-Connected System

Project: AM_Rev0.1

Variant: Apricena industriale, fixed

Unlimited sheds

System power: 121.0 MWp

Apricena - Italia

Author

PVsyst V7.2.5
VC0, Simulation date:
10/01/23 19:33
with v7.2.5

Project summary

Geographical Site
Apricena
Italia

Situation

Latitude	41.79 °N
Longitude	15.44 °E
Altitude	67 m
Time zone	UTC+1

Project settings

Albedo	0.20

Meteo data
Apricena
Meteonorm 8.0 (1986-2005), Sat=77% - Sintetico

System summary

Grid-Connected System

Unlimited sheds

PV Field Orientation

Sheds	
tilt	30 °
azimuth	0 °

Near Shadings
Mutual shadings of sheds

User's needs
Unlimited load (grid)

System information

PV Array

Nb. of modules	214200 units
Pnom total	121.0 MWp

Inverters

Nb. of units	53 units
Pnom total	96.09 MWac
Pnom ratio	1.259

Results summary

Produced Energy	182975 MWh/year	Specific production	1512 kWh/kWp/year	Perf. Ratio PR	88.35 %

Table of contents

General parameters

Grid-Connected System — **Unlimited sheds**

PV Field Orientation

Orientation		Sheds configuration	Models used	
Sheds			Transposition	Perez
tilt	30 °		Diffuse	Perez, Meteonorm
azimuth	0 °		Circumsolar	separate

Horizon
Free Horizon

Near Shadings
Mutual shadings of sheds

User's needs
Unlimited load (grid)

Bifacial system
Model: 2D Calculation unlimited sheds

Bifacial model geometry		Bifacial model definitions	
Sheds spacing	7.00 m	Ground albedo	0.30
Sheds width	3.04 m	Bifaciality factor	80 %
Limit profile angle	19.2 °	Rear shading factor	5.0 %
GCR	43.4 %	Rear mismatch loss	10.0 %
Height above ground	1.50 m	Module transparency	0.0 %

PV Array Characteristics

PV module

Manufacturer	Jinkosolar
Model	JKM565M-7RL4-V
(Custom parameters definition)	
Unit Nom. Power	565 Wp
Number of PV modules	178668 units
Nominal (STC)	100.9 MWp

Inverter

Manufacturer	Santerno
Model	Sunway TG 1800 1500V TE - 640 EV
(Original PVsyst database)	
Unit Nom. Power	1995 kWac
Number of inverters	40 units
Total power	79800 kWac

Array #1 - B1

Number of PV modules	4368 units	Number of inverters	1 unit
Nominal (STC)	2468 kWp	Total power	1995 kWac
Modules	156 Strings x 28 In series		
At operating cond. (50°C)		Operating voltage	910-1300 V
Pmpp	2252 kWp	Pnom ratio (DC:AC)	1.24
U mpp	1117 V		
I mpp	2017 A		

Array #2 - B2

Number of PV modules	4396 units	Number of inverters	1 unit
Nominal (STC)	2484 kWp	Total power	1995 kWac
Modules	157 Strings x 28 In series		
At operating cond. (50°C)		Operating voltage	910-1300 V
Pmpp	2266 kWp	Pnom ratio (DC:AC)	1.24
U mpp	1117 V		
I mpp	2030 A		

Array #3 - B3

Number of PV modules	4396 units	Number of inverters	1 unit
Nominal (STC)	2484 kWp	Total power	1995 kWac
Modules	157 Strings x 28 In series		
At operating cond. (50°C)		Operating voltage	910-1300 V
Pmpp	2266 kWp	Pnom ratio (DC:AC)	1.24
U mpp	1117 V		
I mpp	2030 A		

PV Array Characteristics

Array #9 - M2

Number of PV modules	4564 units	Number of inverters	1 unit
Nominal (STC)	2579 kWp	Total power	1995 kWac
Modules	163 Strings x 28 In series		
At operating cond. (50°C)		Operating voltage	910-1300 V
Pmpp	2353 kWp	Pnom ratio (DC:AC)	1.29
U mpp	1117 V		
I mpp	2107 A		

Array #10 - M3

Number of PV modules	4536 units	Number of inverters	1 unit
Nominal (STC)	2563 kWp	Total power	1995 kWac
Modules	162 Strings x 28 In series		
At operating cond. (50°C)		Operating voltage	910-1300 V
Pmpp	2338 kWp	Pnom ratio (DC:AC)	1.28
U mpp	1117 V		
I mpp	2094 A		

Array #11 - M4

Number of PV modules	4564 units	Number of inverters	1 unit
Nominal (STC)	2579 kWp	Total power	1995 kWac
Modules	163 Strings x 28 In series		
At operating cond. (50°C)		Operating voltage	910-1300 V
Pmpp	2353 kWp	Pnom ratio (DC:AC)	1.29
U mpp	1117 V		
I mpp	2107 A		

Array #12 - M5

Number of PV modules	4480 units	Number of inverters	1 unit
Nominal (STC)	2531 kWp	Total power	1995 kWac
Modules	160 Strings x 28 In series		
At operating cond. (50°C)		Operating voltage	910-1300 V
Pmpp	2309 kWp	Pnom ratio (DC:AC)	1.27
U mpp	1117 V		
I mpp	2068 A		

Array #14 - P1

Number of PV modules	4032 units	Number of inverters	1 unit
Nominal (STC)	2278 kWp	Total power	1995 kWac
Modules	144 Strings x 28 In series		
At operating cond. (50°C)		Operating voltage	910-1300 V
Pmpp	2078 kWp	Pnom ratio (DC:AC)	1.14
U mpp	1117 V		
I mpp	1861 A		

Array #15 - P2

Number of PV modules	4816 units	Number of inverters	1 unit
Nominal (STC)	2721 kWp	Total power	1995 kWac
Modules	172 Strings x 28 In series		
At operating cond. (50°C)		Operating voltage	910-1300 V
Pmpp	2483 kWp	Pnom ratio (DC:AC)	1.36
U mpp	1117 V		
I mpp	2223 A		

PV Array Characteristics

Array #16 - P3

Number of PV modules	4536 units	Number of inverters	1 unit
Nominal (STC)	2563 kWp	Total power	1995 kWac
Modules	162 Strings x 28 In series		
At operating cond. (50°C)		Operating voltage	910-1300 V
Pmpp	2338 kWp	Pnom ratio (DC:AC)	1.28
U mpp	1117 V		
I mpp	2094 A		

Array #17 - P4

Number of PV modules	4480 units	Number of inverters	1 unit
Nominal (STC)	2531 kWp	Total power	1995 kWac
Modules	160 Strings x 28 In series		
At operating cond. (50°C)		Operating voltage	910-1300 V
Pmpp	2309 kWp	Pnom ratio (DC:AC)	1.27
U mpp	1117 V		
I mpp	2068 A		

Array #18 - P5

Number of PV modules	4480 units	Number of inverters	1 unit
Nominal (STC)	2531 kWp	Total power	1995 kWac
Modules	160 Strings x 28 In series		
At operating cond. (50°C)		Operating voltage	910-1300 V
Pmpp	2309 kWp	Pnom ratio (DC:AC)	1.27
U mpp	1117 V		
I mpp	2068 A		

Array #19 - P6

Number of PV modules	4592 units	Number of inverters	1 unit
Nominal (STC)	2594 kWp	Total power	1995 kWac
Modules	164 Strings x 28 In series		
At operating cond. (50°C)		Operating voltage	910-1300 V
Pmpp	2367 kWp	Pnom ratio (DC:AC)	1.30
U mpp	1117 V		
I mpp	2120 A		

Array #20 - S1.1

Number of PV modules	4480 units	Number of inverters	1 unit
Nominal (STC)	2531 kWp	Total power	1995 kWac
Modules	160 Strings x 28 In series		
At operating cond. (50°C)		Operating voltage	910-1300 V
Pmpp	2309 kWp	Pnom ratio (DC:AC)	1.27
U mpp	1117 V		
I mpp	2068 A		

Array #25 - S2.2

Number of PV modules	4536 units	Number of inverters	1 unit
Nominal (STC)	2563 kWp	Total power	1995 kWac
Modules	162 Strings x 28 In series		
At operating cond. (50°C)		Operating voltage	910-1300 V
Pmpp	2338 kWp	Pnom ratio (DC:AC)	1.28
U mpp	1117 V		
I mpp	2094 A		

PV Array Characteristics

Array #26 - S2.3

Number of PV modules	4508 units	Number of inverters	1 unit
Nominal (STC)	2547 kWp	Total power	1995 kWac
Modules	161 Strings x 28 In series		
At operating cond. (50°C)		Operating voltage	910-1300 V
Pmpp	2324 kWp	Pnom ratio (DC:AC)	1.28
U mpp	1117 V		
I mpp	2081 A		

Array #27 - S2.4

Number of PV modules	4536 units	Number of inverters	1 unit
Nominal (STC)	2563 kWp	Total power	1995 kWac
Modules	162 Strings x 28 In series		
At operating cond. (50°C)		Operating voltage	910-1300 V
Pmpp	2338 kWp	Pnom ratio (DC:AC)	1.28
U mpp	1117 V		
I mpp	2094 A		

Array #28 - S2.5

Number of PV modules	4564 units	Number of inverters	1 unit
Nominal (STC)	2579 kWp	Total power	1995 kWac
Modules	163 Strings x 28 In series		
At operating cond. (50°C)		Operating voltage	910-1300 V
Pmpp	2353 kWp	Pnom ratio (DC:AC)	1.29
U mpp	1117 V		
I mpp	2107 A		

Array #29 - S2.6

Number of PV modules	4536 units	Number of inverters	1 unit
Nominal (STC)	2563 kWp	Total power	1995 kWac
Modules	162 Strings x 28 In series		
At operating cond. (50°C)		Operating voltage	910-1300 V
Pmpp	2338 kWp	Pnom ratio (DC:AC)	1.28
U mpp	1117 V		
I mpp	2094 A		

Array #30 - S2.7

Number of PV modules	4368 units	Number of inverters	1 unit
Nominal (STC)	2468 kWp	Total power	1995 kWac
Modules	156 Strings x 28 In series		
At operating cond. (50°C)		Operating voltage	910-1300 V
Pmpp	2252 kWp	Pnom ratio (DC:AC)	1.24
U mpp	1117 V		
I mpp	2017 A		

Array #31 - S2.8

Number of PV modules	4480 units	Number of inverters	1 unit
Nominal (STC)	2531 kWp	Total power	1995 kWac
Modules	160 Strings x 28 In series		
At operating cond. (50°C)		Operating voltage	910-1300 V
Pmpp	2309 kWp	Pnom ratio (DC:AC)	1.27
U mpp	1117 V		
I mpp	2068 A		

PV Array Characteristics

Array #32 - S2.9

Number of PV modules	4144 units	Number of inverters	1 unit
Nominal (STC)	2341 kWp	Total power	1995 kWac
Modules	148 Strings x 28 In series		
At operating cond. (50°C)		Operating voltage	910-1300 V
Pmpp	2136 kWp	Pnom ratio (DC:AC)	1.17
U mpp	1117 V		
I mpp	1913 A		

Array #35 - S3.3

Number of PV modules	4480 units	Number of inverters	1 unit
Nominal (STC)	2531 kWp	Total power	1995 kWac
Modules	160 Strings x 28 In series		
At operating cond. (50°C)		Operating voltage	910-1300 V
Pmpp	2309 kWp	Pnom ratio (DC:AC)	1.27
U mpp	1117 V		
I mpp	2068 A		

Array #36 - S3.4

Number of PV modules	4508 units	Number of inverters	1 unit
Nominal (STC)	2547 kWp	Total power	1995 kWac
Modules	161 Strings x 28 In series		
At operating cond. (50°C)		Operating voltage	910-1300 V
Pmpp	2324 kWp	Pnom ratio (DC:AC)	1.28
U mpp	1117 V		
I mpp	2081 A		

Array #37 - S3.5

Number of PV modules	4564 units	Number of inverters	1 unit
Nominal (STC)	2579 kWp	Total power	1995 kWac
Modules	163 Strings x 28 In series		
At operating cond. (50°C)		Operating voltage	910-1300 V
Pmpp	2353 kWp	Pnom ratio (DC:AC)	1.29
U mpp	1117 V		
I mpp	2107 A		

Array #38 - S3.6

Number of PV modules	4480 units	Number of inverters	1 unit
Nominal (STC)	2531 kWp	Total power	1995 kWac
Modules	160 Strings x 28 In series		
At operating cond. (50°C)		Operating voltage	910-1300 V
Pmpp	2309 kWp	Pnom ratio (DC:AC)	1.27
U mpp	1117 V		
I mpp	2068 A		

Array #39 - S3.7

Number of PV modules	4368 units	Number of inverters	1 unit
Nominal (STC)	2468 kWp	Total power	1995 kWac
Modules	156 Strings x 28 In series		
At operating cond. (50°C)		Operating voltage	910-1300 V
Pmpp	2252 kWp	Pnom ratio (DC:AC)	1.24
U mpp	1117 V		
I mpp	2017 A		

PV Array Characteristics

Array #40 - S3.8

Number of PV modules	4508 units	Number of inverters	1 unit
Nominal (STC)	2547 kWp	Total power	1995 kWac
Modules	161 Strings x 28 In series		
At operating cond. (50°C)		Operating voltage	910-1300 V
Pmpp	2324 kWp	Pnom ratio (DC:AC)	1.28
U mpp	1117 V		
I mpp	2081 A		

Array #41 - S3.9

Number of PV modules	4424 units	Number of inverters	1 unit
Nominal (STC)	2500 kWp	Total power	1995 kWac
Modules	158 Strings x 28 In series		
At operating cond. (50°C)		Operating voltage	910-1300 V
Pmpp	2281 kWp	Pnom ratio (DC:AC)	1.25
U mpp	1117 V		
I mpp	2042 A		

Array #42 - S3.10

Number of PV modules	4312 units	Number of inverters	1 unit
Nominal (STC)	2436 kWp	Total power	1995 kWac
Modules	154 Strings x 28 In series		
At operating cond. (50°C)		Operating voltage	910-1300 V
Pmpp	2223 kWp	Pnom ratio (DC:AC)	1.22
U mpp	1117 V		
I mpp	1991 A		

Array #43 - S4.1

Number of PV modules	4256 units	Number of inverters	1 unit
Nominal (STC)	2405 kWp	Total power	1995 kWac
Modules	152 Strings x 28 In series		
At operating cond. (50°C)		Operating voltage	910-1300 V
Pmpp	2194 kWp	Pnom ratio (DC:AC)	1.21
U mpp	1117 V		
I mpp	1965 A		

Array #44 - S4.2

Number of PV modules	4312 units	Number of inverters	1 unit
Nominal (STC)	2436 kWp	Total power	1995 kWac
Modules	154 Strings x 28 In series		
At operating cond. (50°C)		Operating voltage	910-1300 V
Pmpp	2223 kWp	Pnom ratio (DC:AC)	1.22
U mpp	1117 V		
I mpp	1991 A		

Array #45 - S4.3

Number of PV modules	4536 units	Number of inverters	1 unit
Nominal (STC)	2563 kWp	Total power	1995 kWac
Modules	162 Strings x 28 In series		
At operating cond. (50°C)		Operating voltage	910-1300 V
Pmpp	2338 kWp	Pnom ratio (DC:AC)	1.28
U mpp	1117 V		
I mpp	2094 A		

PV Array Characteristics

Array #46 - S4.4

Number of PV modules	4508 units	Number of inverters	1 unit
Nominal (STC)	2547 kWp	Total power	1995 kWac
Modules	161 Strings x 28 In series		
At operating cond. (50°C)		Operating voltage	910-1300 V
Pmpp	2324 kWp	Pnom ratio (DC:AC)	1.28
U mpp	1117 V		
I mpp	2081 A		

Array #47 - S4.5

Number of PV modules	4536 units	Number of inverters	1 unit
Nominal (STC)	2563 kWp	Total power	1995 kWac
Modules	162 Strings x 28 In series		
At operating cond. (50°C)		Operating voltage	910-1300 V
Pmpp	2338 kWp	Pnom ratio (DC:AC)	1.28
U mpp	1117 V		
I mpp	2094 A		

Array #48 - S4.6

Number of PV modules	4564 units	Number of inverters	1 unit
Nominal (STC)	2579 kWp	Total power	1995 kWac
Modules	163 Strings x 28 In series		
At operating cond. (50°C)		Operating voltage	910-1300 V
Pmpp	2353 kWp	Pnom ratio (DC:AC)	1.29
U mpp	1117 V		
I mpp	2107 A		

Array #50 - S4.8

Number of PV modules	4508 units	Number of inverters	1 unit
Nominal (STC)	2547 kWp	Total power	1995 kWac
Modules	161 Strings x 28 In series		
At operating cond. (50°C)		Operating voltage	910-1300 V
Pmpp	2324 kWp	Pnom ratio (DC:AC)	1.28
U mpp	1117 V		
I mpp	2081 A		

Array #51 - S4.9

Number of PV modules	4536 units	Number of inverters	1 unit
Nominal (STC)	2563 kWp	Total power	1995 kWac
Modules	162 Strings x 28 In series		
At operating cond. (50°C)		Operating voltage	910-1300 V
Pmpp	2338 kWp	Pnom ratio (DC:AC)	1.28
U mpp	1117 V		
I mpp	2094 A		

Array #52 - S4.10

Number of PV modules	4536 units	Number of inverters	1 unit
Nominal (STC)	2563 kWp	Total power	1995 kWac
Modules	162 Strings x 28 In series		
At operating cond. (50°C)		Operating voltage	910-1300 V
Pmpp	2338 kWp	Pnom ratio (DC:AC)	1.28
U mpp	1117 V		
I mpp	2094 A		

PV Array Characteristics

Array #53 - S4.11

Number of PV modules	4340 units	Number of inverters	1 unit
Nominal (STC)	2452 kWp	Total power	1995 kWac
Modules	155 Strings x 28 In series		
At operating cond. (50°C)		Operating voltage	910-1300 V
Pmpp	2237 kWp	Pnom ratio (DC:AC)	1.23
U mpp	1117 V		
I mpp	2004 A		

PV module

Manufacturer	Jinkosolar
Model	JKM565M-7RL4-V
(Custom parameters definition)	
Unit Nom. Power	565 Wp
Number of PV modules	26068 units
Nominal (STC)	14.73 MWp

Inverter

Manufacturer	Santerno
Model	SUNWAY TG 1800 1500V TE - 640 (1500 kVA)
(Custom parameters definition)	
Unit Nom. Power	1500 kWac
Number of inverters	8 units
Total power	12000 kWac

Array #4 - B4

Number of PV modules	3360 units	Number of inverters	1 unit
Nominal (STC)	1898 kWp	Total power	1500 kWac
Modules	120 Strings x 28 In series		
At operating cond. (50°C)		Operating voltage	910-1200 V
Pmpp	1732 kWp	Pnom ratio (DC:AC)	1.27
U mpp	1117 V		
I mpp	1551 A		

Array #5 - B5

Number of PV modules	3304 units	Number of inverters	1 unit
Nominal (STC)	1867 kWp	Total power	1500 kWac
Modules	118 Strings x 28 In series		
At operating cond. (50°C)		Operating voltage	910-1200 V
Pmpp	1703 kWp	Pnom ratio (DC:AC)	1.24
U mpp	1117 V		
I mpp	1525 A		

Array #6 - B6

Number of PV modules	3304 units	Number of inverters	1 unit
Nominal (STC)	1867 kWp	Total power	1500 kWac
Modules	118 Strings x 28 In series		
At operating cond. (50°C)		Operating voltage	910-1200 V
Pmpp	1703 kWp	Pnom ratio (DC:AC)	1.24
U mpp	1117 V		
I mpp	1525 A		

Array #8 - M1

Number of PV modules	3024 units	Number of inverters	1 unit
Nominal (STC)	1709 kWp	Total power	1500 kWac
Modules	108 Strings x 28 In series		
At operating cond. (50°C)		Operating voltage	910-1200 V
Pmpp	1559 kWp	Pnom ratio (DC:AC)	1.14
U mpp	1117 V		
I mpp	1396 A		

PV Array Characteristics

Array #21 - S1.2

Number of PV modules	3304 units	Number of inverters	1 unit
Nominal (STC)	1867 kWp	Total power	1500 kWac
Modules	118 Strings x 28 In series		
At operating cond. (50°C)		Operating voltage	910-1200 V
Pmpp	1703 kWp	Pnom ratio (DC:AC)	1.24
U mpp	1117 V		
I mpp	1525 A		

Array #22 - S1.3

Number of PV modules	3276 units	Number of inverters	1 unit
Nominal (STC)	1851 kWp	Total power	1500 kWac
Modules	117 Strings x 28 In series		
At operating cond. (50°C)		Operating voltage	910-1200 V
Pmpp	1689 kWp	Pnom ratio (DC:AC)	1.23
U mpp	1117 V		
I mpp	1512 A		

Array #23 - S1.4

Number of PV modules	3164 units	Number of inverters	1 unit
Nominal (STC)	1788 kWp	Total power	1500 kWac
Modules	113 Strings x 28 In series		
At operating cond. (50°C)		Operating voltage	910-1200 V
Pmpp	1631 kWp	Pnom ratio (DC:AC)	1.19
U mpp	1117 V		
I mpp	1461 A		

Array #34 - S3.2

Number of PV modules	3332 units	Number of inverters	1 unit
Nominal (STC)	1883 kWp	Total power	1500 kWac
Modules	119 Strings x 28 In series		
At operating cond. (50°C)		Operating voltage	910-1200 V
Pmpp	1718 kWp	Pnom ratio (DC:AC)	1.26
U mpp	1117 V		
I mpp	1538 A		

Array #7 - B7

PV module		**Inverter**	
Manufacturer	Jinkosolar	Manufacturer	Santerno
Model	JKM565M-7RL4-V	Model	SUNWAY TG 900 1500V TE - 600- cop 300
(Custom parameters definition)		(Custom parameters definition)	
Unit Nom. Power	565 Wp	Unit Nom. Power	300 kWac
Number of PV modules	644 units	Number of inverters	1 unit
Nominal (STC)	364 kWp	Total power	300 kWac
Modules	23 Strings x 28 In series	Operating voltage	850-1200 V
At operating cond. (50°C)		Pnom ratio (DC:AC)	1.21
Pmpp	332 kWp		
U mpp	1117 V		
I mpp	297 A		

PV module		**Inverter**	
Manufacturer	Jinkosolar	Manufacturer	Santerno
Model	JKM565M-7RL4-V	Model	Sunway TG 900 1500V TE - 640 EV
(Custom parameters definition)		(Original PVsyst database)	
Unit Nom. Power	565 Wp	Unit Nom. Power	998 kWac
Number of PV modules	8820 units	Number of inverters	4 units
Nominal (STC)	4983 kWp	Total power	3992 kWac

PV Array Characteristics

Array #13 - M6

Number of PV modules	2184 units	Number of inverters	1 unit
Nominal (STC)	1234 kWp	Total power	998 kWac
Modules	78 Strings x 28 In series		
At operating cond. (50°C)		Operating voltage	910-1300 V
Pmpp	1126 kWp	Pnom ratio (DC:AC)	1.24
U mpp	1117 V		
I mpp	1008 A		

Array #24 - S2.1

Number of PV modules	2184 units	Number of inverters	1 unit
Nominal (STC)	1234 kWp	Total power	998 kWac
Modules	78 Strings x 28 In series		
At operating cond. (50°C)		Operating voltage	910-1300 V
Pmpp	1126 kWp	Pnom ratio (DC:AC)	1.24
U mpp	1117 V		
I mpp	1008 A		

Array #33 - S3.1

Number of PV modules	2268 units	Number of inverters	1 unit
Nominal (STC)	1281 kWp	Total power	998 kWac
Modules	81 Strings x 28 In series		
At operating cond. (50°C)		Operating voltage	910-1300 V
Pmpp	1169 kWp	Pnom ratio (DC:AC)	1.28
U mpp	1117 V		
I mpp	1047 A		

Array #49 - S4.7

Number of PV modules	2184 units	Number of inverters	1 unit
Nominal (STC)	1234 kWp	Total power	998 kWac
Modules	78 Strings x 28 In series		
At operating cond. (50°C)		Operating voltage	910-1300 V
Pmpp	1126 kWp	Pnom ratio (DC:AC)	1.24
U mpp	1117 V		
I mpp	1008 A		

Total PV power

Nominal (STC)	121023 kWp
Total	214200 modules
Module area	585639 m²

Total inverter power

Total power	96092 kWac
Nb. of inverters	53 units
Pnom ratio	1.26

Array losses

Array Soiling Losses
Loss Fraction 3.0 %

Thermal Loss factor
Module temperature according to irradiance
Uc (const) 29.0 W/m²K
Uv (wind) 0.0 W/m²K/m/s

Serie Diode Loss
Voltage drop 0.7 V
Loss Fraction 0.1 % at STC

LID - Light Induced Degradation
Loss Fraction 2.0 %

Module Quality Loss
Loss Fraction -0.8 %

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

DC wiring losses

Global wiring resistance 0.19 mΩ
Loss Fraction 1.5 % at STC

Array #1 - B1
Global array res. 9.2 mΩ
Loss Fraction 1.5 % at STC

Array #2 - B2
Global array res. 9.1 mΩ
Loss Fraction 1.5 % at STC

Array #3 - B3
Global array res. 9.1 mΩ
Loss Fraction 1.5 % at STC

Array #4 - B4
Global array res. 12 mΩ
Loss Fraction 1.5 % at STC

Array #5 - B5
Global array res. 12 mΩ
Loss Fraction 1.5 % at STC

Array #6 - B6
Global array res. 12 mΩ
Loss Fraction 1.5 % at STC

Array #7 - B7
Global array res. 62 mΩ
Loss Fraction 1.5 % at STC

Array #8 - M1
Global array res. 13 mΩ
Loss Fraction 1.5 % at STC

Array #9 - M2
Global array res. 8.8 mΩ
Loss Fraction 1.5 % at STC

Array #10 - M3
Global array res. 8.8 mΩ
Loss Fraction 1.5 % at STC

Array #11 - M4
Global array res. 8.8 mΩ
Loss Fraction 1.5 % at STC

Array #12 - M5
Global array res. 8.9 mΩ
Loss Fraction 1.5 % at STC

Array #13 - M6
Global array res. 18 mΩ
Loss Fraction 1.5 % at STC

Array #14 - P1
Global array res. 9.9 mΩ
Loss Fraction 1.5 % at STC

Array #15 - P2
Global array res. 8.3 mΩ
Loss Fraction 1.5 % at STC

Array #16 - P3
Global array res. 8.8 mΩ
Loss Fraction 1.5 % at STC

Array #17 - P4
Global array res. 8.9 mΩ
Loss Fraction 1.5 % at STC

Array #18 - P5
Global array res. 8.9 mΩ
Loss Fraction 1.5 % at STC

Array #19 - P6
Global array res. 8.7 mΩ
Loss Fraction 1.5 % at STC

Array #20 - S1.1
Global array res. 8.9 mΩ
Loss Fraction 1.5 % at STC

Array #21 - S1.2
Global array res. 12 mΩ
Loss Fraction 1.5 % at STC

Array #22 - S1.3
Global array res. 12 mΩ
Loss Fraction 1.5 % at STC

DC wiring losses

Array #23 - S1.4		**Array #24 - S2.1**	
Global array res.	13 mΩ	Global array res.	18 mΩ
Loss Fraction	1.5 % at STC	Loss Fraction	1.5 % at STC
Array #25 - S2.2		**Array #26 - S2.3**	
Global array res.	8.8 mΩ	Global array res.	8.9 mΩ
Loss Fraction	1.5 % at STC	Loss Fraction	1.5 % at STC
Array #27 - S2.4		**Array #28 - S2.5**	
Global array res.	8.8 mΩ	Global array res.	8.8 mΩ
Loss Fraction	1.5 % at STC	Loss Fraction	1.5 % at STC
Array #29 - S2.6		**Array #30 - S2.7**	
Global array res.	8.8 mΩ	Global array res.	9.2 mΩ
Loss Fraction	1.5 % at STC	Loss Fraction	1.5 % at STC
Array #31 - S2.8		**Array #32 - S2.9**	
Global array res.	8.9 mΩ	Global array res.	9.6 mΩ
Loss Fraction	1.5 % at STC	Loss Fraction	1.5 % at STC
Array #33 - S3.1		**Array #34 - S3.2**	
Global array res.	18 mΩ	Global array res.	12 mΩ
Loss Fraction	1.5 % at STC	Loss Fraction	1.5 % at STC
Array #35 - S3.3		**Array #36 - S3.4**	
Global array res.	8.9 mΩ	Global array res.	8.9 mΩ
Loss Fraction	1.5 % at STC	Loss Fraction	1.5 % at STC
Array #37 - S3.5		**Array #38 - S3.6**	
Global array res.	8.8 mΩ	Global array res.	8.9 mΩ
Loss Fraction	1.5 % at STC	Loss Fraction	1.5 % at STC
Array #39 - S3.7		**Array #40 - S3.8**	
Global array res.	9.2 mΩ	Global array res.	8.9 mΩ
Loss Fraction	1.5 % at STC	Loss Fraction	1.5 % at STC
Array #41 - S3.9		**Array #42 - S3.10**	
Global array res.	9.0 mΩ	Global array res.	9.3 mΩ
Loss Fraction	1.5 % at STC	Loss Fraction	1.5 % at STC
Array #43 - S4.1		**Array #44 - S4.2**	
Global array res.	9.4 mΩ	Global array res.	9.3 mΩ
Loss Fraction	1.5 % at STC	Loss Fraction	1.5 % at STC
Array #45 - S4.3		**Array #46 - S4.4**	
Global array res.	8.8 mΩ	Global array res.	8.9 mΩ
Loss Fraction	1.5 % at STC	Loss Fraction	1.5 % at STC
Array #47 - S4.5		**Array #48 - S4.6**	
Global array res.	8.8 mΩ	Global array res.	8.8 mΩ
Loss Fraction	1.5 % at STC	Loss Fraction	1.5 % at STC
Array #49 - S4.7		**Array #50 - S4.8**	
Global array res.	18 mΩ	Global array res.	8.9 mΩ
Loss Fraction	1.5 % at STC	Loss Fraction	1.5 % at STC
Array #51 - S4.9		**Array #52 - S4.10**	
Global array res.	8.8 mΩ	Global array res.	8.8 mΩ
Loss Fraction	1.5 % at STC	Loss Fraction	1.5 % at STC
Array #53 - S4.11			
Global array res.	9.2 mΩ		
Loss Fraction	1.5 % at STC		

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System losses

Unavailability of the system

Time fraction	0.5 %
	1.8 days,
	3 periods

AC wiring losses

Inv. output line up to MV transfo

Inverter voltage	640 Vac tri
Loss Fraction	2.73 % at STC

Global System

Wire section	Copper 3 x 100000 mm²
Wires length	500 m

MV line up to Injection

MV Voltage	30 kV
Average each inverter	
Wires	Copper 3 x 2500 mm²
Length	300 m
Loss Fraction	0.00 % at STC

AC losses in transformers

MV transfo

Grid voltage	30 kV

Operating losses at STC

Nominal power at STC	119171 kVA
Iron loss (24/24 Connexion)	2.25 kW/Inv.
Loss Fraction	0.10 % at STC
Coils equivalent resistance	3 x 1.82 mΩ/inv.
Loss Fraction	1.00 % at STC

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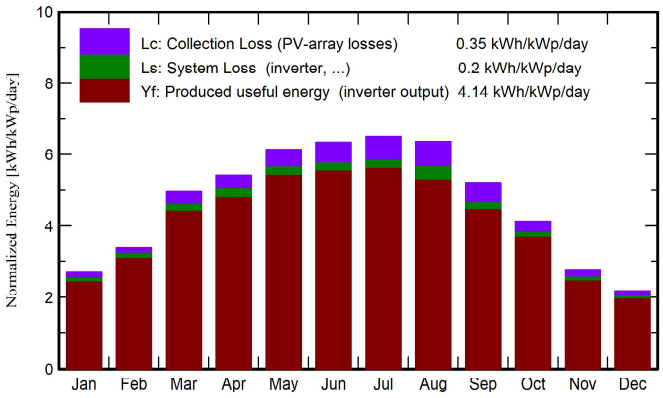
Main results

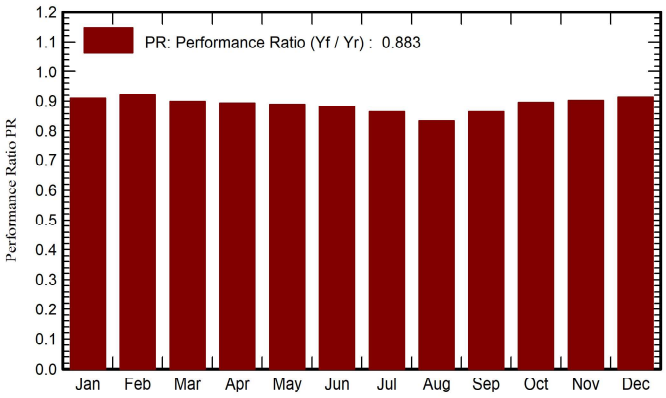
System Production

Produced Energy	182975 MWh/year	Specific production	1512 kWh/kWp/year
		Performance Ratio PR	88.35 %

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 MWh	E_Grid MWh	PR ratio
January	51.6	23.46	8.00	84.5	80.7	9731	9310	0.910
February	67.7	34.40	8.50	95.2	90.9	11071	10615	0.921
March	122.7	56.82	11.50	153.9	147.0	17469	16748	0.899
April	148.2	73.99	14.45	162.6	154.8	18512	17584	0.894
May	190.5	85.05	19.83	190.3	181.3	21357	20485	0.889
June	197.5	85.13	24.75	189.7	180.7	21091	20239	0.882
July	206.4	79.37	27.62	202.0	192.5	22073	21170	0.866
August	184.0	72.44	27.32	197.7	188.5	21398	19951	0.834
September	131.6	56.96	21.84	156.2	148.8	17079	16376	0.866
October	94.5	45.50	17.89	128.4	122.7	14526	13924	0.896
November	55.1	28.76	12.81	83.2	79.4	9492	9091	0.903
December	42.7	25.18	9.16	67.7	64.5	7808	7482	0.913
Year	1492.4	667.08	17.03	1711.3	1631.9	191608	182975	0.883

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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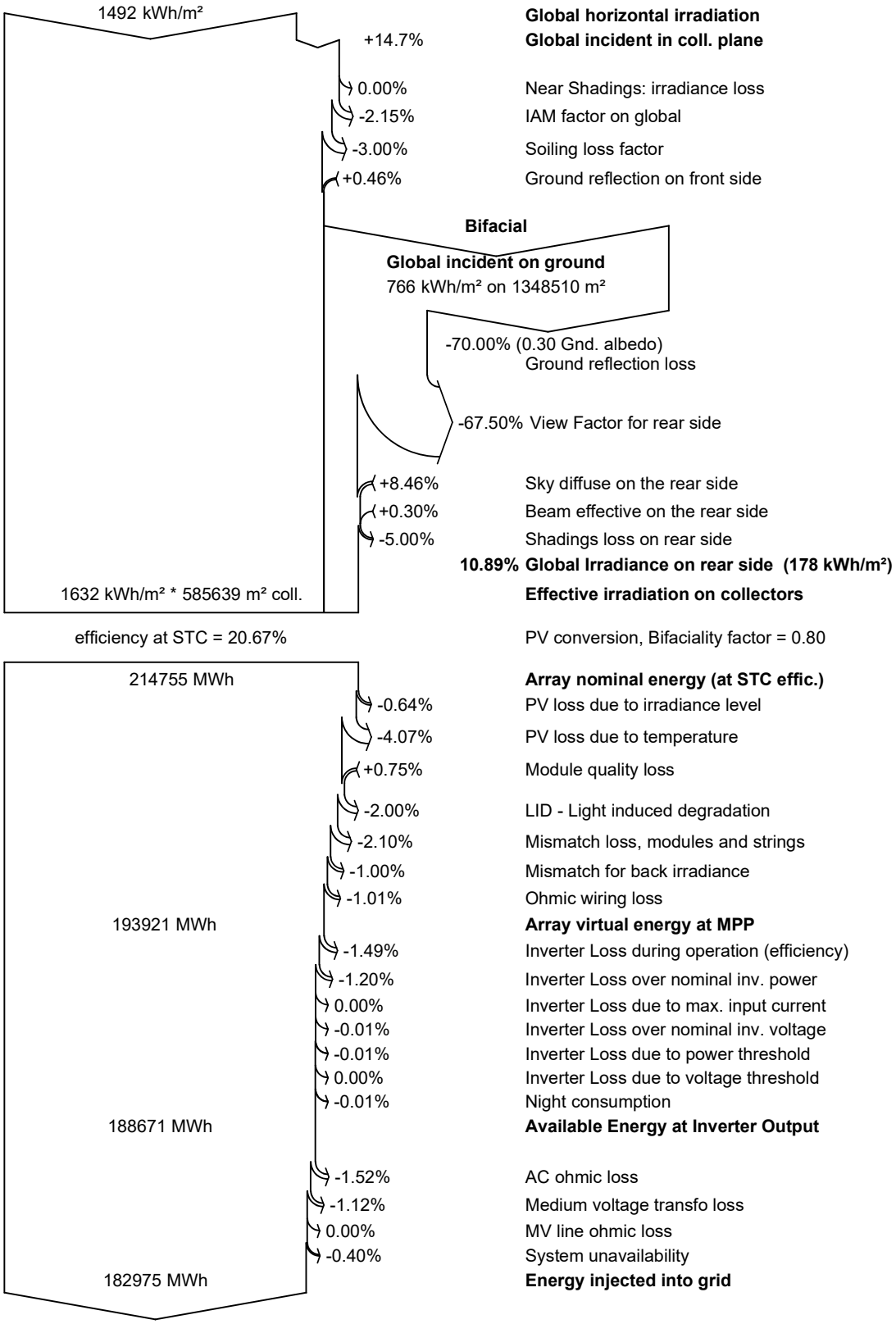
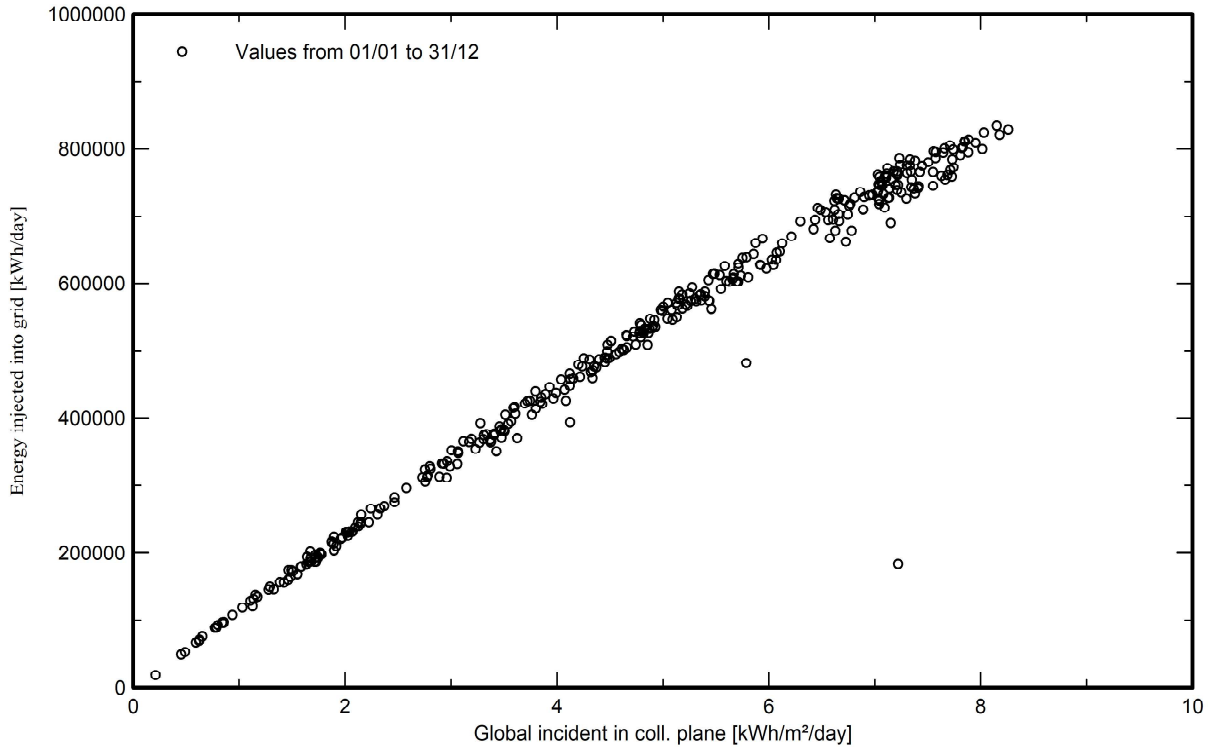
Loss diagram



Special graphs

Diagramma giornaliero entrata/uscita



Distribuzione potenza in uscita sistema