Grid-Connected System: Simulation parameters

Project : **Grid-Connected Project at Montemor-o-Novo_Sagim**

Geographical Site	**Montemor-o-Novo_Sagim**		Country	**Portugal**
Situation	Latitude	38.7°N	Longitude	8.2°W
Time defined as	Legal Time	Time zone UT	Altitude	241 m
	Albedo	0.20		
Meteo data:	**Montemor-o-Novo_Sagim**	Synthetic - Meteonorm 6.1		

Simulation variant : **New simulation variant**

Simulation date 05/05/15 21h56

Simulation parameters

Collector Plane Orientation	Tilt	30°	Azimuth	0°
Models used	Transposition	Perez	Diffuse	Measured
Horizon	Free Horizon			
Near Shadings	No Shadings			

PV Array Characteristics

PV module	Si-poly	Model	**REC 250PE**	
		Manufacturer	REC	
Number of PV modules		In series	19 modules	In parallel 3 strings
Total number of PV modules		Nb. modules	57	Unit Nom. Power 250 Wp
Array global power		Nominal (STC)	**14.25 kWp**	At operating cond. 12.85 kWp (50°C)
Array operating characteristics (50°C)		U mpp	518 V	I mpp 25 A
Total area		Module area	**94.1 m²**	Cell area 83.2 m²

Inverter		Model	**Sunny Tripower15000 TLEE**	
		Manufacturer	SMA	
Characteristics		Operating Voltage	580-800 V	Unit Nom. Power 15.0 kW AC

PV Array loss factors

Array Soiling Losses			Loss Fraction	1.0 %
Thermal Loss factor	Uc (const)	29.0 W/m²K	Uv (wind)	0.0 W/m²K / m/s
Wiring Ohmic Loss	Global array res.	147 mOhm	Loss Fraction	0.6 % at STC
Module Quality Loss			Loss Fraction	-0.8 %
Module Mismatch Losses			Loss Fraction	1.0 % at MPP
Incidence effect, ASHRAE parametrization	IAM =	1 - bo (1/cos i - 1)	bo Param.	0.05

System loss factors

Wiring Ohmic Loss	Wires	20 m 3x6 mm²	Loss Fraction	0.6 % at STC

User's needs : Ext. defined as file Consumos monte.csv

Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Year	
3287	4030	4921	3676	2822	3246	3213	3275	2529	3067	3236	4146	41448	kWh

Grid-Connected System: Main results

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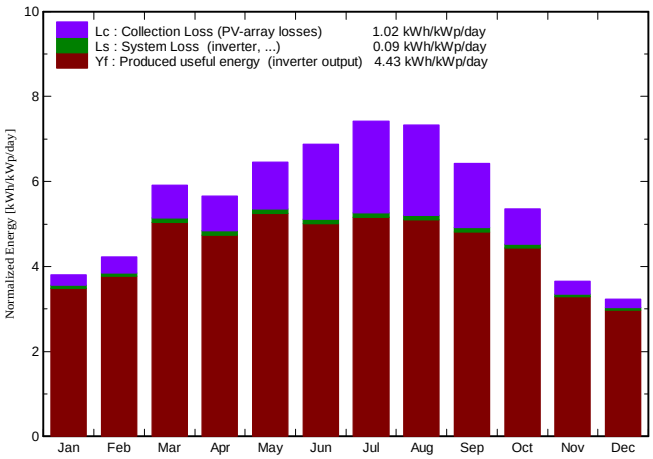
Main system parameters	System type	**Grid-Connected**		
PV Field Orientation	tilt	30°	azimuth	0°
PV modules	Model	REC 250PE	Pnom	250 Wp
PV Array	Nb. of modules	57	Pnom total	**14.25 kWp**
Inverter	Model	Sunny Tripower15000 TLEE	Pnom	15.00 kW ac
User's needs	Ext. defined as file	Consumos monte.csv	global	41.4 MWh/year

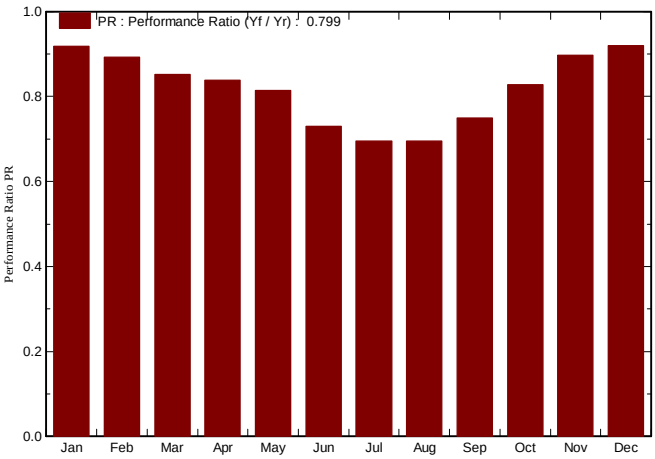
Main simulation results

System Production	**Produced Energy**	**23.03 MWh/year**	Specific prod.	1616 kWh/kWp/year
	Performance Ratio PR	79.9 %	Solar Fraction SF	37.8 %

Normalized productions (per installed kWp): Nominal power 14.25 kWp



Performance Ratio PR



New simulation variant

Balances and main results

	GlobHor kWh/m²	T Amb °C	GlobInc kWh/m²	GlobEff kWh/m²	EArray MWh	E Load MWh	E User MWh	E_Grid MWh
January	73.0	8.94	117.8	113.4	1.574	3.287	1.064	0.478
February	83.5	10.30	118.4	114.0	1.537	4.030	1.178	0.327
March	147.0	13.08	183.5	176.8	2.273	4.921	1.789	0.437
April	157.1	13.98	169.8	162.8	2.072	3.676	1.434	0.593
May	203.4	17.13	199.9	191.2	2.369	2.822	1.263	1.056
June	220.6	21.97	206.2	196.9	2.189	3.246	1.595	0.547
July	239.6	23.73	229.9	220.4	2.326	3.213	1.497	0.780
August	216.3	23.94	227.4	218.5	2.297	3.275	1.529	0.721
September	161.4	21.12	192.8	185.9	2.104	2.529	1.092	0.968
October	119.2	16.98	166.2	160.2	2.001	3.067	1.149	0.812
November	71.3	11.93	109.8	105.6	1.434	3.236	0.992	0.413
December	60.7	9.73	100.2	96.3	1.339	4.146	1.099	0.213
Year	1753.1	16.10	2021.7	1942.0	23.515	41.448	15.683	7.345

Legends:	GlobHor	Horizontal global irradiation	EArray	Effective energy at the output of the array
	T Amb	Ambient Temperature	E Load	Energy need of the user (Load)
	GlobInc	Global incident in coll. plane	E User	Energy supplied to the user
	GlobEff	Effective Global, corr. for IAM and shadings	E_Grid	Energy injected into grid

Grid-Connected System: Loss diagram

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Loss diagram over the whole year