

Grid-Connected System: Simulation parameters

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

Geographical Site **Montemor-o-Novo_Sagim** **Country** **Portugal**

Situation Latitude 38.6°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 16/12/14 17h00

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 245PE**
 Manufacturer REC
 Number of PV modules In series 22 modules In parallel 2 strings
 Total number of PV modules Nb. modules 44 Unit Nom. Power 245 Wp
 Array global power Nominal (STC) **10.78 kWp** At operating cond. 9.81 kWp (50°C)
 Array operating characteristics (50°C) U mpp 595 V I mpp 16 A
 Total area Module area **72.6 m²** Cell area 64.2 m²

Inverter Model **Fronius Symo 10.0-3-M**
 Manufacturer Fronius International GmbH
 Characteristics Operating Voltage 200-800 V Unit Nom. Power 10.0 kW AC

PV Array loss factors

Array Soiling Losses Loss Fraction 1.0 %
 Thermal Loss factor U_c (const) 29.0 W/m²K U_v (wind) 0.0 W/m²K / m/s
 Wiring Ohmic Loss Global array res. 165 mOhm Loss Fraction 0.4 % 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 1.7 % 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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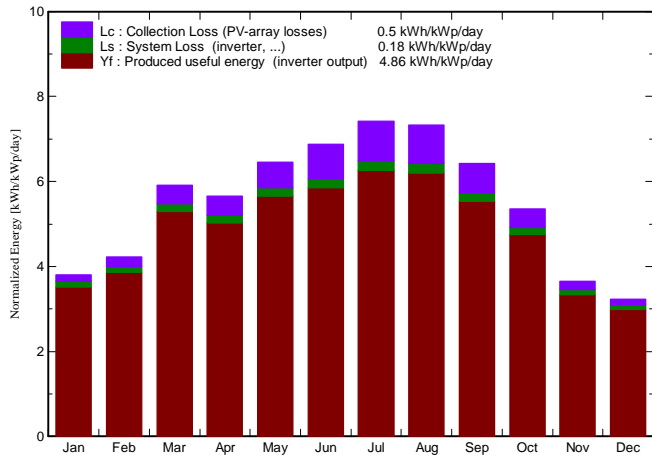
Simulation variant : **New simulation variant**

Main system parameters		System type	Grid-Connected		
PV Field Orientation		tilt	30°	azimuth	0°
PV modules		Model	REC 245PE	Pnom	245 Wp
PV Array		Nb. of modules	44	Pnom total	10.78 kWp
Inverter		Model	Fronius Symo 10.0-3-M	Pnom	10.00 kW ac
User's needs		Ext. defined as file	Consumos monte.csv	global	41.4 MWh/year

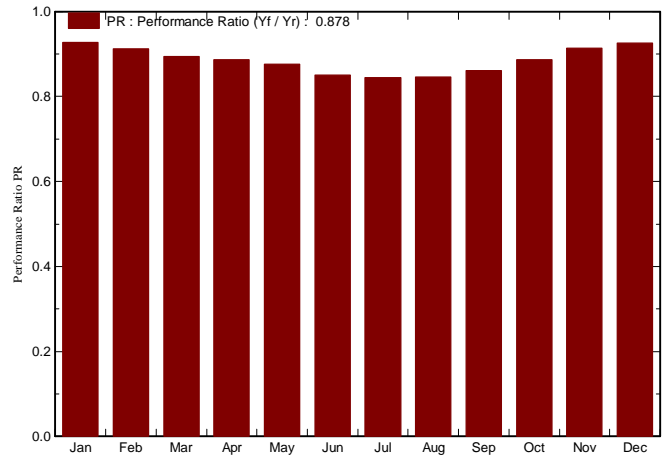
Main simulation results

System Production	Produced Energy	19.13 MWh/year	Specific prod.	1775 kWh/kWp/year
	Performance Ratio PR	87.8 %	Solar Fraction SF	35.0 %

Normalized productions (per installed kWp): Nominal power 10.78 kWp



Performance Ratio PR



**New simulation variant
Balances and main results**

	GlobHor	T Amb	GlobInc	GlobEff	EArray	E Load	E User	E_Grid
	kWh/m ²	°C	kWh/m ²	kWh/m ²	MWh	MWh	MWh	MWh
January	73.0	8.94	117.8	113.4	1.219	3.287	0.970	0.207
February	83.5	10.30	118.4	114.0	1.207	4.030	1.043	0.122
March	147.0	13.08	183.5	176.8	1.831	4.921	1.598	0.170
April	157.1	13.98	169.8	162.8	1.682	3.676	1.307	0.315
May	203.4	17.13	199.9	191.2	1.957	2.822	1.191	0.697
June	220.6	21.97	206.2	196.9	1.960	3.246	1.512	0.379
July	239.6	23.73	229.9	220.4	2.167	3.213	1.444	0.647
August	216.3	23.94	227.4	218.5	2.146	3.275	1.469	0.602
September	161.4	21.12	192.8	185.9	1.856	2.529	1.046	0.745
October	119.2	16.98	166.2	160.2	1.644	3.067	1.076	0.512
November	71.3	11.93	109.8	105.6	1.120	3.236	0.892	0.189
December	60.7	9.73	100.2	96.3	1.035	4.146	0.938	0.061
Year	1753.1	16.10	2021.7	1942.0	19.824	41.448	14.487	4.646

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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Inverter	Model	Fronius Symo 10.0-3-M	Pnom 10.00 kW ac
User's needs	Ext. defined as file	Consumos monte.csv	global 41.4 MWh/year

Loss diagram over the whole year

