

24V@555 Ah - Potencia módulo 1000 Wp
Energía media diaria: 3000 Wh/día. (Max: 5825 Wh - Min.: 1925 Wh)

Stand Alone System: Simulation parameters

Project : **24V; P=1000 Wp - MADRID**

Geographical Site **Madrid** **Country** **Spain**

Situation Latitude 40.5°N Longitude 3.5°W
 Time defined as Legal Time Time zone UT+1 Altitude 582 m
 Albedo 0.20

Meteo data : Madrid, Synthetic Hourly data

Simulation variant : **New simulation variant**

Simulation date 24/08/17 17h18

Simulation parameters

Collector Plane Orientation Tilt 30° Azimuth 0°

PV Array Characteristics

PV module Si-poly Model **REC 250PE**
 Manufacturer REC
 Number of PV modules In series 2 modules In parallel 2 strings
 Total number of PV modules Nb. modules 4 Unit Nom. Power 250 Wp
 Array global power Nominal (STC) **1000 Wp** At operating cond. 889 Wp (50°C)
 Array operating characteristics (50°C) U mpp 54 V I mpp 16 A
 Total area Module area **6.6 m²** Cell area 5.8 m²

PV Array loss factors

Thermal Loss factor U_c (const) 20.0 W/m²K U_v (wind) 0.0 W/m²K / m/s
 => Nominal Oper. Coll. Temp. (G=800 W/m², Tamb=20°C, Wind=1 m/s.) NOCT 56 °C
 Wiring Ohmic Loss Global array res. 56 mOhm Loss Fraction 1.5 % at STC
 Module Quality Loss Loss Fraction 3.0 %
 Module Mismatch Losses Loss Fraction 2.0 % at MPP
 Incidence effect, ASHRAE parametrization IAM = 1 - bo (1/cos i - 1) bo Parameter 0.05

System Parameter

System type **Stand Alone System**

Battery

Model **6-CS-21PS**

Battery Pack Characteristics

Manufacturer Rolls
 Voltage 24 V Nominal Capacity 567 Ah
 Nb. of units 4 in series
 Temperature Fixed (20°C)

Regulator

Model Generic Default with MPPT converter

Converter

Technology MPPT converter Temp coeff. -5.0 mV/°C/elem.

Battery Management Thresholds

Maxi and EURO efficiencies 96.0/94.0 %
 Charging 27.0/26.2 V Discharging 23.5/25.2 V
 Back-Up Genset Command 23.6/25.8 V

User's needs :

Daily household consumers average Constant over the year
 3.0 kWh/Day

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Stand Alone System: Detailed User's needs

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Simulation variant : New simulation variant

Main system parameters	System type	Stand alone		
PV Field Orientation	tilt	30°	azimuth	0°
PV Array	Nb. of modules	4	Pnom total	1000 Wp
Battery	Model	6-CS-21PS	Technology	sealed, plates
battery Pack	Nb. of units	4	Voltage / Capacity	24 V / 567 Ah
User's needs	Daily household consumers	Constant over the year	global	1097 kWh/year

Daily household consumers, Constant over the year, average = 3.0 kWh/day

Annual values

	Number	Power	Use	Energy
Fluorescent lamps	6	18 W/lamp	5 h/day	540 Wh/day
TV / Video-tape rec. / PC	1	75 W/app	3 h/day	225 Wh/day
Domestic appliances	1	250 W/app	2 h/day	500 Wh/day
Fridge / Deep-freeze	1		500 Wh/day	500 Wh/day
Dish-washer / Cloth-washer	1		1000 Wh/day	1000 Wh/day
Stand-by consumers		10 W tot	24 h/day	240 Wh/day
Total daily energy				3005 Wh/day

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Stand Alone System: Main results

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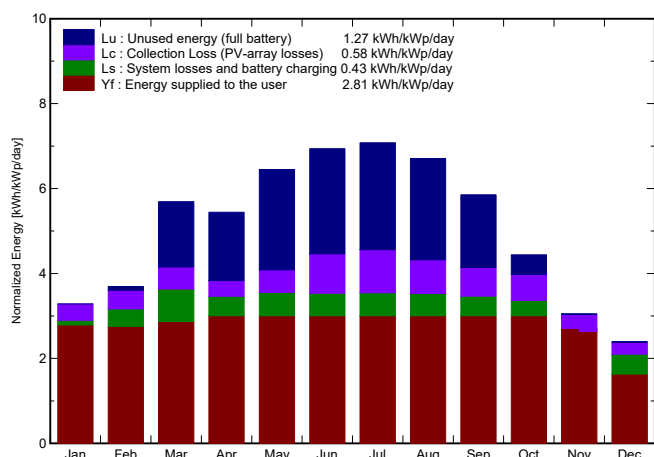
Simulation variant : New simulation variant

Main system parameters	System type	Stand alone
PV Field Orientation	tilt	30°
PV Array	Nb. of modules	4
Battery	Model	6-CS-21PS
battery Pack	Nb. of units	4
User's needs	Daily household consumers	Constant over the year
	azimuth	0°
	Pnom total	1000 Wp
	Technology	sealed, plates
	Voltage / Capacity	24 V / 567 Ah
	global	1097 kWh/year

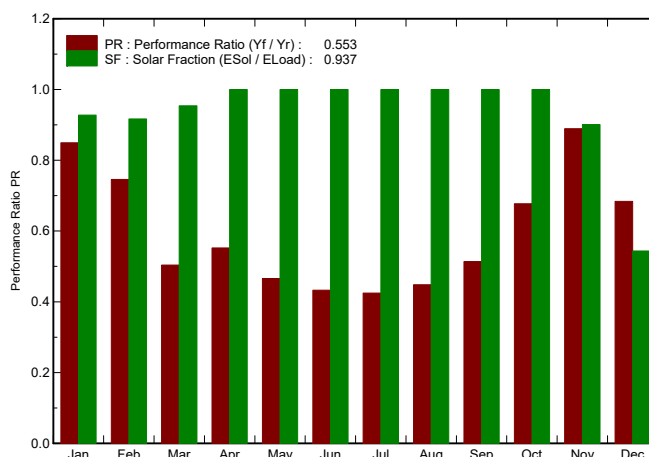
Main simulation results

System Production	Available Energy	1571 kWh/year	Specific prod.	1571 kWh/kWp/year
	Used Energy	1027 kWh/year	Excess (unused)	464 kWh/year
Loss of Load	Performance Ratio PR	55.3 %	Solar Fraction SF	93.7 %
	Time Fraction	6.3 %	Missing Energy	69 kWh/year

Normalized productions (per installed kWp): Nominal power 1000 Wp



Performance Ratio PR and Solar Fraction SF



New simulation variant
Balances and main results

	GlobHor kWh/m²	GlobEff kWh/m²	E Avail kWh	EUnused kWh	E Miss kWh	E User kWh	E Load kWh	SolFrac
January	66.0	98.7	84.7	0.04	6.72	86.43	93.15	0.928
February	77.0	100.4	85.6	2.51	7.02	77.12	84.14	0.917
March	141.0	171.4	153.9	47.57	4.30	88.85	93.15	0.954
April	153.0	158.4	145.7	48.24	0.00	90.15	90.15	1.000
May	204.0	194.0	176.5	73.29	0.00	93.15	93.15	1.000
June	223.0	201.8	173.4	74.27	0.00	90.15	90.15	1.000
July	230.0	212.7	180.6	78.10	0.00	93.15	93.15	1.000
August	201.0	201.8	176.2	73.95	0.00	93.15	93.15	1.000
September	150.0	170.5	148.6	51.29	0.00	90.15	90.15	1.000
October	105.0	133.7	112.6	14.37	0.00	93.15	93.15	1.000
November	64.0	88.6	73.5	0.08	8.92	81.23	90.15	0.901
December	49.0	71.7	59.7	0.08	42.52	50.64	93.15	0.544
Year	1663.0	1803.7	1571.1	463.79	69.48	1027.35	1096.82	0.937

Legends: GlobHor Horizontal global irradiation
 GlobEff Effective Global, corr. for IAM and shadings
 E Avail Available Solar Energy
 EUnused Unused energy (full battery) loss
 E Miss Missing energy
 E User Energy supplied to the user
 E Load Energy need of the user (Load)
 SolFrac Solar fraction (EUsed / ELoad)

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Stand Alone System: Loss diagram

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Loss diagram over the whole year

