

Test lampione 30W - 5gg nosun - FV 100W - Batteria 65A  
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## Stand Alone System: Simulation parameters

**Project :** **Lampione 30W**

**Geographical Site** **Milano** **Country** **Italy**  
**Situation** Latitude 45.3°N Longitude 9.2°E  
Time defined as Legal Time Time zone UT+1 Altitude 122 m  
Albedo 0.20

**Meteo data :** Milano , synthetic hourly data

**Simulation Variant :** **lampione 30W**

Simulation date 15/01/10 16h07

### Simulation parameters

**Collector Plane Orientation** Tilt 55° Azimuth 0°

### PV Array Characteristics

**PV module** Si-mono Model **SYM100M**  
Manufacturer SUNERGY  
Number of PV modules In series 1 modules In parallel 1 strings  
Total number of PV modules Nb. modules 1 Unit Nom. Power 100 Wp  
Array global power Nominal (STC) **100 Wp** At operating cond. 89 Wp (50°C)  
Array operating characteristics (50°C) U mpp 17 V I mpp 5 A  
Total area Module area **1.0 m<sup>2</sup>** Cell area 0.9 m<sup>2</sup>

### PV Array loss factors

Heat Loss Factor ko (const) 29.0 W/m<sup>2</sup>K kv (wind) 0.0 W/m<sup>2</sup>K / m/s  
=> Nominal Oper. Coll. Temp. (800 W/m<sup>2</sup>, Tamb=20°C, wind 1 m/s) NOCT 45 °C  
Wiring Ohmic Loss Global array res. 224.1 mOhm Loss Fraction 6.7 % at STC  
Serie Diode Loss Voltage Drop 0.7 V Loss Fraction 4.0 % at STC  
Module Quality Loss Loss Fraction 3.0 %  
Module Mismatch Losses Loss Fraction 4.0 % (fixed voltage)  
Incidence effect, ASHRAE parametrization IAM = 1-bo (1/cos i - 1) bo Parameter 0.05

**System Parameter** System type **Stand Alone System**

**Battery** Model **Compact Power**  
Manufacturer Oerlikon  
Battery Pack Characteristics Voltage 12 V Nominal Capacity 65 Ah  
Nb. of units 1  
Temperature Fixed (20°C)

**Regulator** Model General Purpose Default  
Technology Undefined Temp coeff. -5.0 mV/°C/elem.  
Battery Management Thresholds Charging 13.5/13.1 V Discharging 11.8/12.6 V  
Back-Up Genset Command 11.8/12.9 V

**User's needs :** Daily household consumers Constant over the year  
average 0.1 kWh/Day

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## Stand Alone System: Detailed User's needs

**Project :** Lampione 30W

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<b>Main system parameters</b>	System type	<b>Stand alone</b>		
PV Field Orientation	tilt	55°	azimuth	0°
PV modules	Model	SYM100M	Pnom	100 Wp
PV Array	Nb. of modules	1	Pnom total	<b>100 Wp</b>
Battery	Model	Compact Power	Voltage / Capacity	12 V / 65 Ah
User's needs	Daily household consumers	Constant over the year	global	44 kWh/year

**Daily household consumers, Constant over the year, average = 0.1 kWh/day**

### Annual values

	Number	Power	Use	Energy
Fluorescent lamps	1	5 W/lamp	24 h/day	120 Wh/day
Total daily energy				120 Wh/day

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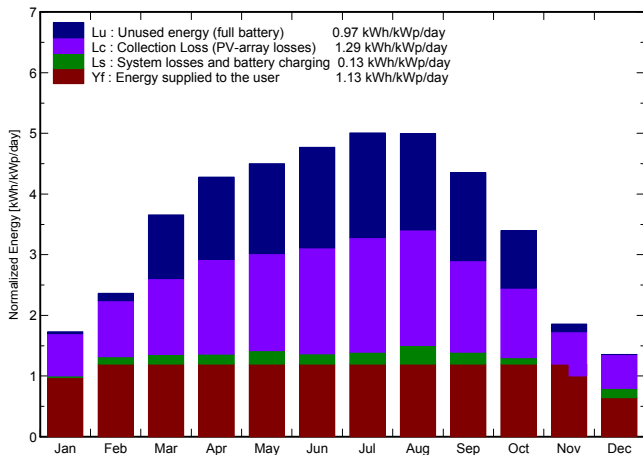
Stand Alone System: Main results

**Project :** Lampione 30W  
**Simulation Variant :** lampione 30W

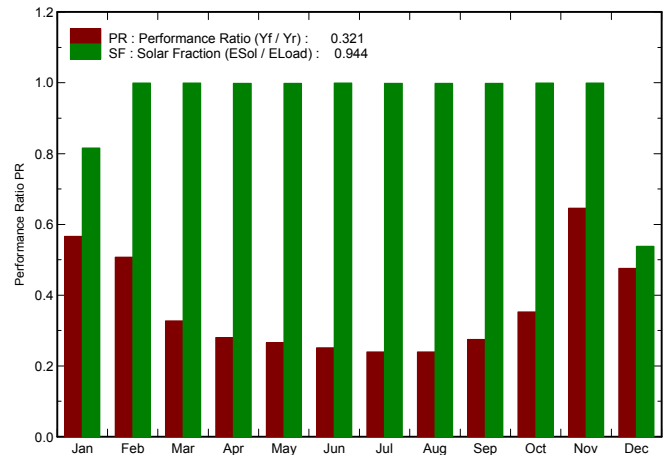
<b>Main system parameters</b>	System type	<b>Stand alone</b>
PV Field Orientation	tilt	55° azimuth 0°
PV modules	Model	SYM100M Pnom 100 Wp
PV Array	Nb. of modules	1 Pnom total <b>100 Wp</b>
Battery	Model	Compact PowerVoltage / Capacity 12 V / 65 Ah
User's needs	Daily household consumers	Constant over the year global 44 kWh/year

<b>Main simulation results</b>				
System Production	<b>Available Energy</b>	<b>82 kWh/year</b>	Specific	816 kWh/kWp/year
	Used Energy	41 kWh/year	Excess (unused)	35.3 kWh/year
	Performance Ratio PR	32.1 %	Solar Fraction SF	94.4 %
Loss of Load	Time Fraction	10.4 %	Missing Energy	2.4 kWh

Normalized productions (per installed kWp): Nominal power 100 Wp



Performance Ratio PR and Solar Fraction SF



**lampione 30W**  
**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	33.0	52.3	3.198	0.091	0.686	3.034	3.720	0.816
February	50.0	64.3	4.037	0.344	0.000	3.360	3.360	1.000
March	96.0	110.1	7.462	3.254	0.003	3.717	3.720	0.999
April	129.0	124.1	8.147	4.065	0.004	3.596	3.600	0.999
May	162.0	134.4	9.007	4.608	0.004	3.716	3.720	0.999
June	179.0	137.5	9.074	4.975	0.003	3.597	3.600	0.999
July	188.0	149.3	9.665	5.344	0.004	3.716	3.720	0.999
August	164.0	149.7	9.587	4.920	0.005	3.715	3.720	0.999
September	117.0	126.6	8.535	4.360	0.004	3.596	3.600	0.999
October	73.0	102.6	6.992	2.950	0.002	3.718	3.720	0.999
November	36.0	54.4	3.402	0.390	0.000	3.600	3.600	1.000
December	28.0	41.0	2.479	0.010	1.719	2.001	3.720	0.538
Year	1255.0	1246.5	81.583	35.312	2.435	41.365	43.800	0.944

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

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### Stand Alone System: Loss diagram

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#### Loss diagram over the whole year

