

## Grid-Connected System: Simulation parameters

**Project :** Cprismenergia

**Geographical Site** Cprismenergia Country **Portugal**

**Situation** Latitude 41.17° N Longitude -8.60° W  
Time defined as Legal Time Time zone UT Altitude 138 m

Albedo 0.20

**Meteo data:** Cprismenergia PVGIS ERA5 hourly time series averages 01/01/10 to 31/12/16 - Syn

**Simulation variant :** New simulation variant

Simulation date 16/04/19 12h13

**Simulation parameters** System type **No 3D scene defined, no shadings**

**Collector Plane Orientation** Tilt 15° Azimuth 15°

**Models used** Transposition Perez Diffuse Perez, Meteonorm

**Horizon** Free Horizon

**Near Shadings** No Shadings

**User's needs :** Unlimited load (grid)

### PV Arrays Characteristics (2 kinds of array defined)

**PV module** Si-poly Model **AXIpower AC-275P/60S**  
Original PVsyst database Manufacturer Axitec Energy

**Sub-array "Sub-array #1"**

Number of PV modules	In series	18 modules	In parallel	2 strings
Total number of PV modules	Nb. modules	36	Unit Nom. Power	275 Wp
Array global power	Nominal (STC)	<b>9.90 kWp</b>	At operating cond.	8.91 kWp (50°C)
Array operating characteristics (50°C)	U mpp	512 V	I mpp	17 A

**Sub-array "Sub-array #2"**

Number of PV modules	In series	13 modules	In parallel	1 strings
Total number of PV modules	Nb. modules	13	Unit Nom. Power	275 Wp
Array global power	Nominal (STC)	<b>3575 Wp</b>	At operating cond.	3218 Wp (50°C)
Array operating characteristics (50°C)	U mpp	370 V	I mpp	8.7 A

**Total** Arrays global power Nominal (STC) **13 kWp** Total 49 modules  
Module area **79.7 m<sup>2</sup>** Cell area 71.5 m<sup>2</sup>

**Inverter** Model **Sunny Tripower 15000TL-10**  
Original PVsyst database Manufacturer SMA

Characteristics Operating Voltage 150-800 V Unit Nom. Power 15.0 kWac

**Sub-array "Sub-array #1"** Nb. of inverters 1 \* MPPT 0.80 Total Power 11.0 kWac  
Pnom ratio 0.90

**Sub-array "Sub-array #2"** Nb. of inverters 1 \* MPPT 0.20 Total Power 4.0 kWac  
Pnom ratio 0.90

**Total** Nb. of inverters 1 Total Power 15 kWac

### PV Array loss factors

Thermal Loss factor	Uc (const)	20.0 W/m <sup>2</sup> K	Uv (wind)	0.0 W/m <sup>2</sup> K / m/s
Wiring Ohmic Loss	Array#1	491 mOhm	Loss Fraction	1.5 % at STC
	Array#2	709 mOhm	Loss Fraction	1.5 % at STC
	Global		Loss Fraction	1.5 % at STC
LID - Light Induced Degradation			Loss Fraction	3.0 %
Module Quality Loss			Loss Fraction	0.0 %
Module Mismatch Losses			Loss Fraction	2.0 % at MPP
Strings Mismatch loss			Loss Fraction	0.10 %

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Incidence effect (IAM): Fresnel smooth glass,  $n = 1.526$

0°	30°	50°	60°	70°	75°	80°	85°	90°
1.000	0.998	0.981	0.948	0.862	0.776	0.636	0.403	0.000

*PVsyst TRIAL*

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*PVsyst TRIAL*

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## Grid-Connected System: Main results

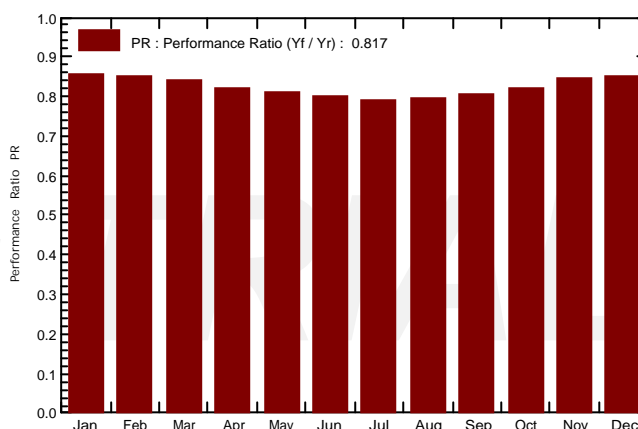
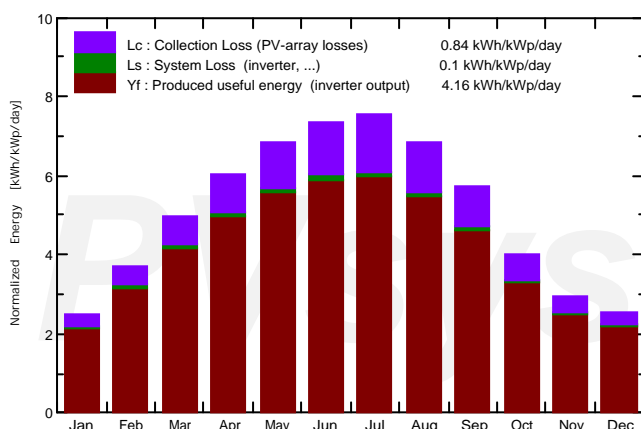
**Project :** Cprismenergia  
**Simulation variant :** New simulation variant

<b>Main system parameters</b>		System type	<b>No 3D scene defined, no shadings</b>	
PV Field Orientation		tilt	15°	azimuth 15°
PV modules		Model	AXIpower AC-275P/60S	Pnom 275 Wp
PV Array		Nb. of modules	49	Pnom total <b>13.48 kWp</b>
Inverter		Model	Sunny Tripower 15000TL-10	15.00 kW ac
User's needs		Unlimited load (grid)		

**Main simulation results**  
 System Production **Produced Energy 20.47 MWh/year** Specific prod. 1519 kWh/kWp/year  
 Performance Ratio PR **81.71 %**

**Normalized productions (per installed kWp): Nominal power 13.48 kWp**

**Performance Ratio PR**



### New simulation variant Balances and main results

	GlobHor kWh/m <sup>2</sup>	DiffHor kWh/m <sup>2</sup>	T_Amb °C	GlobInc kWh/m <sup>2</sup>	GlobEff kWh/m <sup>2</sup>	EArray MWh	E_Grid MWh	PR
<b>January</b>	56.3	21.83	9.64	77.1	73.5	0.911	0.889	0.856
<b>February</b>	81.2	27.29	9.42	104.0	100.0	1.223	1.196	0.854
<b>March</b>	130.7	39.84	11.82	154.0	148.6	1.781	1.741	0.839
<b>April</b>	167.1	48.65	14.17	180.4	174.3	2.046	2.001	0.823
<b>May</b>	207.8	53.48	16.22	212.5	205.4	2.375	2.322	0.811
<b>June</b>	220.2	53.75	18.78	220.7	213.3	2.437	2.381	0.801
<b>July</b>	230.9	49.38	20.51	233.5	225.8	2.549	2.491	0.792
<b>August</b>	200.0	46.46	20.69	212.4	205.8	2.332	2.280	0.797
<b>September</b>	150.9	37.98	19.72	172.6	166.9	1.916	1.873	0.806
<b>October</b>	101.2	32.77	16.94	124.6	119.7	1.413	1.381	0.823
<b>November</b>	65.2	23.70	12.47	88.3	84.2	1.027	1.004	0.844
<b>December</b>	54.5	20.23	10.45	79.3	75.1	0.932	0.911	0.853
<b>Year</b>	1666.0	455.37	15.10	1859.3	1792.7	20.944	20.472	0.817

Legends: GlobHor Horizontal global irradiation      GlobEff Effective Global, corr. for IAM and shadings  
 DiffHor Horizontal diffuse irradiation      EArray Effective energy at the output of the array  
 T\_Amb Ambient Temperature      E\_Grid Energy injected into grid  
 GlobInc Global incident in coll. plane      PR Performance Ratio

### Grid-Connected System: Loss diagram

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User's needs	Unlimited load (grid)			

#### Loss diagram over the whole year

