Simulazione Catania Caltagirone 5KWp Sistema Fisso
Progetto ECONTEK

Grid-connected PV system: Simulation parameters

Project :	**CATANIA 5KWp**				
Geographical site :	**Caltagirone (CT)**		**Country**	**Italy**	
Situation :	Latitude	37.1°N	Longitude	14.3°E	
Time defined as :	Legal time	Time zone UT+1	Altitude	500 m	
	Albedo	0.20			
Meteo data :	Caltagirone (CT) , synthetic hourly data				

Simulation variant :	**Simulation variant**				
	Simulation date	15/12/06 18h10			

Simulation parameters :

Collector Plane orientation	Tilt	30°	Azimuth	0°
Horizon	Free horizon			
Near shadings	No Shadings			

PV array characteristics :

PV module:	Si-poly	Module name	**KC 175GT**		
		Manufacturer	Kyocera		
Number of PV modules :		in serie	14 modules	in parallel	2 strings
Total number of PV modules :		Nb. modules	28	unit nom. power	175 Wp
Array global power		Nominal (STC)	**4.9 kWp**	At oper. cond.	4.2 kWp (50°C)
Array operating characteristics (50°C)		U mpp	289 V	I mpp	15 A
Total area		Module area	**35.8 m²**		

PV array loss factors :

Heat Loss Factor	k (const)	29.0 W/m²K	k (wind)	0.0 W/m²K / m/s
=> Nominal Oper. Coll. Temp. (800 W/m², Tamb=20°C, wind 1 m/s)			NOCT	45 °C
Wiring ohmic losses	Global field res.	661.3 mOhm	Loss fraction	3.1 % at STC
Serie diode loss	Voltage drop	0.7 V	Loss fraction	0.2 % at STC
Module quality losses			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	0.05

System parameter:	System type	**Grid-connected**		
Inverter	Model	**IG 60 El**		
	Manufacturer	Fronius		
Inverter characteristics	Operating voltage	150-400 V	Unit nom. power	4.6 kW AC

User's needs : Unlimited load (grid)

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Grid-connected PV system: Main results

Project : **CATANIA 5KWp**

Simulation variant : **Simulation variant**

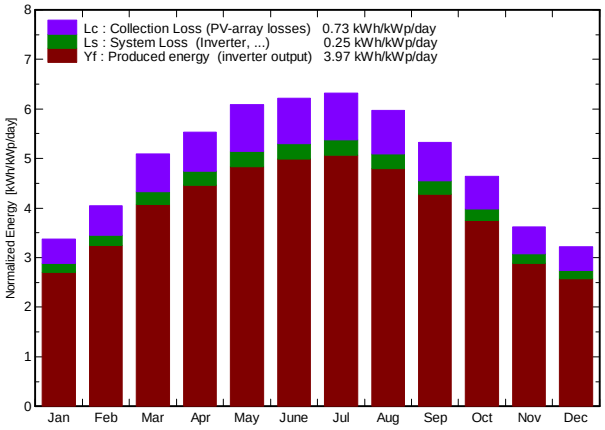
Main system parameters	System type	**Grid-connected**			
PV field orientation	Tilt	30°	Azimut	0°	
PV modules	Model	KC 175GT	Pnom	175 Wp	
PV array	Nb of modules	28	Pnom total	**4.9 kWp**	
Inverter	Model	IG 60 El	Pnom	4.6 kWp ac	
User's needs	Unlimited load (grid)				

Main simulation results

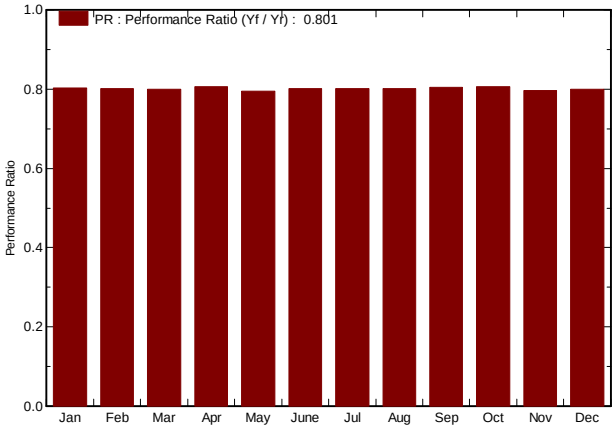
System production — **Produced energy** **7109 kWh/year** Specific 1451 kWh/kWp/year

Performance ratio PR 80.1 %

Normalized productions (per installed kWp): Nominal power 4.9 kWp



Performance Ratio



Simulation variant

Balances and main results

	GlobHor kWh/m²	T Amb °C	GlobInc kWh/m²	GlobEff kWh/m²	EArray kWh	EOutInv kWh	EffArrR %	EffSysR %
January	71.6	-0.00	104.6	101.5	437.8	411.4	11.71	11.00
February	87.9	0.00	113.3	109.9	472.7	444.7	11.67	10.98
March	133.6	-0.00	157.8	153.3	657.5	618.3	11.65	10.96
April	159.9	0.00	166.1	160.9	696.4	655.5	11.73	11.04
May	196.2	-0.00	188.7	182.8	781.8	734.9	11.59	10.89
June	202.5	0.00	186.6	180.6	778.8	732.6	11.67	10.98
July	208.3	0.00	195.8	189.6	817.4	768.9	11.68	10.98
August	184.1	-0.00	185.2	179.6	773.8	727.9	11.68	10.99
September	142.5	-0.00	159.8	155.1	669.5	629.8	11.72	11.02
October	112.8	-0.00	144.0	139.9	605.2	569.3	11.75	11.06
November	75.9	0.00	108.7	105.5	451.7	424.5	11.62	10.92
December	66.3	-0.00	99.9	96.8	416.4	391.2	11.66	10.96
Yearly sum	1641.8	-0.00	1810.4	1755.6	7559.1	7109.0	11.68	10.98

Legends:

GlobHor	Horizontal global irradiation	EArray	Effective energy at the output of the array
T Amb	Ambient Temperature	EOutInv	Available Energy at Inverter Output
GlobInc	Global incident in coll. plane	EffArrR	Effic. Eout array / rough area
GlobEff	"Effective" Global, corr. for IAM and shadings	EffSysR	Effic. Eout system / rough area

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Grid-connected PV system: Loss diagram

Project : **CATANIA 5KWp**

Simulation variant : **Simulation variant**

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PV modules	Model	KC 175GT	Pnom	175 Wp	
PV array	Nb of modules	28	Pnom total	**4.9 kWp**	
Inverter	Model	IG 60 El	Pnom	4.6 kWp ac	
User's needs	Unlimited load (grid)				

Loss diagram over the whole year