Simulazione Catania Caltagirone 10KWp Sistema fisso
Progetto ECONTEK

Grid-connected PV system: Simulation parameters

Project :	**CATANIA 10KWp**			
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 18h14		

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	10 modules	in parallel	6 strings
Total number of PV modules :		Nb. modules	60	unit nom. power	175 Wp
Array global power		Nominal (STC)	**11 kWp**	At oper. cond.	9.1 kWp (50°C)
Array operating characteristics (50°C)		U mpp	207 V	I mpp	44 A
Total area		Module area	**76.6 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.	157.3 mOhm	Loss fraction	3.1 % at STC
Serie diode loss	Voltage drop	0.7 V	Loss fraction	0.3 % 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 40 El**		
	Manufacturer	Fronius		
Inverter characteristics	Operating voltage	150-400 V	Unit nom. power	3.5 kW AC
Inverter pack	Number of inverters	3 units	Total power	10.5 kW AC

User's needs : Unlimited load (grid)

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Grid-connected PV system: Main results

Project : **CATANIA 10KWp**

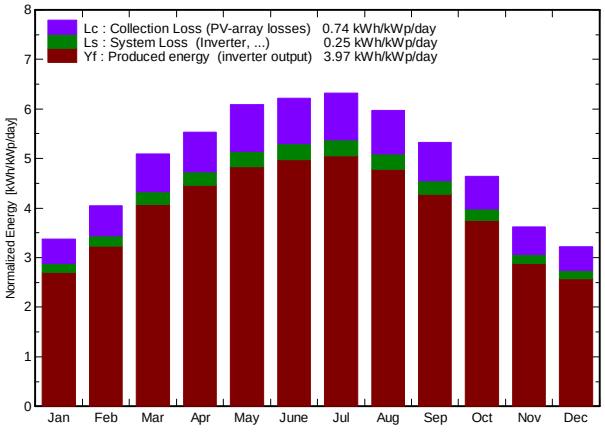
Simulation variant : **Simulation variant**

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	60	Pnom total	**11 kWp**	
Inverter	Model	IG 40 El	Pnom	3.5 kWp ac	
Inverter pack	Nb of units	3	Pnom total	**11 kWp ac**	
User's needs	Unlimited load (grid)				

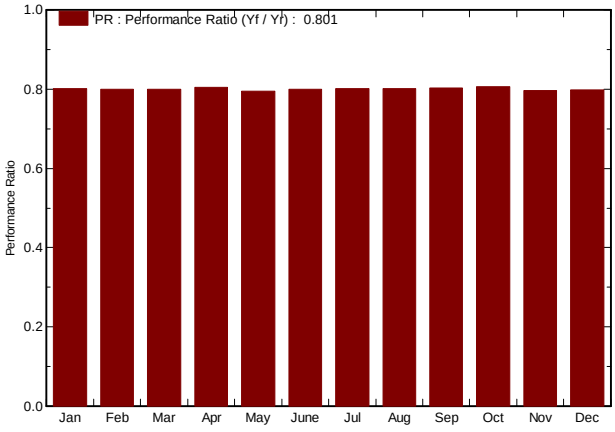
Main simulation results

System production	**Produced energy**	**15.22 MWh/year**	Specific	1449 kWh/kWp/year
	Performance ratio PR	80.1 %		

Normalized productions (per installed kWp): Nominal power 11 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	937	880	11.69	10.99
February	87.9	0.00	113.3	109.9	1012	952	11.66	10.96
March	133.6	-0.00	157.8	153.3	1408	1324	11.64	10.95
April	159.9	0.00	166.1	160.9	1491	1403	11.71	11.03
May	196.2	-0.00	188.7	182.8	1674	1573	11.58	10.88
June	202.5	0.00	186.6	180.6	1667	1568	11.66	10.97
July	208.3	0.00	195.8	189.6	1750	1646	11.67	10.97
August	184.1	-0.00	185.2	179.6	1656	1558	11.67	10.98
September	142.5	-0.00	159.8	155.1	1433	1348	11.71	11.01
October	112.8	-0.00	144.0	139.9	1296	1219	11.74	11.05
November	75.9	0.00	108.7	105.5	967	909	11.61	10.91
December	66.3	-0.00	99.9	96.8	891	837	11.65	10.94
Yearly sum	1641.8	-0.00	1810.4	1755.6	16182	15217	11.67	10.97

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 10KWp**

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	60	Pnom total	**11 kWp**
Inverter	Model	IG 40 El	Pnom	3.5 kWp ac
Inverter pack	Nb of units	3	Pnom total	**11 kWp ac**
User's needs	Unlimited load (grid)			

Loss diagram over the whole year