

Siml. Catania Caltagirone 10KWp Sis Inseguito +45 -45 Est-Ov
Progetto ECONSTEK

Grid-connected PV system: Simulation parameters

Project :	CATANIA 10KWp INSEGUITO		
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 18h18	
Simulation parameters :			
Tracking plane, tilted axis	Axis tilt	0°	Axis Azimuth 30°
Rotation limitations	Minimum Phi	-45°	Maximum Phi 45°
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
Total number of PV modules :		Nb. modules	60
Array global power		Nominal (STC)	11 kWp
Array operating characteristics (50°C)		U mpp	207 V
Total area		Module area	76.6 m²
PV array loss factors :			
Heat Loss Factor	k (const)	29.0 W/m ² K	k (wind) 0.0 W/m ² K / m/s
=> Nominal Oper. Coll. Temp. (800 W/m ² , Tamb=20°C, wind 1 m/s)			NOCT 45 °C
Wiring ohmic losses	Global field res.	154.1 mOhm	Loss fraction 3.0 % 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 EI	
	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)		

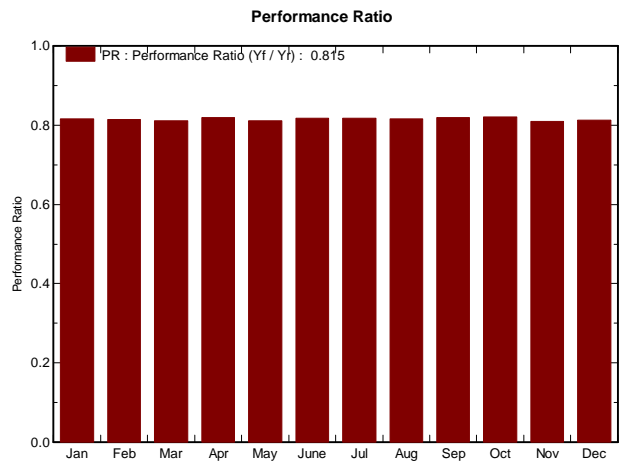
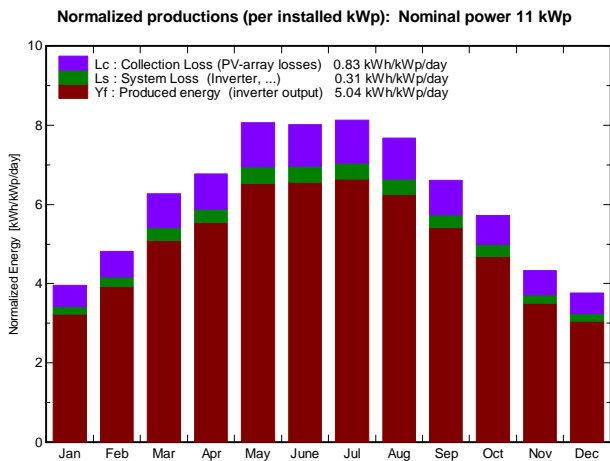
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Grid-connected PV system: Main results

Project : CATANIA 10KWp INSEGUITO
Simulation variant : Simulation variant

Main system parameters	System type Grid-connected	
PV field orientation Tracking, tilted axis, axis tilt:	30°	axis azimuth 0°
PV modules Model	KC 175GT	Pnom 175 Wp
PV array Nb of modules	60	Pnom total 11 kWp
Inverter Model	IG 40 EI	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 19.32 MWh/year** Specific 1840 kWh/kWp/year
Performance ratio PR 81.5 %



Simulation variant
Balances and main results

	GlobHor kWh/m ²	T Amb °C	GlobInc kWh/m ²	GlobEff kWh/m ²	EArray kWh	EOutInv kWh	EffArrR %	EffSysR %
January	71.6	-0.00	122.8	120.2	1117	1051	11.88	11.18
February	87.9	0.00	135.0	132.3	1226	1155	11.86	11.16
March	133.6	-0.00	194.5	191.1	1761	1657	11.81	11.12
April	159.9	0.00	203.0	198.8	1853	1745	11.91	11.22
May	196.2	-0.00	249.9	245.2	2259	2126	11.80	11.10
June	202.5	0.00	240.6	235.4	2193	2065	11.89	11.20
July	208.3	0.00	251.9	246.8	2294	2161	11.89	11.19
August	184.1	-0.00	237.6	233.3	2161	2035	11.87	11.17
September	142.5	-0.00	198.2	194.6	1808	1703	11.91	11.21
October	112.8	-0.00	177.4	174.2	1623	1528	11.94	11.24
November	75.9	0.00	129.8	127.3	1172	1102	11.79	11.08
December	66.3	-0.00	116.7	114.2	1060	996	11.85	11.14
Yearly sum	1641.8	-0.00	2257.4	2213.4	20528	19325	11.87	11.17

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 INSEGUITO

Simulation variant : Simulation variant

Main system parameters	System type	Grid-connected		
PV field orientation	Tracking, tilted axis, axis tilt:	30°	axis azimuth	0°
PV modules	Model	KC 175GT	Pnom	175 Wp
PV array	Nb of modules	60	Pnom total	11 kWp
Inverter	Model	IG 40 EI	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

