Simulazione Roma 10KWp Sistema Fisso
Progetto ECONTEK

Grid-connected PV system: Simulation parameters

Project :	**Roma 5KWp**				
Geographical site :	**Roma**		**Country**	**Italy**	
Situation :	Latitude	42.1°N	Longitude	12.3°E	
Time defined as :	Legal time	Time zone UT+1	Altitude	15 m	
	Albedo	0.20			
Meteo data :	Roma , synthetic hourly data				

Simulation variant :	**Simulation variant**			
	Simulation date	15/12/06 17h59		

Simulation parameters :

Collector Plane orientation	Tilt	34°	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.	144.5 mOhm	Loss fraction	2.8 % 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 30 El**		
	Manufacturer	Fronius		
Inverter characteristics	Operating voltage	150-400 V	Unit nom. power	2.5 kW AC
Inverter pack	Number of inverters	3 units	Total power	7.5 kW AC

User's needs : Unlimited load (grid)

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Grid-connected PV system: Main results

Project : **Roma 5KWp**

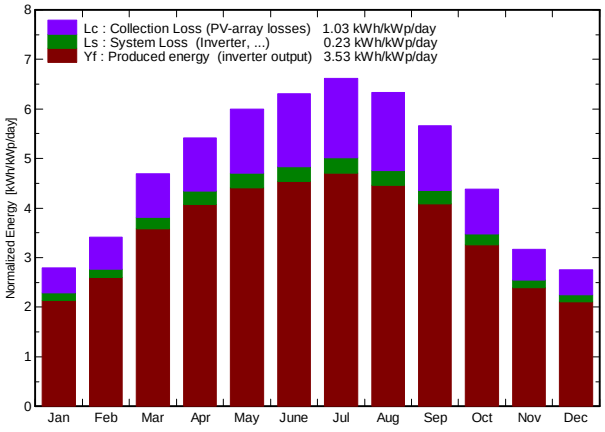
Simulation variant : **Simulation variant**

Main system parameters	System type	**Grid-connected**			
PV field orientation	Tilt	34°	Azimut	0°	
PV modules	Model	KC 175GT	Pnom	175 Wp	
PV array	Nb of modules	60	Pnom total	**11 kWp**	
Inverter	Model	IG 30 El	Pnom	2.50 kWp ac	
Inverter pack	Nb of units	3	Pnom total	**7.5 kWp ac**	
User's needs	Unlimited load (grid)				

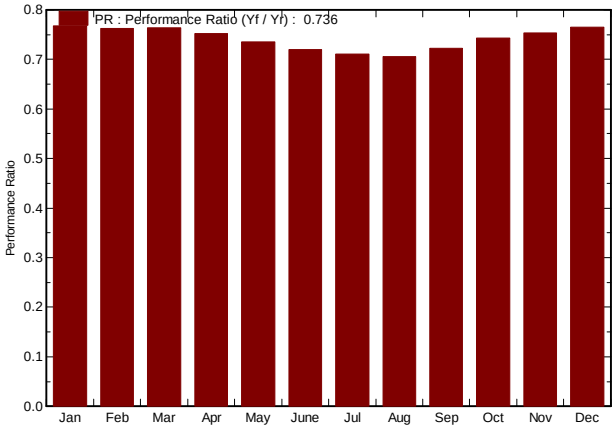
Main simulation results

System production	**Produced energy**	**13.54 MWh/year**	Specific	1290 kWh/kWp/year
	Performance ratio PR	73.6 %		

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	56.0	8.00	86.4	83.8	744	696	11.23	10.51
February	71.0	8.90	95.4	92.6	815	764	11.15	10.45
March	120.0	11.00	145.5	141.2	1242	1166	11.15	10.46
April	153.0	13.30	162.6	157.7	1368	1283	10.98	10.30
May	191.0	17.40	186.0	180.4	1532	1436	10.75	10.08
June	203.0	21.30	189.1	183.1	1524	1430	10.52	9.87
July	217.0	24.20	205.2	198.8	1631	1530	10.37	9.73
August	189.0	24.80	196.1	190.3	1549	1453	10.30	9.67
September	141.0	21.70	169.6	164.7	1372	1287	10.55	9.90
October	99.0	17.30	135.9	132.2	1130	1060	10.85	10.18
November	61.0	11.90	95.1	92.4	803	752	11.02	10.32
December	48.0	9.20	85.5	83.2	734	687	11.20	10.49
Yearly sum	1549.0	15.79	1752.5	1700.3	14445	13545	10.76	10.09

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 : **Roma 5KWp**

Simulation variant : **Simulation variant**

Main system parameters	System type	**Grid-connected**			
PV field orientation	Tilt	34°	Azimut	0°	
PV modules	Model	KC 175GT	Pnom	175 Wp	
PV array	Nb of modules	60	Pnom total	**11 kWp**	
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Inverter pack	Nb of units	3	Pnom total	**7.5 kWp ac**	
User's needs	Unlimited load (grid)				

Loss diagram over the whole year