Grid-Connected System: Simulation parameters

Project : **JuizdeFora_10kW**

Geographical Site	**Juiz de Fora**		Country	**Brazil**
Situation	Latitude	-21.76° S	Longitude	-43.34° W
Time defined as	Legal Time	Time zone UT-3	Altitude	687 m
	Albedo	0.20		
Meteo data:	**Juiz de Fora**	Meteonorm 7.1 (1900-1900), Sat=100% - Synthetic		

Simulation variant : **New simulation variant**

Simulation date 09/11/17 21h02

Simulation parameters

Collector Plane Orientation	Tilt	22°	Azimuth	0°
Models used	Transposition	Perez	Diffuse	Perez, Meteonorm
Horizon	Free Horizon			
Near Shadings	No Shadings			

PV Array Characteristics

PV module	Si-poly	Model	**CS6U - 325P-AG**	
Custom parameters definition		Manufacturer	Canadian Solar Inc.	
Number of PV modules		In series	11 modules	In parallel 3 strings
Total number of PV modules		Nb. modules	33	Unit Nom. Power 325 Wp
Array global power		Nominal (STC)	**10.72 kWp**	At operating cond. 9.17 kWp (60°C)
Array operating characteristics (50°C)		U mpp	347 V	I mpp 26 A
Total area		Module area	**64.8 m²**	Cell area 57.8 m²

Inverter		Model	**IG Plus 120 V-3**	
Original PVsyst database		Manufacturer	Fronius International	
Characteristics		Operating Voltage	230-500 V	Unit Nom. Power 10.0 kWac
Inverter pack		Nb. of inverters	1 units	Total Power 10.0 kWac

PV Array loss factors

Thermal Loss factor	Uc (const)	20.0 W/m²K	Uv (wind)	0.0 W/m²K / m/s
Wiring Ohmic Loss	Global array res.	232 mOhm	Loss Fraction	1.5 % at STC
Module Quality Loss			Loss Fraction	-0.4 %
Module Mismatch Losses			Loss Fraction	1.0 % at MPP
Strings Mismatch loss			Loss Fraction	0.10 %

Incidence effect (IAM): User defined IAM profile

10°	20°	30°	40°	50°	60°	70°	80°	90°
0.998	0.998	0.995	0.992	0.986	0.970	0.917	0.763	0.000

User's needs : Unlimited load (grid)

Grid-Connected System: Main results

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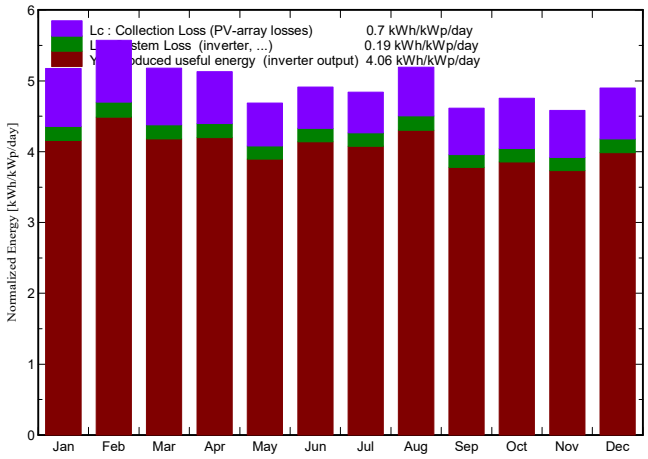
Simulation variant : **New simulation variant**

Main system parameters				
	System type	**Grid-Connected**		
PV Field Orientation	tilt	22°	azimuth	0°
PV modules	Model	CS6U - 325P-AG	Pnom	325 Wp
PV Array	Nb. of modules	33	Pnom total	**10.72 kWp**
Inverter	Model	IG Plus 120 V-3	Pnom	10.00 kW ac
User's needs	Unlimited load (grid)			

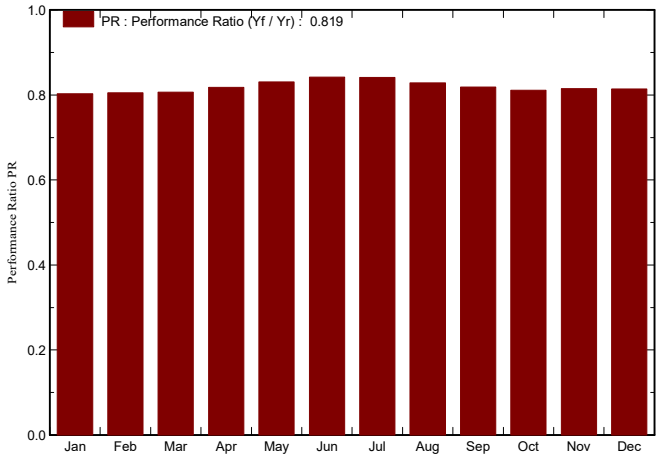
Main simulation results

System Production	**Produced Energy**	**15.91 MWh/year**	Specific prod.	1483 kWh/kWp/year
	Performance Ratio PR	81.94 %		

Normalized productions (per installed kWp): Nominal power 10.72 kWp



Performance Ratio PR



New simulation variant

Balances and main results

	GlobHor kWh/m²	DiffHor kWh/m²	T Amb °C	GlobInc kWh/m²	GlobEff kWh/m²	EArray MWh	E_Grid MWh	PR
January	173.4	88.80	24.40	160.5	156.3	1.449	1.382	0.803
February	160.7	76.20	24.60	156.1	152.0	1.412	1.348	0.805
March	155.1	78.50	24.10	160.5	156.6	1.456	1.389	0.807
April	134.6	58.20	22.60	153.9	150.9	1.415	1.350	0.818
May	117.1	44.30	20.20	145.3	142.5	1.356	1.295	0.831
June	112.4	39.10	18.90	147.4	144.6	1.393	1.331	0.842
July	116.3	39.70	18.40	150.1	147.2	1.418	1.355	0.842
August	136.0	51.20	19.90	161.0	157.9	1.498	1.430	0.828
September	131.7	68.30	20.60	138.4	135.3	1.274	1.215	0.819
October	149.0	85.00	22.90	147.4	143.9	1.344	1.282	0.811
November	146.8	81.70	23.00	137.4	133.8	1.261	1.202	0.815
December	167.0	83.90	23.99	151.8	147.6	1.390	1.326	0.814
Year	1700.1	794.89	21.95	1809.8	1768.5	16.668	15.905	0.819

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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Loss diagram over the whole year