Grid-Connected System: Simulation parameters

Project : **5kw Standard Palace Grid**

Geographical Site	**Standard Palace**		Country	**Pakistan**
Situation	Latitude	31.45° N	Longitude	74.27° E
Time defined as	Legal Time	Time zone UT+5	Altitude	36 m
	Albedo	0.20		
Meteo data:	**Standard Palace**	Meteonorm 7.1 (1981-1990), Sat=1% - Synthetic		

Simulation variant : **New simulation variant**

Simulation date 22/09/21 20h48

Simulation parameters	System type	**No 3D scene defined**		
Collector Plane Orientation	Tilt	46°	Azimuth	-1°
Models used	Transposition	Perez	Diffuse	Perez, Meteonorm
Horizon	Free Horizon			
Near Shadings	No Shadings			

PV Array Characteristics

PV module	Si-poly	Model	**CS6K - 260P**		
Original PVsyst database		Manufacturer	Canadian Solar Inc.		
Number of PV modules		In series	10 modules	In parallel	2 strings
Total number of PV modules		Nb. modules	20	Unit Nom. Power	260 Wp
Array global power		Nominal (STC)	**5.20 kWp**	At operating cond.	4670 Wp (50°C)
Array operating characteristics (50°C)		U mpp	272 V	I mpp	17 A
Total area		Module area	**32.7 m²**	Cell area	29.2 m²

Inverter		Model	**Solar Inverter SOLIVIA 5.0 AP G3**		
Original PVsyst database		Manufacturer	Delta Energy		
Characteristics		Operating Voltage	150-450 V	Unit Nom. Power	5.00 kWac
Inverter pack		Nb. of inverters	1 units	Total Power	5.0 kWac
				Pnom ratio	1.04

PV Array loss factors

Array Soiling Losses			Loss Fraction	3.0 %
Thermal Loss factor	Uc (const)	20.0 W/m²K	Uv (wind)	0.0 W/m²K / m/s
Wiring Ohmic Loss	Global array res.	266 mOhm	Loss Fraction	1.5 % at STC
Module Quality Loss			Loss Fraction	-0.5 %
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

Project : **5kw Standard Palace Grid**

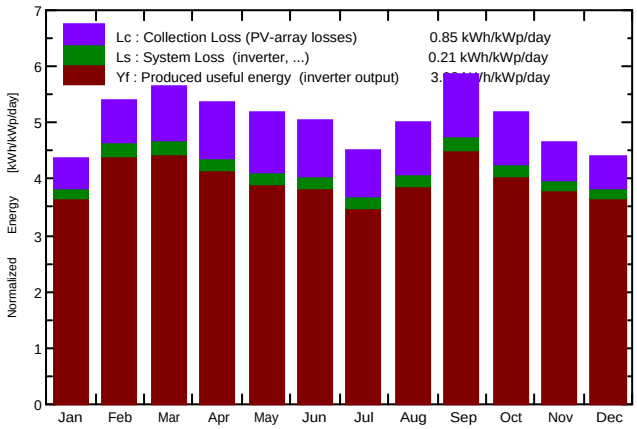
Simulation variant : **New simulation variant**

Main system parameters				
System type		**Grid-Connected**		
PV Field Orientation	tilt	46°	azimuth	-1°
PV modules	Model	CS6K - 260P	Pnom	260 Wp
PV Array	Nb. of modules	20	Pnom total	**5.20 kWp**
Inverter		Solar Inverter SOLIVIA 5.0 AP G3	Pnom	5.00 kW ac
User's needs		Unlimited load (grid)		

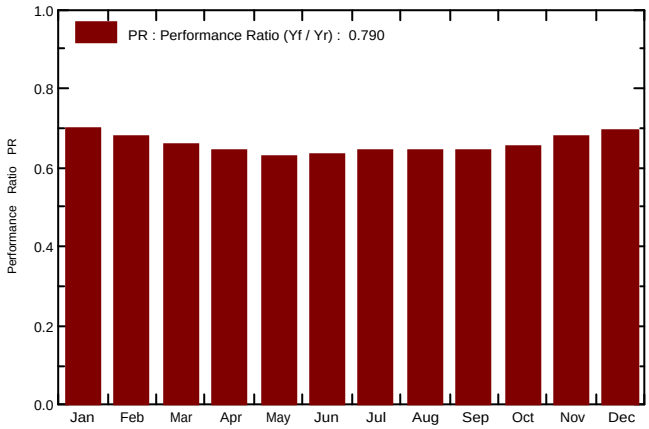
Main simulation results

System Production	**Produced Energy**	**7.55 MWh/year**	Specific prod.	1452 kWh/kWp/year
	Performance Ratio PR	78.96 %		

Normalized productions (per installed kWp): Nominal power 5.20 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	89.4	42.7	11.36	134.8	128.9	0.619	0.588	0.839
February	111.0	46.4	15.51	151.4	144.5	0.676	0.643	0.817
March	153.3	67.7	21.18	174.3	165.8	0.754	0.717	0.791
April	166.9	83.9	26.62	160.8	152.1	0.682	0.647	0.774
May	189.4	98.9	32.25	160.3	151.3	0.665	0.631	0.757
June	189.5	100.9	32.04	151.0	142.6	0.632	0.599	0.763
July	170.9	101.3	30.91	140.0	132.1	0.593	0.562	0.772
August	171.5	97.1	30.32	155.2	146.8	0.657	0.623	0.772
September	163.2	72.4	28.12	176.0	167.3	0.742	0.705	0.771
October	130.1	68.0	24.86	160.3	152.7	0.688	0.655	0.786
November	97.0	50.8	18.19	139.1	132.8	0.621	0.591	0.817
December	86.1	41.5	13.27	136.0	130.0	0.620	0.589	0.833
Year	1718.3	871.6	23.76	1839.2	1746.7	7.950	7.551	0.790

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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PV Field Orientation	tilt	46°	azimuth	-1°
PV modules	Model	CS6K - 260P	Pnom	260 Wp
PV Array	Nb. of modules	20	Pnom total	**5.20 kWp**
Inverter		Solar Inverter SOLIVIA 5.0 AP G3	Pnom	5.00 kW ac
User's needs	Unlimited load (grid)			

Loss diagram over the whole year