



Grid-Connected System: Simulation parameters

Project :	Grid-Connected Project at Sonora80M		
Geographical Site	Sonora80M	Country	Mexico
Situation	Latitude 29.0°N	Longitude	111.2°W
Time defined as	Legal Time Time zone UT-7	Altitude	210 m
Meteo data :	Sonora80M, Synthetic Hourly data		

Simulation variant :	New simulation variant		
	Simulation date	26/06/11 13h10	

Simulation parameters				
Tracking plane, tilted Axis	Axis Tilt	30°	Axis Azimuth	0°
	Rotation Limitations	Minimum Phi	-60°	Maximum Phi
Backtracking strategy	Tracker Spacing	6.60 m	Collector width	3.00 m
	Inactive band	Left	0.00 m	Right
Horizon	Free Horizon			
Near Shadings	No Shadings			

PV Array Characteristics			
PV module	Si-poly	Model	HiPerforma PLUTO 240-Wde
		Manufacturer	Suntech
Number of PV modules		In series	23 modules
Total number of PV modules		Nb. modules	333339
Array global power		Nominal (STC)	80001 kWp
Array operating characteristics (50°C)		U mpp	636 V
Total area		Module area	550569 m²
		In parallel	14493 strings
		Unit Nom. Power	240 Wp
		At operating cond.	72722 kWp (50°C)
		I mpp	114397 A

Inverter			
		Model	Sinvert PVS2400
		Manufacturer	Siemens
Characteristics		Operating Voltage	570-750 V
Inverter pack		Number of Inverter	33 units
		Unit Nom. Power	2400 kW AC
		Total Power	79200 kW AC

PV Array loss factors				
Thermal Loss factor	Uc (const)	20.0 W/m ² K	Uv (wind)	0.0 W/m ² K / m/s
=> Nominal Oper. Coll. Temp. (G=800 W/m ² , Tamb=20°C, Wind velocity = 1m/s.)			NOCT	56 °C
Wiring Ohmic Loss	Global array res.	0.093 mOhm	Loss Fraction	1.5 % at STC
Module Quality Loss			Loss Fraction	0.1 %
Module Mismatch Losses			Loss Fraction	2.0 % at MPP
Incidence effect, ASHRAE parametrization	IAM =	1 - bo (1/cos i - 1)	bo Parameter	0.05

User's needs : Unlimited load (grid)

Grid-Connected System: Main results

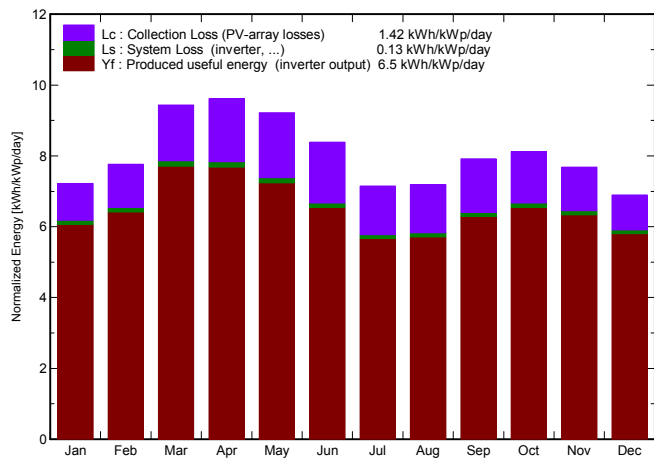
Project : Grid-Connected Project at Sonora80M

Simulation variant : New simulation variant

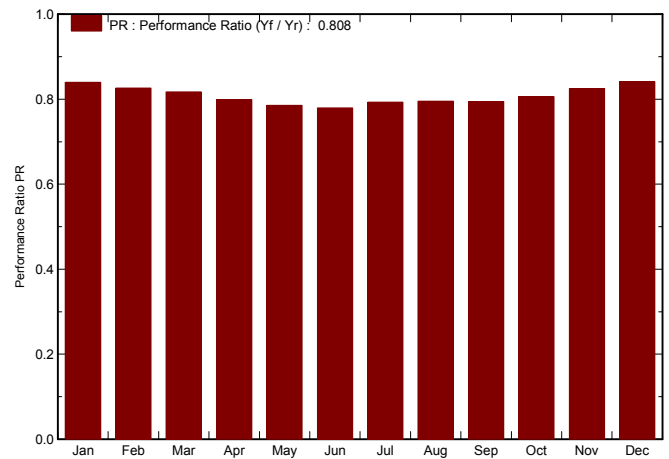
Main system parameters		System type	Grid-Connected
PV Field Orientation	tracking, tilted axis, Axis Tilt	30°	Axis Azimuth 0°
PV modules	Model	HiPerforma PLUTO 240-WdE	nom 240 Wp
PV Array	Nb. of modules	333339	Pnom total 80001 kWp
Inverter	Model	Sinvert PVS2400	Pnom 2400 kW ac
Inverter pack	Nb. of units	33.0	Pnom total 79200 kW ac
User's needs	Unlimited load (grid)		

Main simulation results
 System Production **Produced Energy 189787 MWh/year** Specific prod. 2372 kWh/kWp/year
 Performance Ratio PR **80.8 %**

Normalized productions (per installed kWp): Nominal power 80001 kWp



Performance Ratio PR



New simulation variant Balances and main results

	GlobHor kWh/m ²	T Amb °C	GlobInc kWh/m ²	GlobEff kWh/m ²	EArray kWh	E_Grid kWh	EffArrR %	EffSysR %
January	124.0	13.50	224.0	221.0	15340619	15044046	12.44	12.20
February	135.1	14.60	217.4	214.5	14652984	14375430	12.24	12.01
March	197.8	17.00	292.6	289.2	19502441	19127390	12.11	11.87
April	223.5	20.30	288.5	284.0	18816416	18442229	11.85	11.61
May	248.3	24.10	285.8	280.4	18314900	17958569	11.64	11.41
June	231.9	27.30	251.7	246.9	16001544	15697876	11.55	11.33
July	206.2	26.00	221.5	217.1	14322777	14055931	11.74	11.53
August	192.2	24.90	222.8	218.7	14450767	14172707	11.78	11.56
September	177.0	23.80	237.5	233.8	15387402	15095098	11.77	11.55
October	160.6	21.30	251.6	248.4	16538131	16222492	11.94	11.71
November	129.6	16.70	230.4	227.5	15495800	15202867	12.21	11.98
December	114.7	13.40	213.8	210.9	14670866	14392258	12.47	12.23
Year	2140.9	20.27	2937.5	2892.2	193494648	189786893	11.96	11.73

Legends: GlobHor Horizontal global 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 EffArrR Effic. Eout array / rough area
 GlobEff Effective Global, corr. for IAM and shadings EffSysR Effic. Eout system / rough area



Grid-Connected System: Loss diagram

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Loss diagram over the whole year

