Grid-Connected System: Simulation parameters

Project : **PVPMC_Challenge_1and2**

Geographical Site	**ABQ**		Country	**United States**
Situation	Latitude	35.05° N	Longitude	-106.64° W
Time defined as	Legal Time	Time zone UT-7	Altitude	1600 m

Monthly albedo values

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
Albedo	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.20	0.20

Meteo data: ABQ 2019

Simulation variant : S1

Simulation date 10/10/21 17h54

Simulation parameters	System type	No 3D scene defined, no shadings		
Collector Plane Orientation	Tilt	35°	Azimuth	180°
Models used	Transposition	Perez	Diffuse	Imported
Horizon	Free Horizon			
Near Shadings	No Shadings			
User's needs :	Unlimited load (grid)			

PV Array Characteristics

PV module	HIT	Model	VBHN325SA16	
Custom parameters definition		Manufacturer	Panasonic	
Number of PV modules		In series	7 modules	In parallel 6 strings
Total number of PV modules		Nb. modules	42	Unit Nom. Power 325 Wp
Array global power		Nominal (STC)	13.65 kWp	At operating cond. 12.87 kWp (50°C)
Array operating characteristics (50°C)		U mpp	379 V	I mpp 34 A
Total area		Module area	70.3 m²	Cell area 61.4 m²

Inverter		Model	Sunny Tripower 20000TL-30	
Original PVsyst database		Manufacturer	SMA	
Characteristics		Operating Voltage	320-800 V	Unit Nom. Power 20.0 kWac
Inverter pack		Nb. of inverters	1 units	Total Power 20 kWac
				Pnom ratio 0.68

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.	183 mOhm	Loss Fraction	1.5 % at STC
Module Quality Loss			Loss Fraction	2.5 %
Module Mismatch Losses			Loss Fraction	1.0 % at MPP
Strings Mismatch loss			Loss Fraction	0.10 %
Incidence effect, ASHRAE parametrization	IAM =	1 - bo (1/cos i - 1)	bo Param.	0.05

Grid-Connected System: Main results

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Simulation variant : **S1**

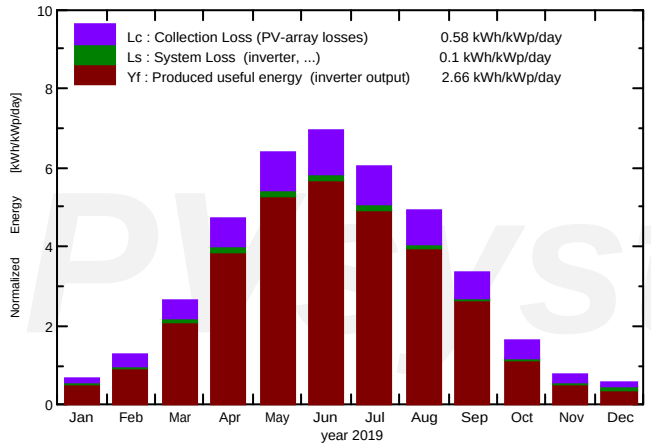
Main system parameters				
System type		**No 3D scene defined, no shadings**		
PV Field Orientation	tilt	35°	azimuth	180°
PV modules	Model	VBHN325SA16	Pnom	325 Wp
PV Array	Nb. of modules	42	Pnom total	**13.65 kWp**
Inverter	Model	Sunny Tripower 20000TL-30		20.00 kW ac
User's needs	Unlimited load (grid)			

Main simulation results

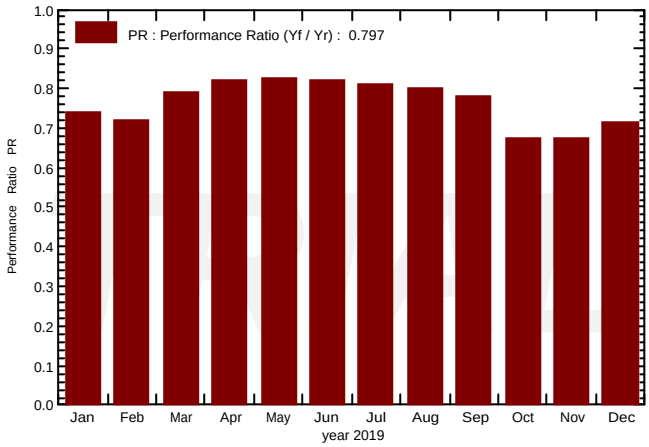
System Production — **Produced Energy** **13.28 MWh/year** — Specific prod. 973 kWh/kWp/year

Performance Ratio PR 79.69 %

Normalized productions (per installed kWp): Nominal power 13.65 kWp



Performance Ratio PR



S1

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
Jan. 19	96.3	25.32	2.33	21.7	20.4	0.244	0.218	0.738
Feb. 19	108.8	31.85	3.91	35.9	30.4	0.374	0.351	0.717
Mar. 19	156.1	50.71	7.65	82.0	73.5	0.919	0.884	0.790
Apr. 19	210.5	43.12	10.83	141.9	132.1	1.640	1.590	0.821
May 19	248.7	41.47	15.05	198.0	188.8	2.293	2.227	0.824
June 19	244.6	43.96	18.61	208.1	200.1	2.394	2.325	0.818
July 19	227.7	56.65	18.80	187.6	180.3	2.143	2.077	0.811
Aug. 19	208.8	55.59	18.01	152.6	144.7	1.724	1.669	0.802
Sep. 19	175.9	47.38	13.63	100.9	92.0	1.116	1.078	0.782
Oct. 19	151.4	24.74	9.93	51.3	42.1	0.503	0.474	0.676
Nov. 19	104.5	25.31	6.07	23.1	20.4	0.237	0.212	0.673
Dec. 19	94.0	19.92	2.39	17.3	16.6	0.194	0.169	0.717
Year	2027.5	466.02	10.64	1220.4	1141.5	13.783	13.275	0.797

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	T amb.	E_Grid	Energy injected into grid
GlobInc	Global incident in coll. plane	PR	Performance Ratio

Grid-Connected System: Special graphs

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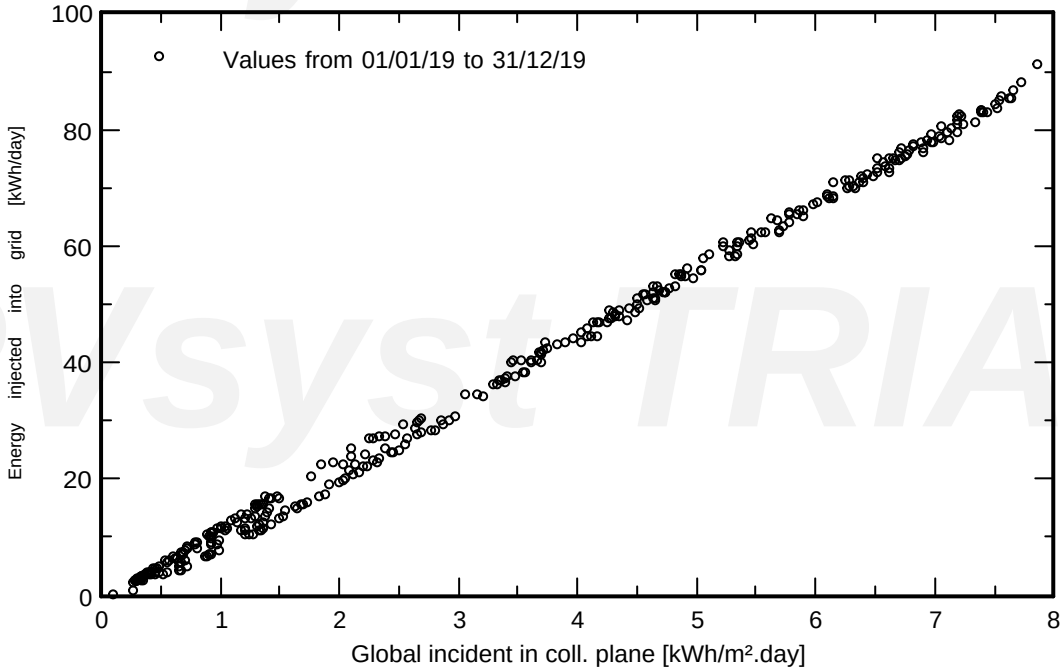
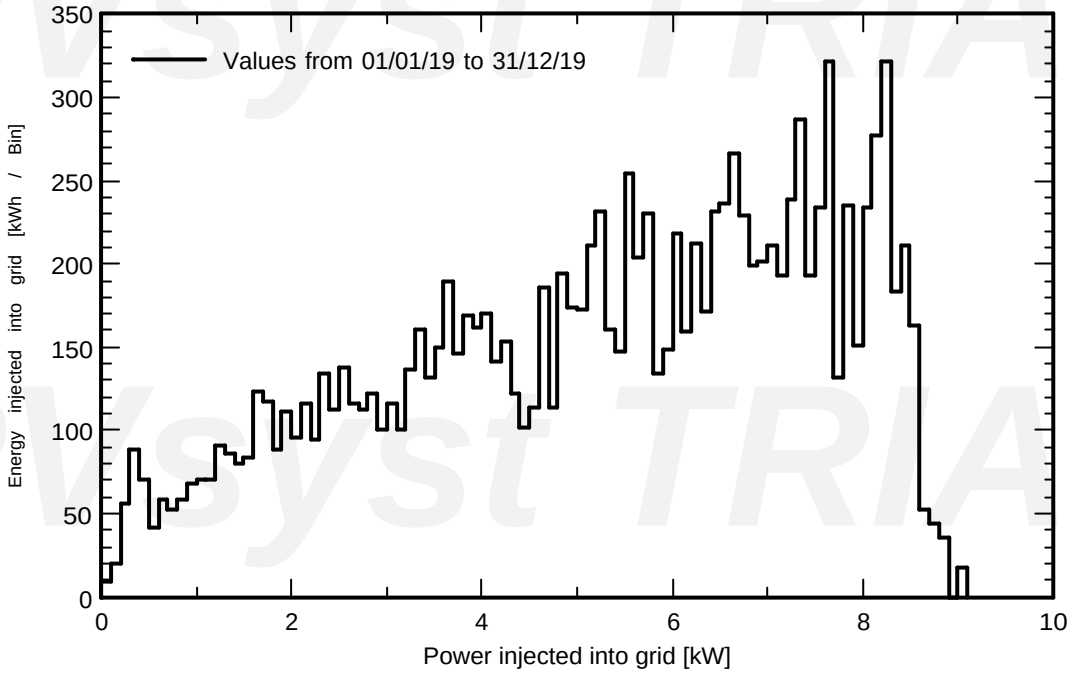
Daily Input/Output diagram



System Output Power Distribution



Grid-Connected System: Loss diagram

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Loss diagram over the whole year