

PVsyst - Simulation report

Standalone system

Project: CASA-0001-OffGrid

Variant: New simulation variant

Standalone system with batteries

System power: 1740 Wp

Poesía Mexicana - Mexico



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PVsyst V8.0.6

VCO, Simulation date:
22/02/25 20:21
with V8.0.6

Project summary			
Geographical Site	Situation	Project settings	
Poesía Mexicana	Latitude	Albedo	0.20
Mexico	Longitude		
	Altitude		
	Time zone		
Weather data			
Poesía Mexicana			
Meteonorm 8.2 (2000-2009) - Synthetic			

System summary					
Standalone system					Standalone system with batteries
Orientation #1					User's needs
Fixed plane	Daily household consumers				
Tilt/Azimuth	Constant over the year				
39 / 0 °	Average	7.7 kWh/Day			
System information					
PV Array		Battery pack			
Nb. of modules	3 units	Technology	Lithium-ion, LFP		
Pnom total	1740 Wp	Nb. of units	3 units		
		Voltage	192 V		
		Capacity	222 Ah		

Results summary					
Useful energy from solar	2499.0 kWh/year	Specific production	1436 kWh/kWp/year	Perf. Ratio PR	78.20 %
Missing Energy	309.9 kWh/year	Available solar energy	2626.7 kWh/year	Solar Fraction SF	88.97 %
Excess (unused)	29.1 kWh/year				

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General parameters		
Standalone system		Standalone system with batteries
Orientation #1		
Fixed plane		
Tilt/Azimuth	39 / 0 °	Sheds configuration No 3D scene defined
User's needs		Models used
Daily household consumers		Transposition Perez
Constant over the year		Diffuse Perez, Meteonorm
Average	7.7 kWh/Day	Circumsolar separate

PV Array Characteristics			
PV module		Controller	
Manufacturer	Generic	Universal controller	
Model	CS7L-580MS	Technology	MPPT converter
(Original PVsyst database)		Temp coeff.	-5.0 mV°C/Elem.
Unit Nom. Power	580 Wp	Converter	
Number of PV modules	3 units	Maxi and EURO efficiencies	97.0 / 95.0 %
Nominal (STC)	1740 Wp	Battery Management control	
Modules	1 strings x 3 In series	Threshold commands as	SOC calculation
At operating cond. (50°C)		Charging	SOC = 0.96 / 0.80
Pmpp	1594 Wp	Discharging	SOC = 0.10 / 0.35
U mpp	91 V		
I mpp	17 A		
Battery			
Manufacturer	Generic		
Model	Force H1 - 48/192V		
Technology	Lithium-ion, LFP		
Nb. of units	3 in parallel		
Discharging min. SOC	10.0 %		
Stored energy	38.4 kWh		
Battery Pack Characteristics			
Voltage	192 V		
Nominal Capacity	222 Ah (C10)		
Temperature	Fixed 20 °C		
Total PV power			
Nominal (STC)	1.74 kWp		
Total	3 modules		
Module area	8.5 m²		

Array losses			
Array Soiling Losses		Thermal Loss factor	DC wiring losses
Loss Fraction	3.0 %	Module temperature according to irradiance	Global array res.
		Uc (const)	86 mΩ
		Uv (wind)	1.5 % at STC
Serie Diode Loss		Module Quality Loss	Module mismatch losses
Voltage drop	0.7 V	Loss Fraction	Loss Fraction
Loss Fraction	0.7 % at STC	-0.4 %	1.0 % at MPP



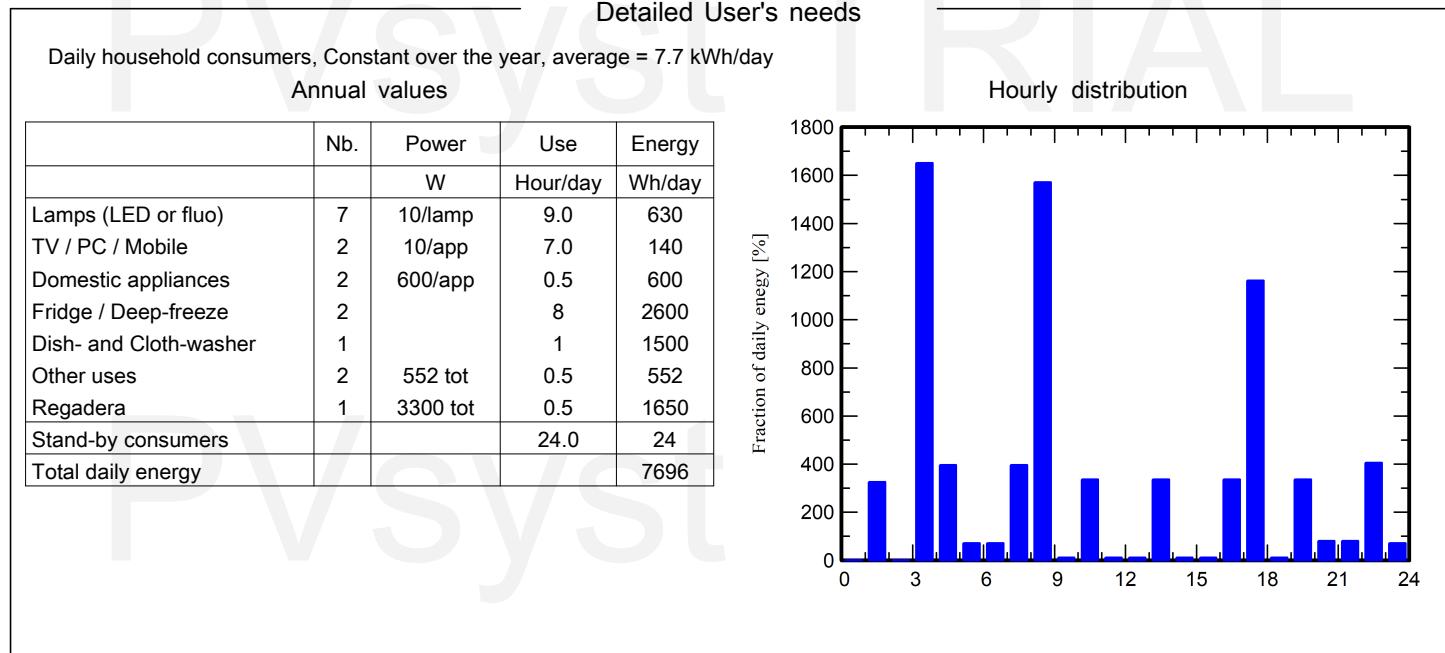
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Array losses								
IAM loss factor								
Incidence effect (IAM): User defined profile								
10°	20°	30°	40°	50°	60°	70°	80°	90°
0.998	0.998	0.995	0.992	0.986	0.970	0.917	0.763	0.000



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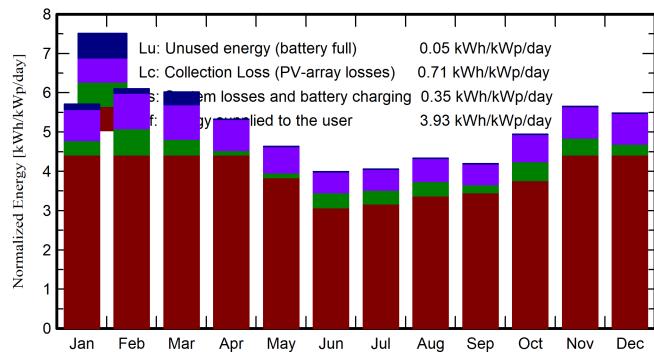
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Main results

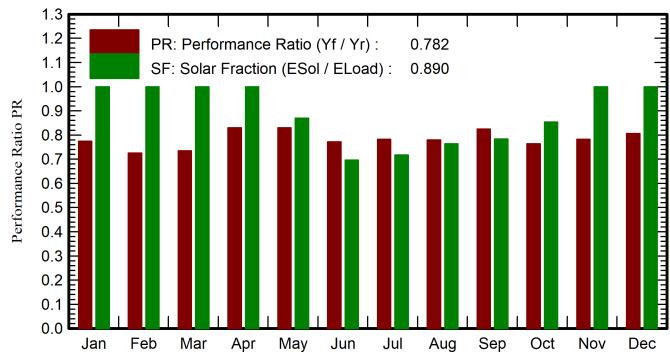
System Production	
Useful energy from solar	2499.0 kWh/year
Available solar energy	2626.7 kWh/year
Excess (unused)	29.1 kWh/year
Loss of Load	
Time Fraction	8.1 %
Missing Energy	309.9 kWh/year

Perf. Ratio PR	78.20 %
Solar Fraction SF	88.97 %
Battery aging (State of Wear)	
Cycles SOW	99.1 %
Static SOW	93.3 %

Normalized productions (per installed kWp)



Performance Ratio PR



Balances and main results

	GlobHor kWh/m²	GlobEff kWh/m²	E_Avail kWh	EUnused kWh	E_Miss kWh	E_User kWh	E_Load kWh	SolFrac ratio
January	132.8	169.6	254.6	6.96	0.0	238.6	238.6	1.000
February	142.9	163.5	242.7	5.05	0.0	215.5	215.5	1.000
March	180.0	177.6	266.7	17.12	0.0	238.6	238.6	1.000
April	179.6	151.2	226.8	0.00	0.0	230.9	230.9	1.000
May	179.5	135.1	203.8	0.00	31.1	207.5	238.6	0.870
June	157.3	112.3	171.7	0.00	70.1	160.8	230.9	0.696
July	161.3	118.2	180.7	0.00	67.4	171.2	238.6	0.718
August	156.4	126.8	192.7	0.00	56.3	182.2	238.6	0.764
September	133.8	119.4	182.9	0.00	50.1	180.8	230.9	0.783
October	139.5	146.2	219.3	0.00	34.9	203.7	238.6	0.854
November	133.1	162.5	242.9	0.00	0.0	230.9	230.9	1.000
December	125.0	163.1	242.0	0.00	0.0	238.6	238.6	1.000
Year	1821.2	1745.5	2626.7	29.14	309.9	2499.0	2808.9	0.890

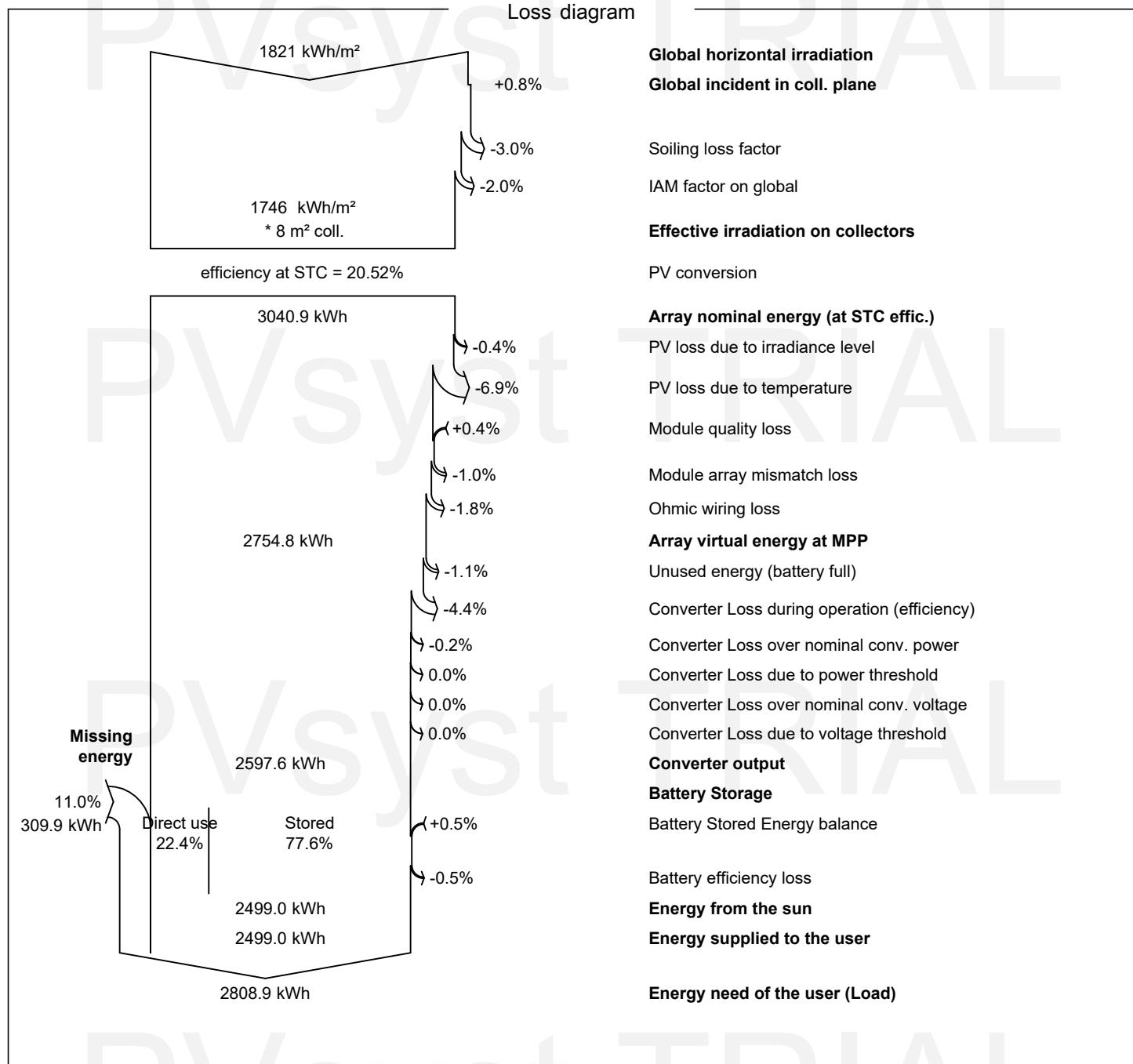
Legends

GlobHor	Global horizontal irradiation
GlobEff	Effective Global, corr. for IAM and shadings
E_Avail	Available Solar Energy
EUnused	Unused energy (battery full)
E_Miss	Missing energy

E_User	Energy supplied to the user
E_Load	Energy need of the user (Load)
SolFrac	Solar fraction (EUsed / ELoad)

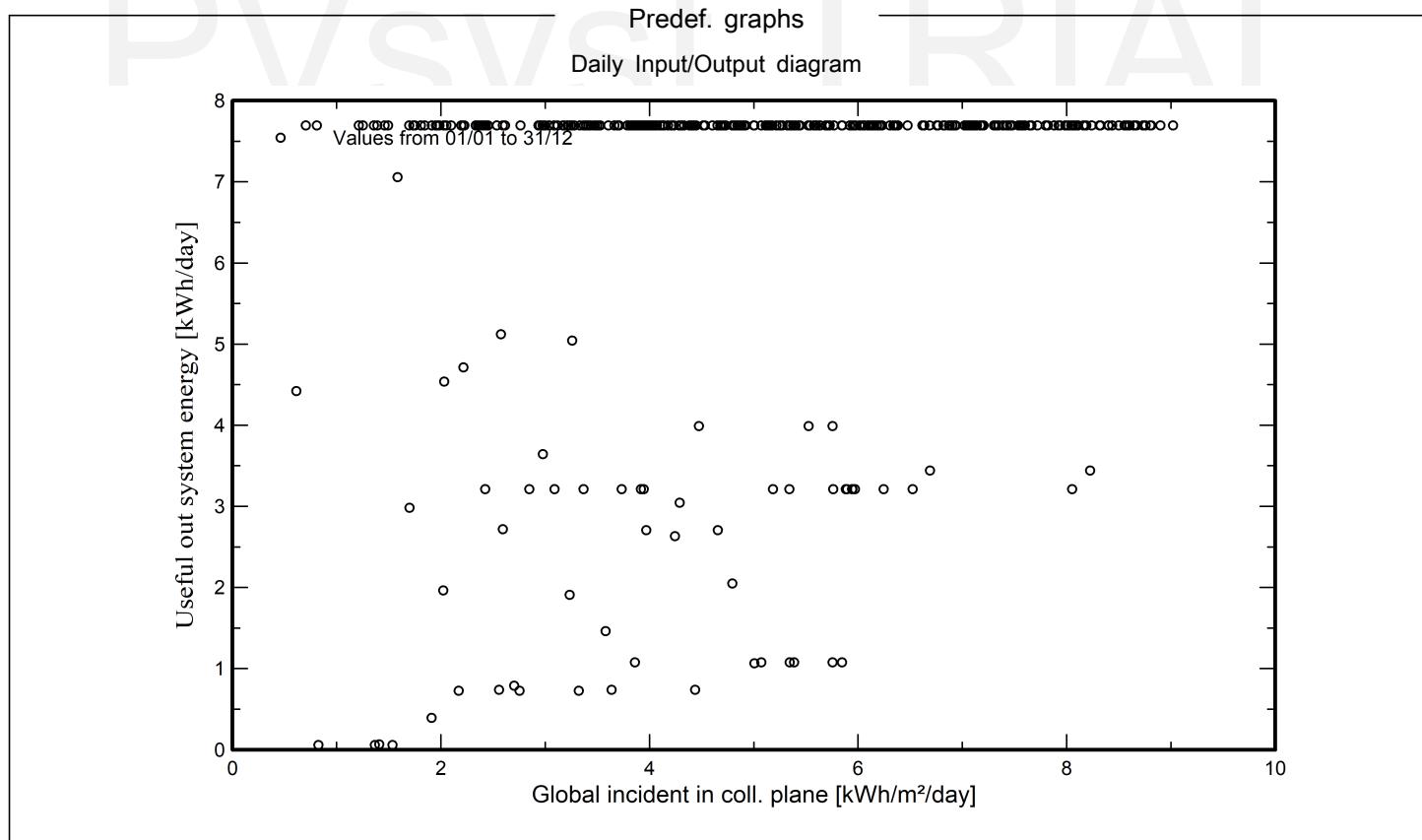


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CASA-0001-OffGrid CASA-0001, Poesia Mexicana, 55249 Ecatepec de Morelos, Méx.

Shading Heatmap



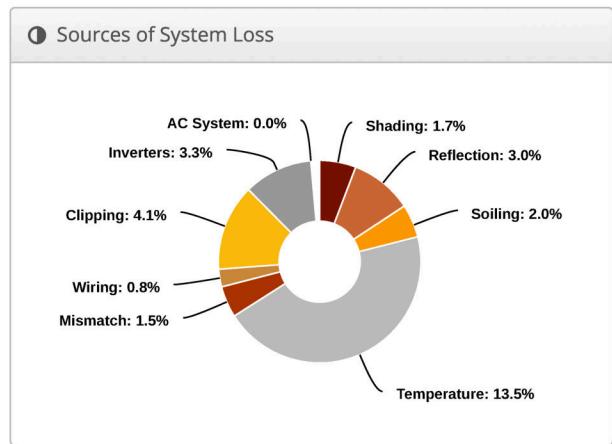
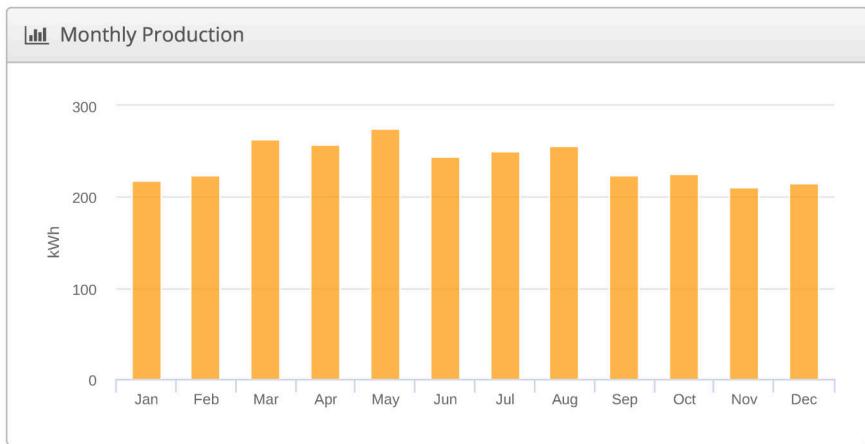
Shading by Field Segment

Description	Tilt	Azimuth	Modules	Nameplate	Shaded Irradiance	AC Energy	TOF ²	Solar Access	Avg TSRF ²
Field Segment 1	0.0°	203.0°	3	1.74 kWp	2,201.8 kWh/m ²	2.87 MWh ¹	93.6%	98.3%	92.0%
Totals, weighted by kWp			3	1.74 kWp	2,201.8 kWh/m²	2.87 MWh	93.6%	98.3%	92.0%

¹ approximate, varies based on inverter performance
² based on location Optimal POA Irradiance of 2,393.2 kWh/m² at 27.0° tilt and 175.0° azimuth

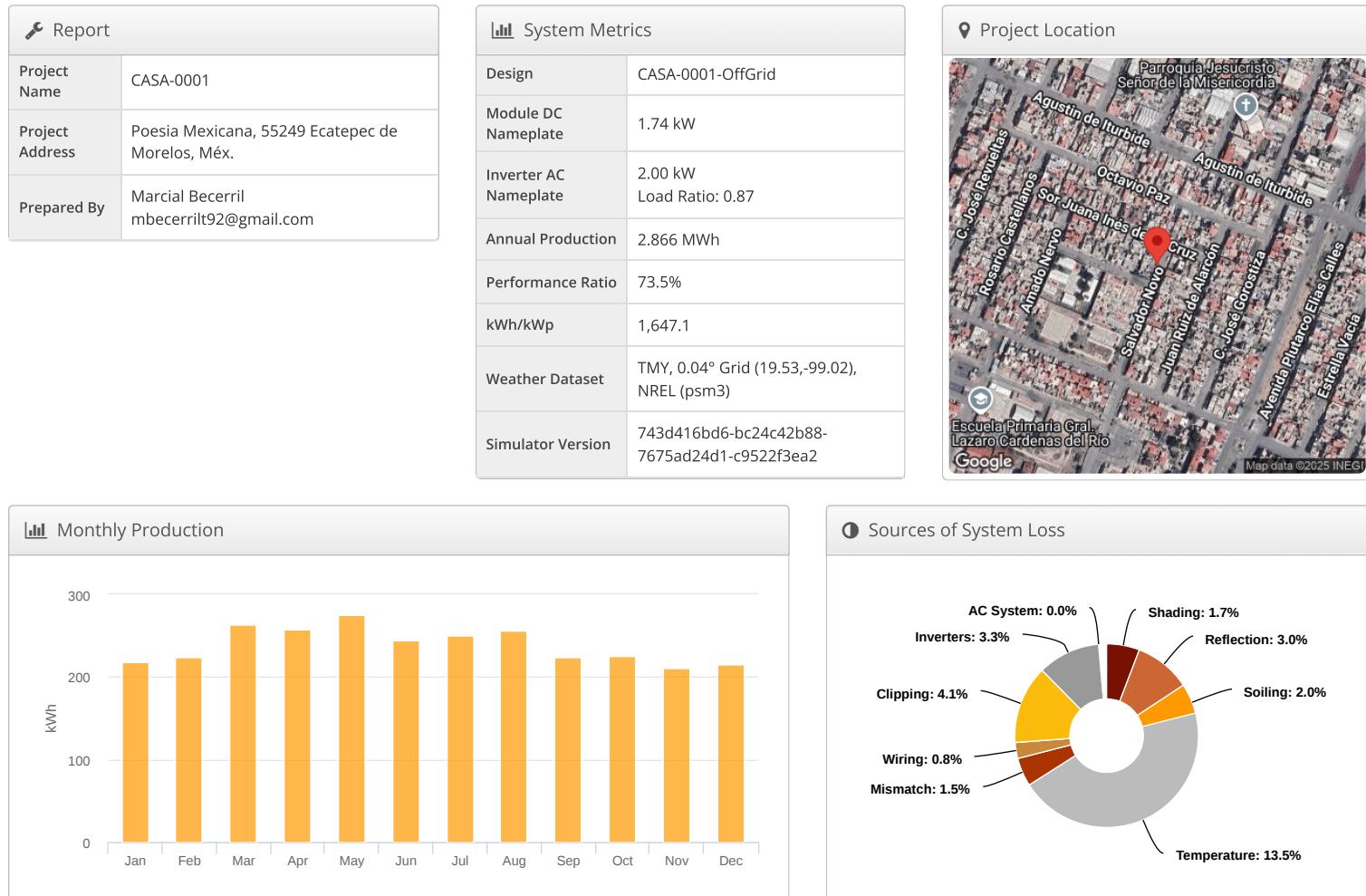
Solar Access by Month

Description	jan	feb	mar	apr	may	jun	jul	aug	sep	oct	nov	dec
Field Segment 1	99%	98%	98%	98%	98%	98%	98%	98%	98%	98%	98%	99%
Solar Access, weighted by kWp	98.7%	98.4%	98.4%	97.9%	98.0%	98.4%	98.2%	98.1%	98.1%	98.1%	98.1%	98.9%
AC Power (kWh)	218.7	224.3	263.0	257.9	274.7	244.0	250.4	256.7	224.4	226.0	210.8	215.1



CASA-0001-OffGrid

CASA-0001, Poesia Mexicana, 55249 Ecatepec de Morelos, Méx.



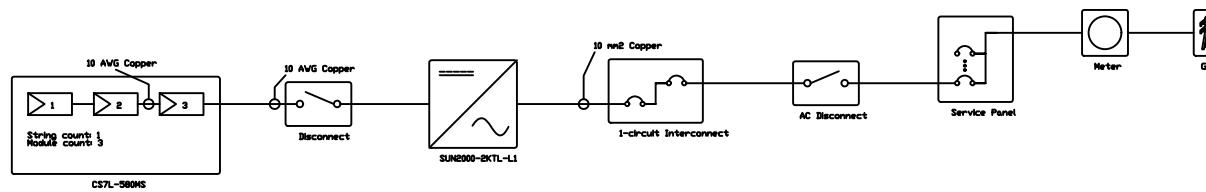
⚡ Annual Production			
	Description	Output	% Delta
Irradiance (kWh/m ²)	Annual Global Horizontal Irradiance	2,241.4	
	POA Irradiance	2,240.8	0.0%
	Shaded Irradiance	2,201.8	-1.7%
	Irradiance after Reflection	2,136.3	-3.0%
	Irradiance after Soiling	2,093.6	-2.0%
Total Collector Irradiance		2,093.4	0.0%
Energy (kWh)	Nameplate	3,642.5	
	Output at Irradiance Levels	3,657.5	0.4%
	Output at Cell Temperature Derate	3,165.2	-13.5%
	Output After Mismatch	3,117.7	-1.5%
	Optimal DC Output	3,091.4	-0.8%
	Constrained DC Output	2,963.9	-4.1%
	Inverter Output	2,866.1	-3.3%
	Energy to Grid	2,866.0	0.0%
Temperature Metrics			
Avg. Operating Ambient Temp		19.3 °C	
Avg. Operating Cell Temp		45.7 °C	
Simulation Metrics			
Operating Hours		4367	
Solved Hours		4367	

☁ Condition Set												
Description	Condition Set 1											
Weather Dataset	TMY, 0.04° Grid (19.53,-99.02), NREL (psm3)											
Solar Angle Location	Meteo Lat/Lng											
Transposition Model	Perez Model											
Temperature Model	Sandia Model											
Temperature Model Parameters	Rack Type			a		b		Temperature Delta				
	Fixed Tilt			-3.56		-0.075		3°C				
	Flush Mount			-2.81		-0.0455		0°C				
	East-West			-3.56		-0.075		3°C				
Soiling (%)	Carport			-3.56		-0.075		3°C				
	J	F	M	A	M	J	J	A	S	O	N	D
	2	2	2	2	2	2	2	2	2	2	2	2
Irradiation Variance	5%											
Cell Temperature Spread	4°C											
Module Binning Range	-2.5% to 2.5%											
AC System Derate	0.50%											
Module Characterizations	Module		Uploaded By		Characterization							
	CS7L-580MS (CSI Solar Co., Ltd.)		HelioScope		CS7L-580MS_CSI_EXT_V7_20_20220524.PAN, PAN							
Component Characterizations	Device				Uploaded By		Characterization					
	SUN2000-2KTL-L1 (Huawei)				HelioScope		Spec Sheet					

📁 Components		
Component	Name	Count
Inverters	SUN2000-2KTL-L1 (Huawei)	1 (2.00 kW)
AC Home Runs	10 mm ² (Copper)	1 (18.0 m)
Strings	10 AWG (Copper)	1 (14.3 m)
Module	CSI Solar Co., Ltd., CS7L-580MS (580W)	3 (1.74 kW)

🏗 Wiring Zones									
Description	Combiner Poles	String Size			Stringing Strategy				
Wiring Zone	-	3-10			Along Racking				
🏢 Field Segments									
Description	Racking	Orientation	Tilt	Azimuth	Intrarow Spacing	Frame Size	Frames	Modules	Power
Field Segment 1	Flush Mount	Landscape (Horizontal)	0°	203°	0.0 m	1x1	3	3	1.74 kW

 Detailed Layout2 HelioScope



Module Specifications	
3x CSI Solar Co, Ltd CS7L-360NS	580 V
STC Rating	580 V
V _{mp}	34.08 V
I _{mp}	17.02 A
V _{oc}	46.5 V
I _{sc}	18.27 A

Inverter Specifications	
1x Huawei SUN2000-2KTL-L1	2 kW
Max AC Power Rating	2 kW
Max Input Voltage	600 V
Min AC Power Rating	0 V
Min Input Voltage	90 V

Wire Schedule		
Tier	Wire	Length
AC Branch	1x 10 mm ²	18m
String	1x 10 AWG	14m