Version 7.3.4

PVsyst - Simulation report

Grid-Connected System

Project: Test Bifi Sheds

Variant: FT30 Az0 (mono)

Sheds, single array

System power: 2558 kWp

Sacramento/McClellan Park - United States

Author
DNV (USA)

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Project summary

Geographical Site
Sacramento/McClellan Park
United States

Situation

Latitude	38.67 °N
Longitude	-121.40 °W
Altitude	18 m
Time zone	UTC-8

Project settings

Albedo	0.20

Meteo data
Sacramento/McClellan Park
MeteoNorm 8.1 station - Synthetic

System summary

Grid-Connected System

Sheds, single array

PV Field Orientation

Fixed plane	
Tilt/Azimuth	30 / 0 °

Near Shadings

According to strings	
Electrical effect	70 %

User's needs
Unlimited load (grid)

System information

PV Array

Nb. of modules	4410 units
Pnom total	2558 kWp

Inverters

Nb. of units	1 unit
Pnom total	2200 kWac
Pnom ratio	1.163

Results summary

Produced Energy	4436353 kWh/year	Specific production	1734 kWh/kWp/year	Perf. Ratio PR	85.04 %

Table of contents

General parameters

Grid-Connected System — **Sheds, single array**

PV Field Orientation

Orientation		Sheds configuration		Models used	
Fixed plane		Nb. of sheds	49 units	Transposition	Perez
Tilt/Azimuth	30 / 0 °	Single array		Diffuse	Perez, Meteonorm
		Sizes		Circumsolar	separate
		Sheds spacing	5.00 m		
		Collector width	2.47 m		
		Ground Cov. Ratio (GCR)	49.3 %		
		Top inactive band	0.02 m		
		Bottom inactive band	0.02 m		
		Shading limit angle			
		Limit profile angle	23.6 °		

Horizon	Near Shadings	User's needs
Free Horizon	According to strings	Unlimited load (grid)
	Electrical effect 70 %	

PV Array Characteristics

PV module

Manufacturer	HT-SAAE
Model	HT78-18X-580 Bifacial
(Original PVsyst database)	
Unit Nom. Power	580 Wp
Number of PV modules	4410 units
Nominal (STC)	2558 kWp
Modules	245 Strings x 18 In series
At operating cond. (50°C)	
Pmpp	2351 kWp
U mpp	731 V
I mpp	3219 A

Inverter

Manufacturer	SMA
Model	Sunny Central 2200
(Original PVsyst database)	
Unit Nom. Power	2200 kWac
Number of inverters	1 unit
Total power	2200 kWac
Operating voltage	570-950 V
Pnom ratio (DC:AC)	1.16

Total PV power

Nominal (STC)	2558 kWp
Total	4410 modules
Module area	12327 m²
Cell area	11351 m²

Total inverter power

Total power	2200 kWac
Number of inverters	1 unit
Pnom ratio	1.16

Array losses

Thermal Loss factor
Module temperature according to irradiance
Uc (const) 25.0 W/m²K
Uv (wind) 1.2 W/m²K/m/s

DC wiring losses
Global array res. 3.7 mΩ
Loss Fraction 1.5 % at STC

LID - Light Induced Degradation
Loss Fraction 1.0 %

Module Quality Loss
Loss Fraction -0.8 %

Module mismatch losses
Loss Fraction 1.0 % at MPP

Strings Mismatch loss
Loss Fraction 0.2 %

IAM loss factor
Incidence effect (IAM): Fresnel smooth glass, n = 1.526

0°	30°	50°	60°	70°	75°	80°	85°	90°
1.000	0.998	0.981	0.948	0.862	0.776	0.636	0.403	0.000

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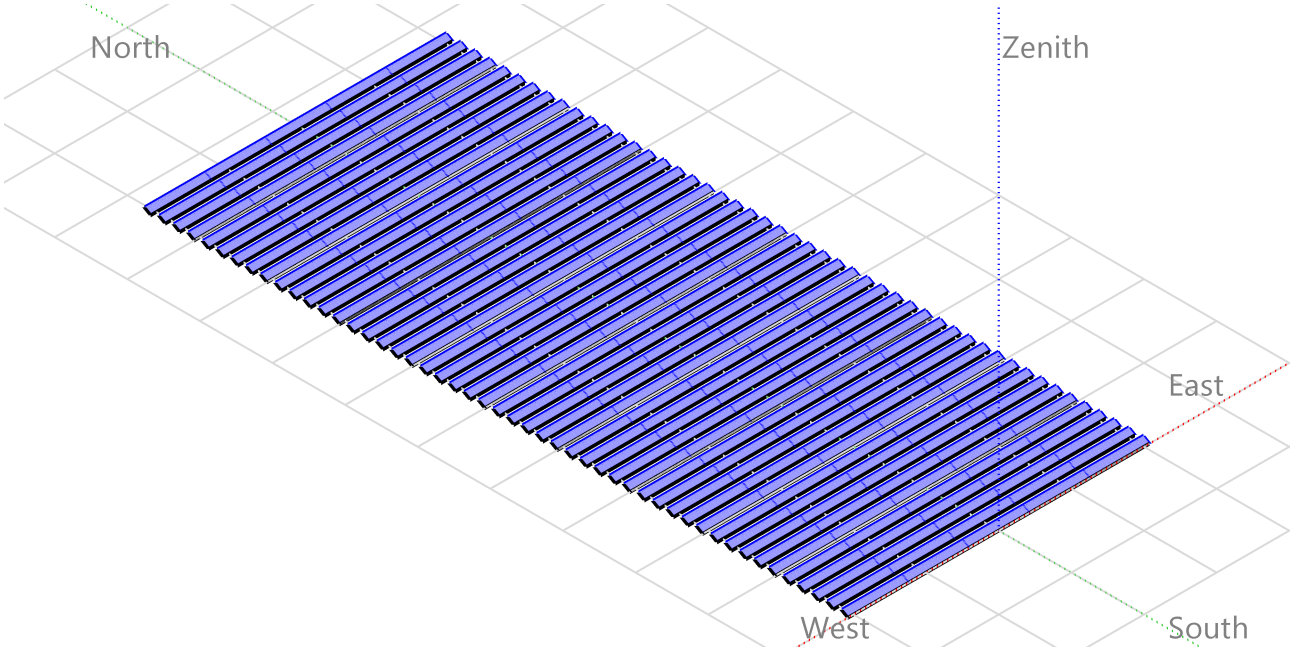
Near shadings parameter

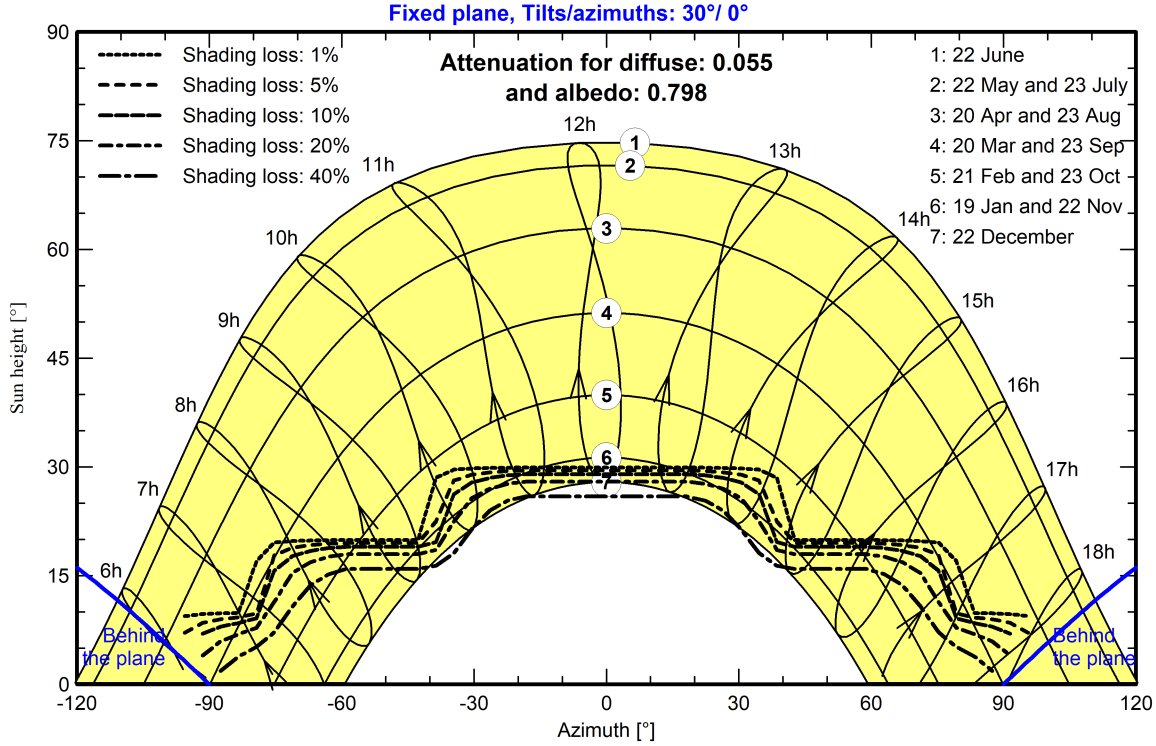
Perspective of the PV-field and surrounding shading scene



Iso-shadings diagram

Orientation #1

Fixed plane, Tilts/azimuths: 30°/ 0°

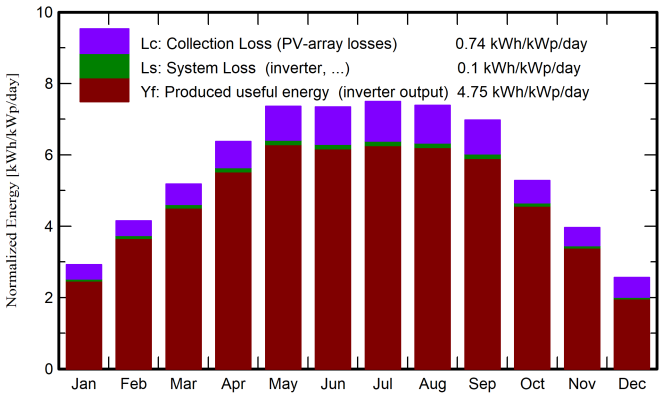


Main results

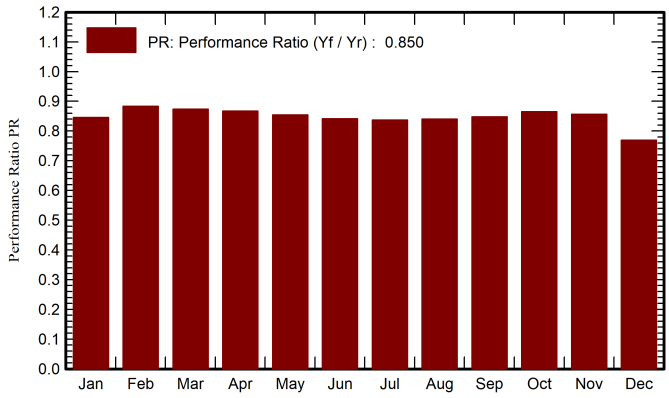
System Production

Produced Energy	4436353 kWh/year	Specific production	1734 kWh/kWp/year
		Perf. Ratio PR	85.04 %

Normalized productions (per installed kWp)



Performance Ratio PR



Balances and main results

	GlobHor kWh/m²	DiffHor kWh/m²	T_Amb °C	GlobInc kWh/m²	GlobEff kWh/m²	EArray kWh	E_Grid kWh	PR ratio
January	61.4	32.80	7.00	90.6	84.3	200280	196038	0.846
February	83.2	36.20	9.10	116.3	110.9	268137	262671	0.883
March	133.6	60.00	12.60	160.5	153.0	365899	358496	0.873
April	176.1	61.40	15.30	191.3	182.3	433224	424555	0.868
May	231.1	61.70	19.70	228.3	217.7	508802	498723	0.854
June	234.9	64.30	23.20	220.3	209.6	483570	474137	0.841
July	241.8	61.00	24.80	232.3	221.4	506951	497107	0.837
August	217.5	51.60	23.70	229.1	219.2	502432	492627	0.841
September	172.8	39.60	20.90	209.1	200.9	462692	453603	0.848
October	119.1	40.70	16.40	163.6	157.0	369309	362079	0.865
November	76.5	30.60	10.40	118.9	112.4	265607	260240	0.856
December	51.3	27.00	6.70	79.4	73.0	159530	156078	0.769
Year	1799.3	566.90	15.85	2039.6	1941.6	4526434	4436353	0.850

Legends

GlobHor	Global horizontal irradiation
DiffHor	Horizontal diffuse irradiation
T_Amb	Ambient Temperature
GlobInc	Global incident in coll. plane
GlobEff	Effective Global, corr. for IAM and shadings
EArray	Effective energy at the output of the array
E_Grid	Energy injected into grid
PR	Performance Ratio

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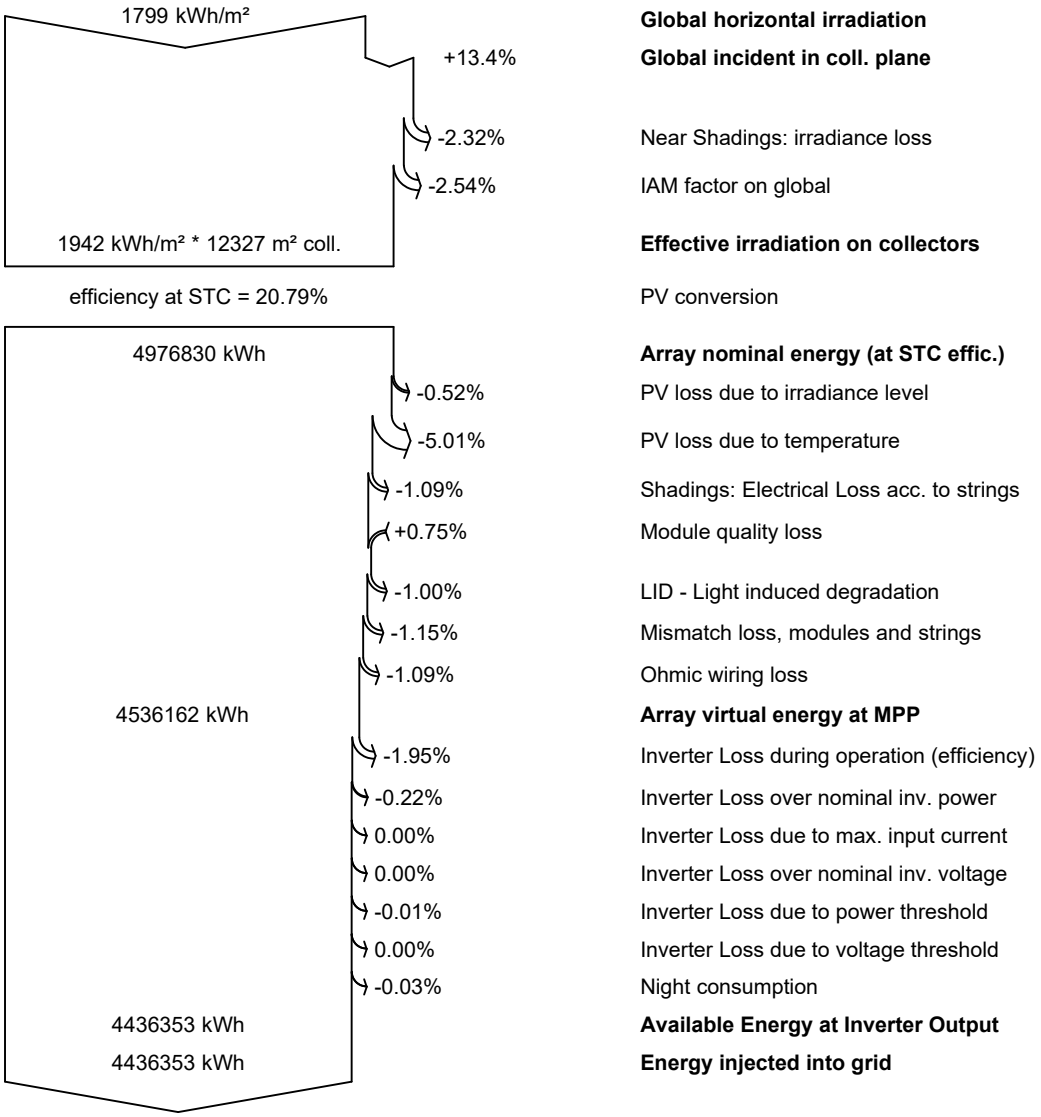
Loss diagram



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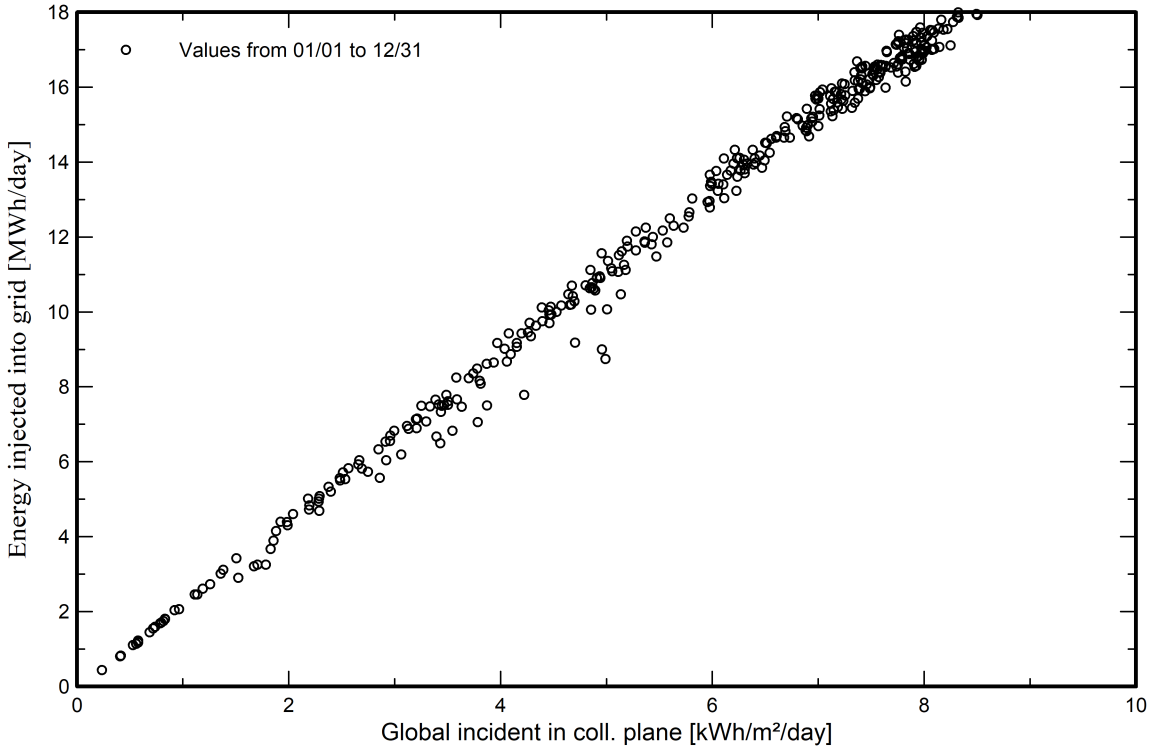
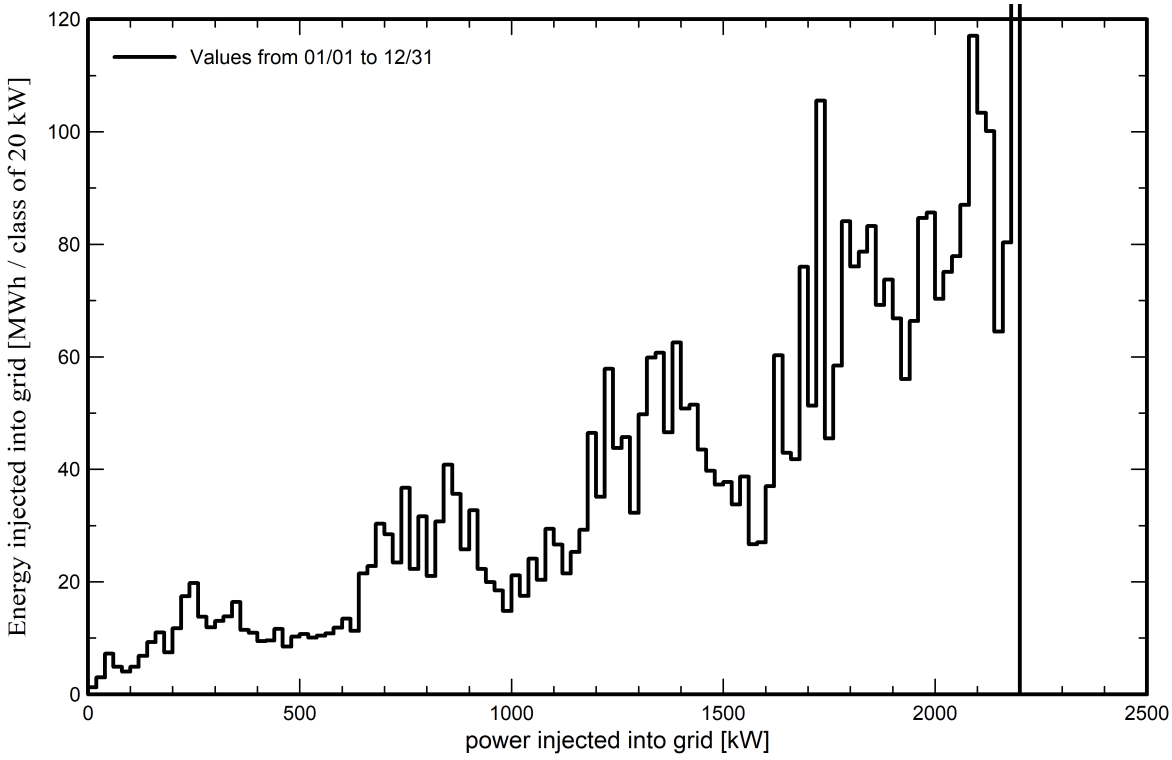
Predef. graphs

Daily Input/Output diagram



System Output Power Distribution



Single-line diagram

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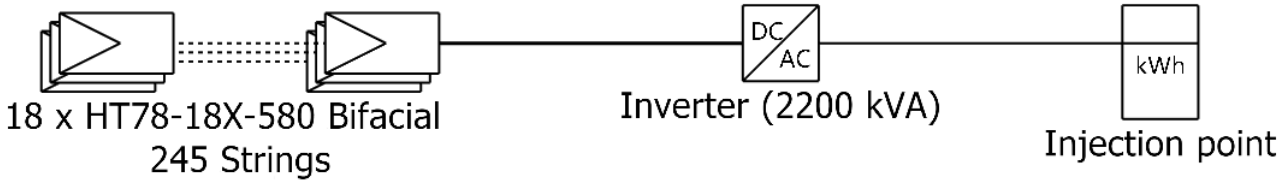

18 x HT78-18X-580 Bifacial
245 Strings

Inverter (2200 kVA)

Injection point

PV module	HT78-18X-580 Bifacial
Inverter	Sunny Central 2200
String	18 x HT78-18X-580 Bifacial

	Test Bifi Sheds	DNV (USA)
	VC0 : FT30 Az0 (mono)	12/28/23