Version 7.3.4

PVsyst - Simulation report

Grid-Connected System

Project: Test Bifi SAT

Variant: SAT Alb020 (mono)
Trackers single array, with backtracking
System power: 2558 kWp
Sacramento/McClellan Park - United States

Author
DNV (USA)

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with v7.3.4

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

Trackers single array, with backtracking

PV Field Orientation
Orientation
Tracking plane, horizontal N-S axis
Axis azimuth 0 °

Tracking algorithm
Astronomic calculation
Backtracking activated

Near Shadings
Linear shadings
Diffuse shading Automatic

System information

PV Array		Inverters	
Nb. of modules	4410 units	Nb. of units	1 unit
Pnom total	2558 kWp	Pnom total	2200 kWac
		Pnom ratio	1.163

User's needs
Unlimited load (grid)

Results summary

Produced Energy	5185307 kWh/year	Specific production	2027 kWh/kWp/year	Perf. Ratio PR	86.93 %

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General parameters

Grid-Connected System — **Trackers single array, with backtracking**

PV Field Orientation

Orientation		Tracking algorithm		Backtracking array	
Tracking plane, horizontal N-S axis		Astronomic calculation		Nb. of trackers	49 units
Axis azimuth	0 °	Backtracking activated		Single array	
				Sizes	
				Tracker Spacing	5.00 m
				Collector width	2.47 m
				Ground Cov. Ratio (GCR)	49.3 %
				Phi min / max.	-/+ 60.0 °
				Backtracking strategy	
				Phi limits for BT	-/+ 60.3 °
				Backtracking pitch	5.00 m
				Backtracking width	2.47 m

Models used

Transposition	Perez
Diffuse	Perez, Meteonorm
Circumsolar	separate

Horizon	Near Shadings	User's needs
Free Horizon	Linear shadings	Unlimited load (grid)
	Diffuse shading Automatic	

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 %

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Array losses

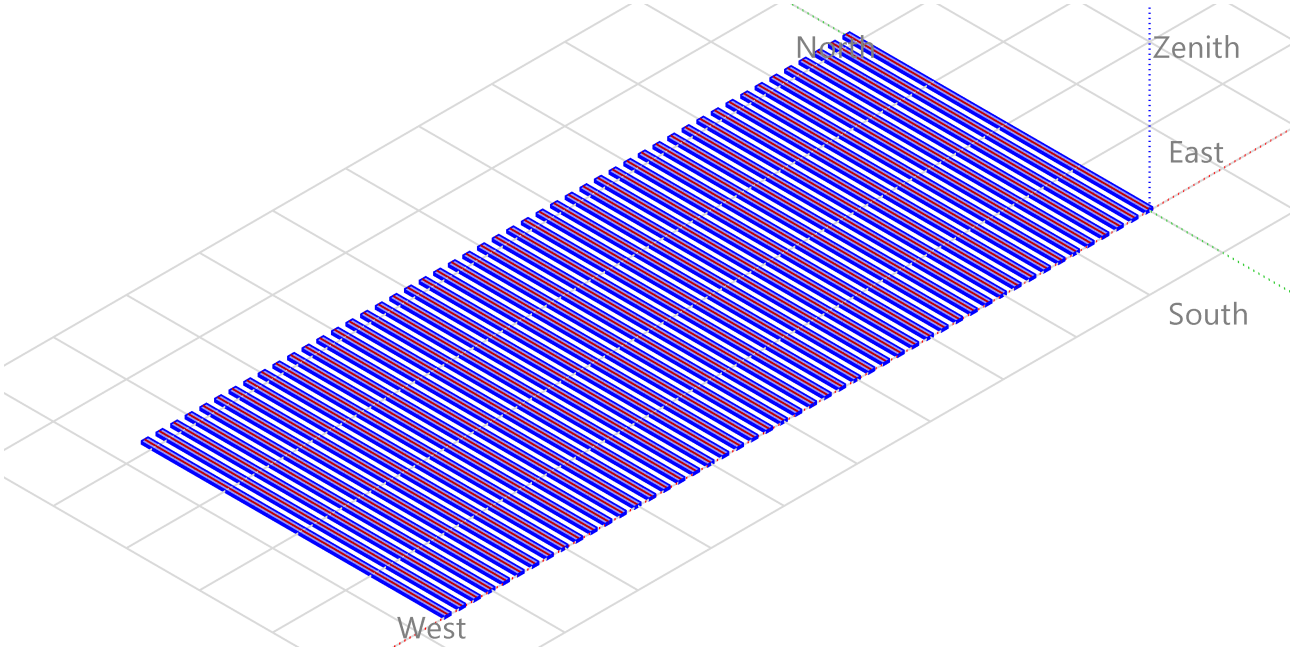
IAM loss factor

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

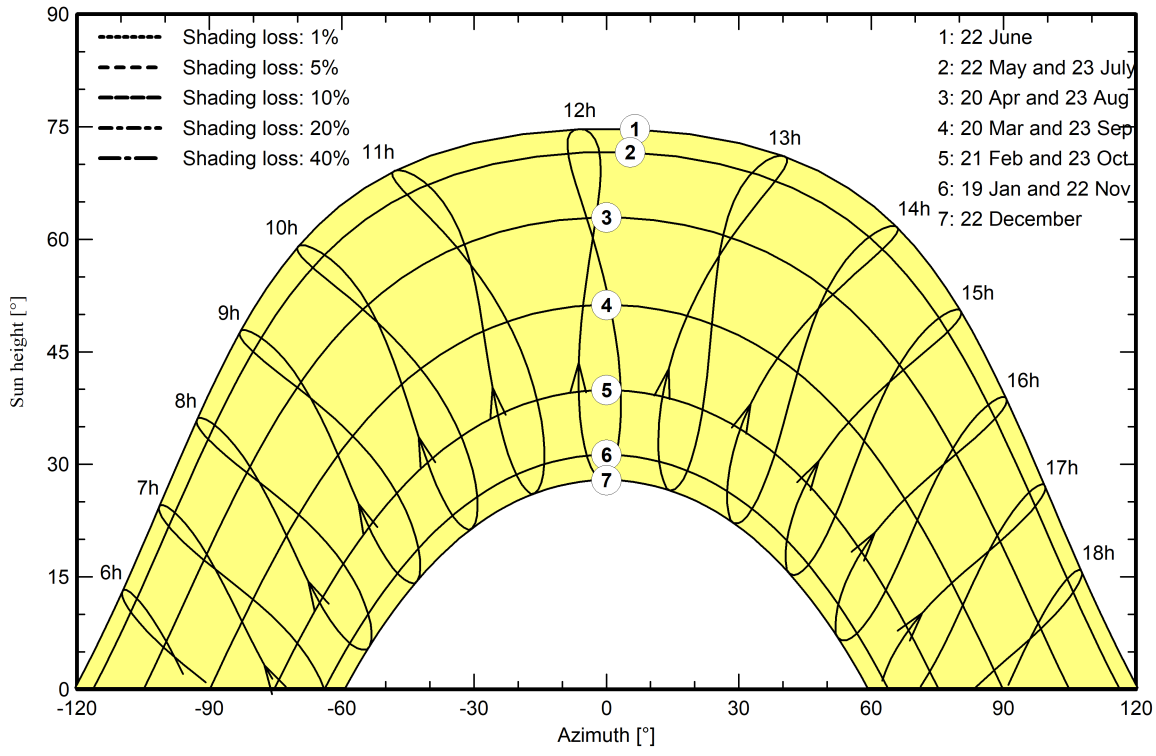
Near shadings parameter

Perspective of the PV-field and surrounding shading scene



Iso-shadings diagram

Orientation #1



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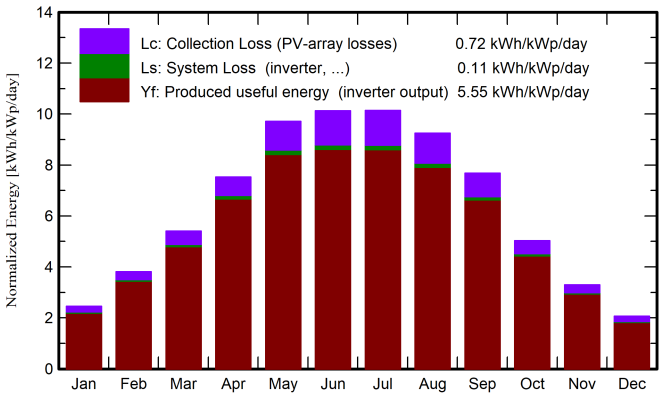
Main results

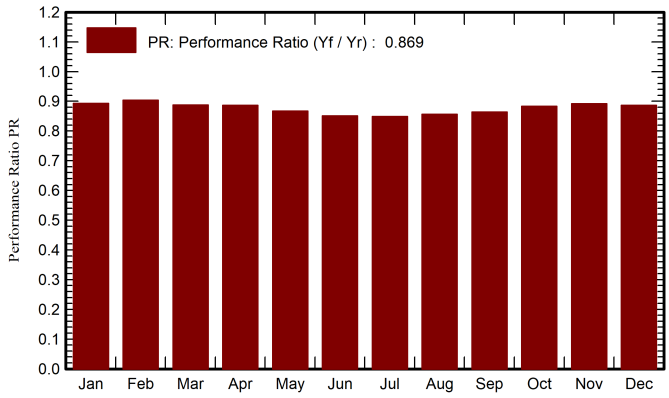
System Production

Produced Energy	5185307 kWh/year	Specific production	2027 kWh/kWp/year
		Perf. Ratio PR	86.93 %

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	76.3	71.1	177930	174197	0.893
February	83.2	36.20	9.10	106.7	101.3	251533	246560	0.904
March	133.6	60.00	12.60	167.6	160.6	388204	380536	0.888
April	176.1	61.40	15.30	225.8	218.7	522463	512108	0.887
May	231.1	61.70	19.70	301.1	293.3	681356	667733	0.867
June	234.9	64.30	23.20	304.0	295.8	674633	661307	0.850
July	241.8	61.00	24.80	314.5	306.6	696622	682954	0.849
August	217.5	51.60	23.70	286.8	279.9	640489	628040	0.856
September	172.8	39.60	20.90	230.5	223.7	519222	509244	0.864
October	119.1	40.70	16.40	155.8	149.4	358670	351872	0.883
November	76.5	30.60	10.40	99.0	93.2	230336	225790	0.892
December	51.3	27.00	6.70	63.9	59.1	148189	144966	0.887
Year	1799.3	566.90	15.85	2332.1	2252.8	5289647	5185307	0.869

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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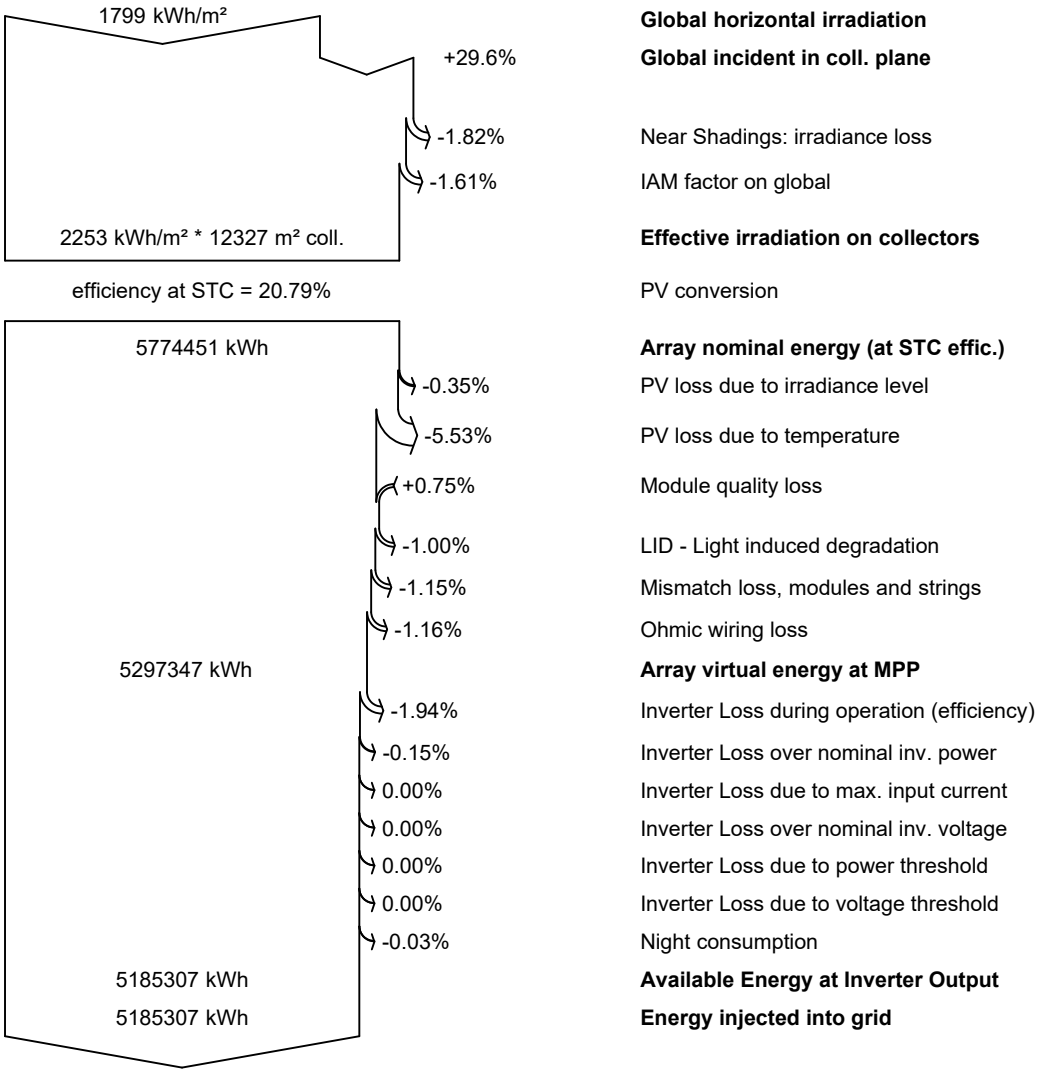
Loss diagram



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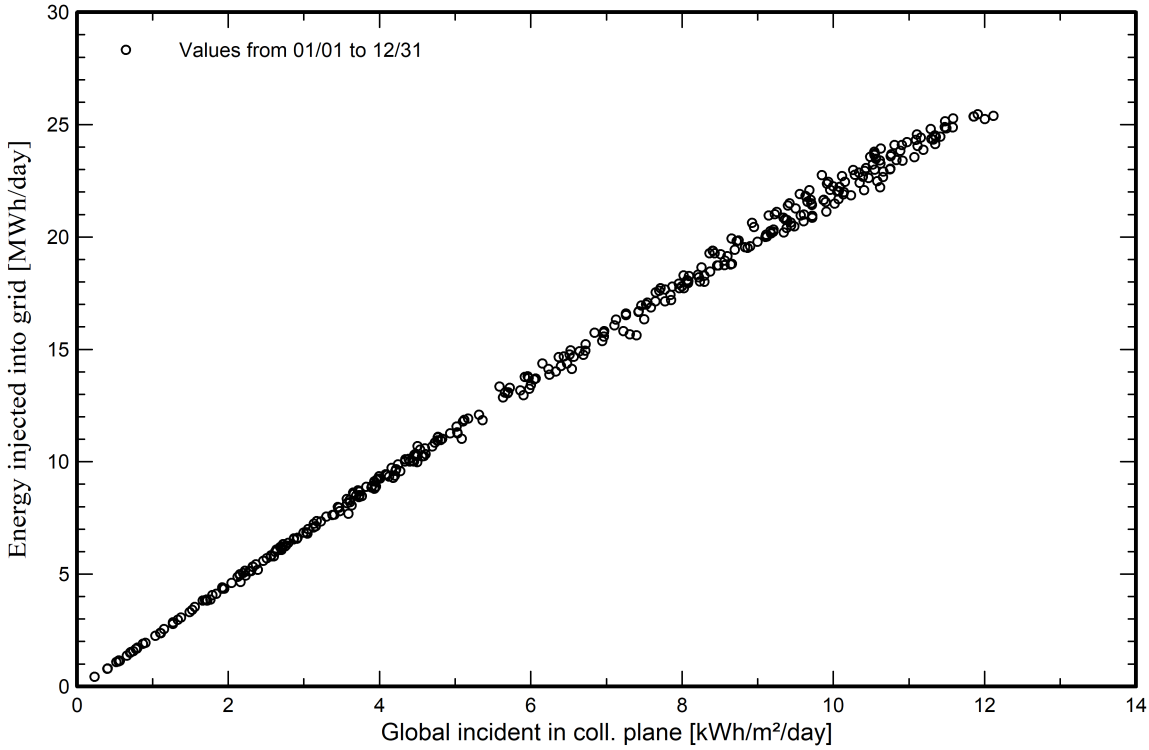
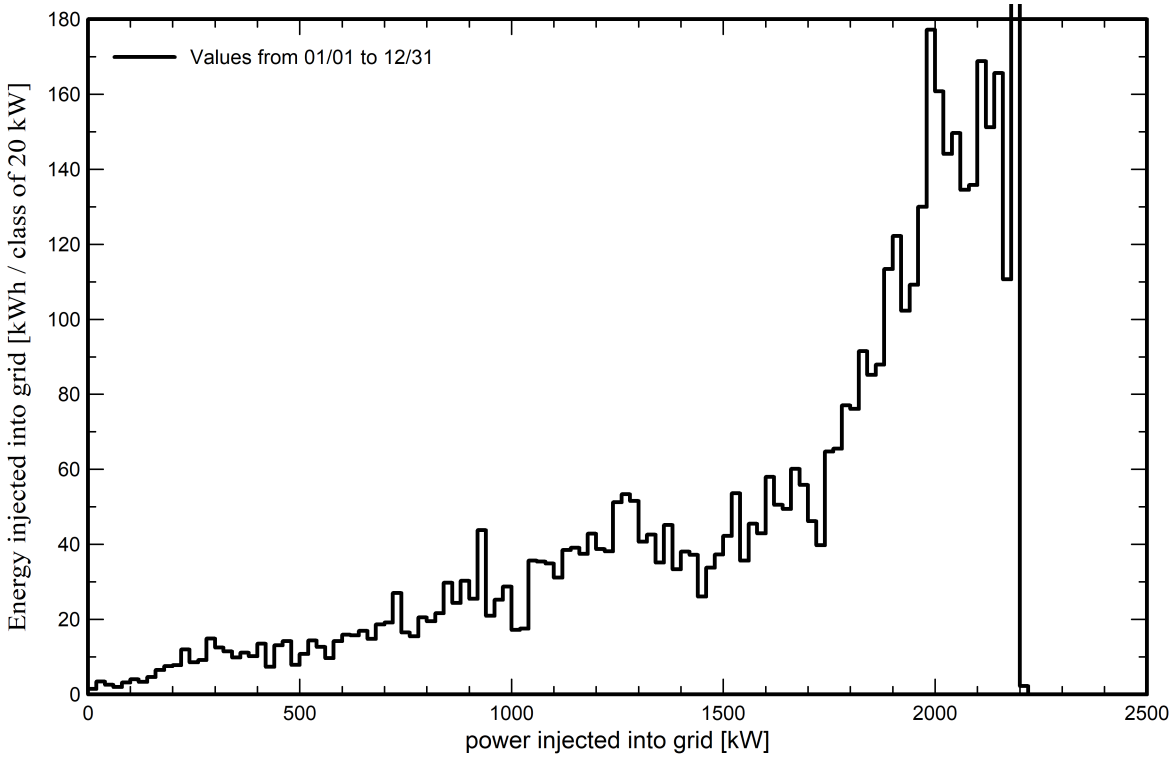
Predef. graphs

Daily Input/Output diagram



System Output Power Distribution



Single-line diagram

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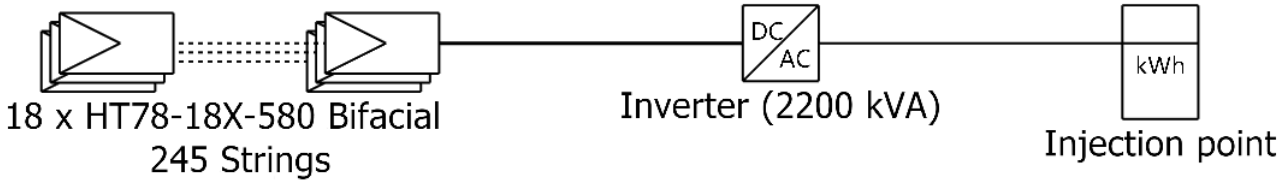

PV module	HT78-18X-580 Bifacial
Inverter	Sunny Central 2200
String	18 x HT78-18X-580 Bifacial

	Test Bifi SAT	DNV (USA)
	VC0 : SAT Alb020 (mono)	12/28/23