

PVsyst - Simulation report

Standalone system

Project: Ev_Charging

Variant: New simulation variant

Standalone system with batteries

System power: 35.1 kWp

Azad maidan EV station - India

Author



PVsyst V7.3.4

VC0, Simulation date:
06/22/23 22:59
with v7.3.4

Project summary

Geographical Site

Azad maidan EV station

India

Situation

Latitude 26.44 °N

Longitude 80.31 °E

Altitude 130 m

Time zone UTC+5.5

Project settings

Albedo 0.20

Meteo data

Azad maidan EV station

Meteonorm 8.1 (1996-2015), Sat=100% - Synthetic

System summary

Standalone system

PV Field Orientation

Fixed plane

Tilt/Azimuth 20 / 0 °

Standalone system with batteries

User's needs

Fixed constant load

4167 W

Global

36.5 MWh/Year

System information

PV Array

Nb. of modules

108 units

Pnom total

35.1 kWp

Battery pack

Technology

Lithium-ion, LFP

Nb. of units

63 units

Voltage

230 V

Capacity

1260 Ah

Results summary

Useful energy from solar 35966 kWh/year

Specific production 1025 kWh/kWp/year

Perf. Ratio PR 60.72 %

Missing Energy 534 kWh/year

Available solar energy 47565 kWh/year

Solar Fraction SF 98.54 %

Excess (unused) 10165 kWh/year

Table of contents

Project and results summary	2
General parameters, PV Array Characteristics, System losses	3
Main results	5
Loss diagram	6
Predef. graphs	7



PVsyst V7.3.4

VC0, Simulation date:
06/22/23 22:59
with v7.3.4

General parameters

Standalone system

PV Field Orientation

Orientation

Fixed plane
Tilt/Azimuth 20 / 0 °

User's needs

Fixed constant load
4167 W
Global
36.5 MWh/Year

Standalone system with batteries

Sheds configuration

No 3D scene defined

Models used

Transposition Perez
Diffuse Perez, Meteonorm
Circumsolar separate

PV Array Characteristics

PV module

Manufacturer Generic
Model AS-P727-325
(Original PVsyst database)

Unit Nom. Power 325 Wp
Number of PV modules 108 units
Nominal (STC) 35.1 kWp
Modules 6 Strings x 18 In series

At operating cond. (50°C)

Pmpp 31.6 kWp
U mpp 605 V
I mpp 52 A

Controller

Universal controller
Technology MPPT converter
Temp coeff. -5.0 mV/°C/Elem.

Converter

Maxi and EURO efficiencies 97.0 / 95.0 %

Total PV power

Nominal (STC) 35 kWp
Total 108 modules
Module area 210 m²

Battery

Manufacturer Generic
Model LFP-CB 25.6V / 180Ah
Technology Lithium-ion, LFP
Nb. of units 7 in parallel x 9 in series
Discharging min. SOC 10.0 %
Stored energy 255.0 kWh

Battery Pack Characteristics

Voltage 230 V
Nominal Capacity 1260 Ah (C10)
Temperature External ambient temperature

Battery Management control

Threshold commands as SOC calculation
Charging SOC = 0.96 / 0.80
Discharging SOC = 0.10 / 0.35

Array losses

Array Soiling Losses

Loss Fraction 3.0 %

Thermal Loss factor

Module temperature according to irradiance
Uc (const) 29.0 W/m²K
Uv (wind) 0.0 W/m²K/m/s

DC wiring losses

Global array res. 195 mΩ
Loss Fraction 1.5 % at STC

Serie Diode Loss

Voltage drop 0.7 V
Loss Fraction 0.1 % at STC

LID - Light Induced Degradation

Loss Fraction 2.0 %

Module Quality Loss

Loss Fraction -0.8 %

Module mismatch losses

Loss Fraction 2.0 % at MPP

Strings Mismatch loss

Loss Fraction 0.1 %



PVsyst V7.3.4

VC0, Simulation date:
06/22/23 22:59
with v7.3.4

Array losses

IAM loss factor

Incidence effect (IAM): Fresnel, AR coating, $n(\text{glass})=1.526$, $n(\text{AR})=1.290$

0°	30°	50°	60°	70°	75°	80°	85°	90°
1.000	0.999	0.987	0.962	0.892	0.816	0.681	0.440	0.000

Spectral correction

FirstSolar model

Precipitable water estimated from relative humidity

Coefficient Set	C0	C1	C2	C3	C4	C5
Polycrystalline Si	0.8409	-0.027539	-0.0079224	0.1357	0.038024	-0.0021218



PVsyst V7.3.4

VC0, Simulation date:
06/22/23 22:59
with v7.3.4

Main results

System Production

Useful energy from solar 35966 kWh/year
Available solar energy 47565 kWh/year
Excess (unused) 10165 kWh/year

Perf. Ratio PR 60.72 %
Solar Fraction SF 98.54 %

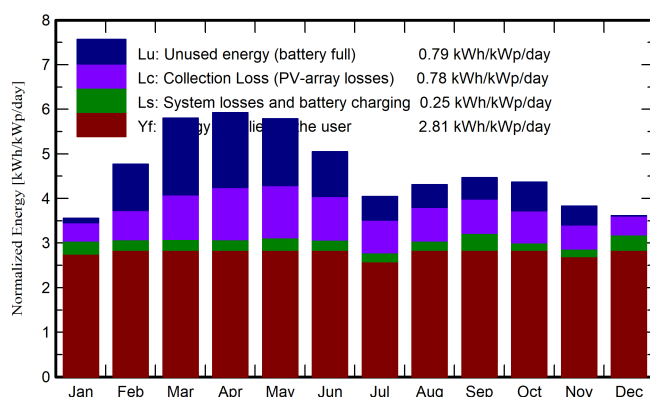
Loss of Load

Time Fraction 1.5 %
Missing Energy 534 kWh/year

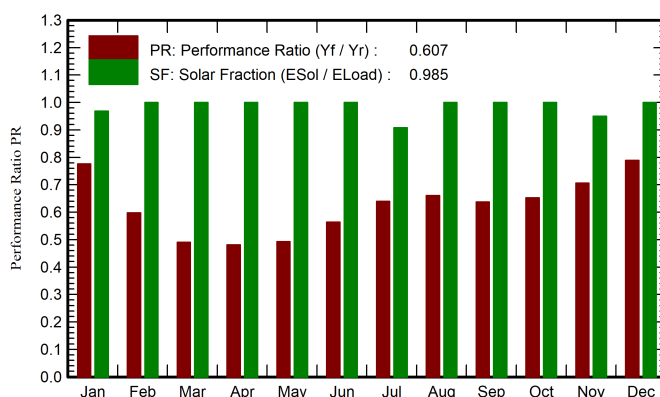
Battery aging (State of Wear)

Cycles SOW 93.8 %
Static SOW 87.0 %

Normalized productions (per installed kWp)



Performance Ratio PR



Balances and main results

	GlobHor	GlobEff	E_Avail	EUnused	E_Miss	E_User	E_Load	SolFrac
	kWh/m ²	kWh/m ²	kWh	kWh	kWh	kWh	kWh	ratio
January	91.9	104.7	3282	104	96.7	3003	3100	0.969
February	113.9	126.9	3918	1011	0.0	2800	2800	1.000
March	163.5	171.1	5094	1868	0.0	3100	3100	1.000
April	173.4	168.8	4873	1760	0.0	3000	3000	1.000
May	184.9	170.1	4884	1623	0.0	3100	3100	1.000
June	159.5	143.4	4147	1051	0.0	3000	3000	1.000
July	130.9	118.5	3435	569	285.9	2814	3100	0.908
August	135.4	126.4	3710	549	0.0	3100	3100	1.000
September	128.1	126.9	3741	498	0.0	3000	3000	1.000
October	121.7	128.7	3835	698	0.0	3100	3100	1.000
November	95.6	109.1	3327	433	151.8	2848	3000	0.949
December	90.0	106.1	3319	0	0.0	3100	3100	1.000
Year	1588.8	1600.7	47565	10165	534.4	35966	36500	0.985

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

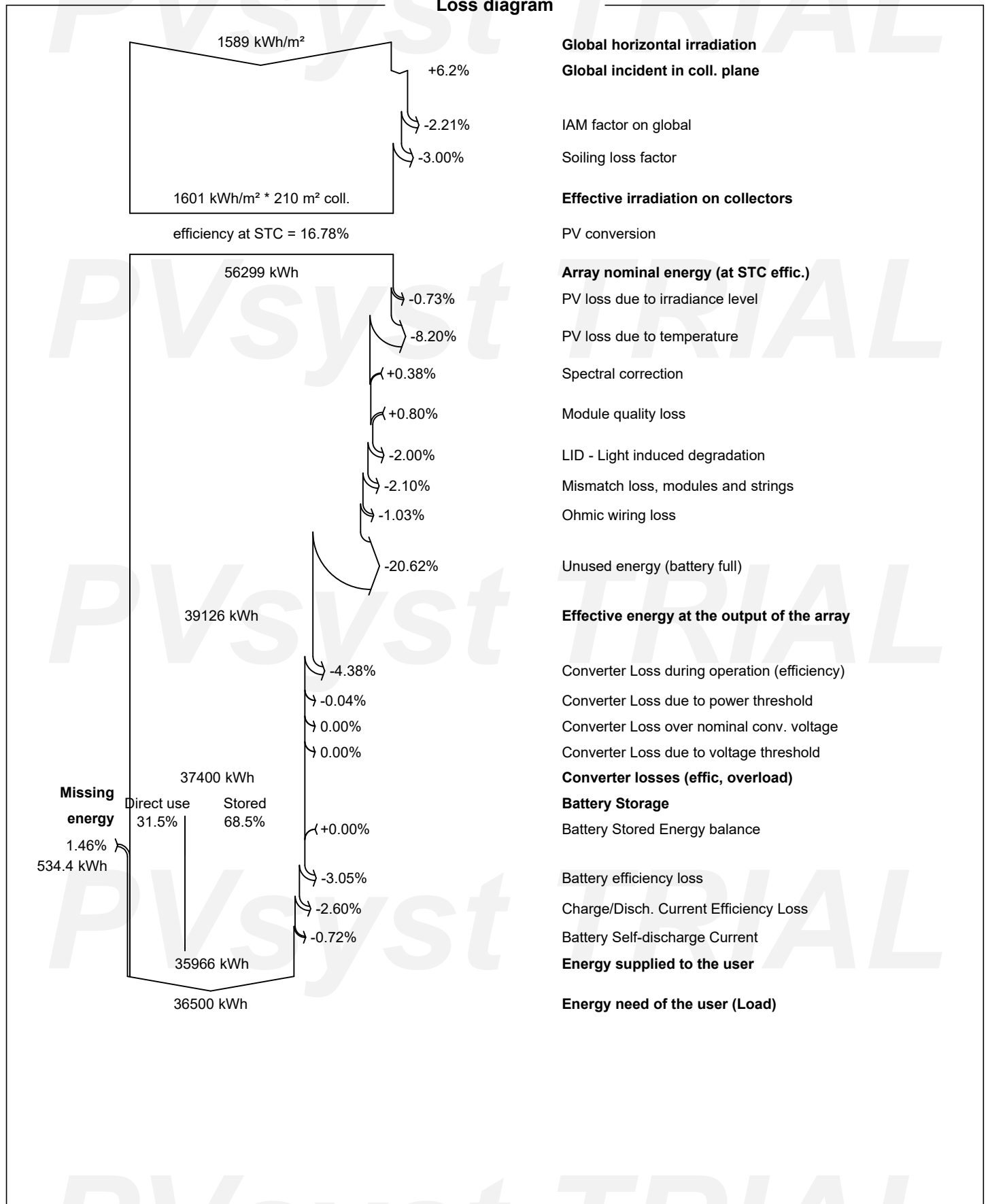
E_User Energy supplied to the user
E_Load Energy need of the user (Load)
SolFrac Solar fraction (EUsed / ELoad)



PVsyst V7.3.4

VC0, Simulation date:
06/22/23 22:59
with v7.3.4

Loss diagram





PVsyst V7.3.4

VC0, Simulation date:
06/22/23 22:59
with v7.3.4

Predef. graphs

Daily Input/Output diagram

