PVSYST
PHOTOVOLTAIC SOFTWARE

PVsyst - Simulation report

Grid-Connected System

Project: KyaSolarSahiHain?

Variant: kyasolarsahihai_first_sim

No 3D scene defined, no shadings

System power: 3240 Wp

Home - India

Author

PVsyst V8.0.13
VC0, Simulation date:
22/06/25 14:25
with V8.0.13

Project summary

Geographical Site
Home
India

Situation

Latitude	26.44 °(N)
Longitude	91.41 °(E)
Altitude	55 m
Time zone	UTC+5.5

Project settings

Albedo	0.20

Weather data
home
Meteonorm 8.2 (1992-2000), Sat=100% - Synthetic

System summary

Grid-Connected System

No 3D scene defined, no shadings

Orientation #1
Fixed plane
Tilt/Azimuth 22 / 0 °

Near Shadings
no Shadings

User's needs
Daily household consumers
Seasonal modulation
Average 11.0 kWh/Day

System information

PV Array

Nb. of modules	6 units
Pnom total	3240 Wp

Inverters

Nb. of units	1 unit
Total power	3 kWac
Pnom ratio	1.08

Results summary

Produced Energy	3992.0 kWh/year	Specific production	1232 kWh/kWp/year	Perf. Ratio PR	79.07 %
Used Energy	4004.0 kWh/year			Solar Fraction SF	53.43 %

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General parameters

Grid-Connected System — **No 3D scene defined, no shadings**

Orientation #1
Fixed plane
Tilt/Azimuth 22 / 0 °

Models used
Transposition Perez
Diffuse Perez, Meteonorm
Circumsolar separate

Horizon
Free Horizon

Near Shadings
no Shadings

User's needs
Daily household consumers
Seasonal modulation
Average 11.0 kWh/Day

PV Array Characteristics

PV module

Manufacturer	Generic
Model	WSMD-540
(Original PVsyst database)	
Unit Nom. Power	540 Wp
Number of PV modules	6 units
Nominal (STC)	3240 Wp
Modules	1 strings x 6 In series
At operating cond. (50°C)	
Pmpp	2963 Wp
U mpp	225 V
I mpp	13 A

Inverter

Manufacturer	Generic
Model	SG3.0RT-P2
(Original PVsyst database)	
Unit Nom. Power	3.00 kWac
Number of inverters	1 unit
Total power	3.0 kWac
Operating voltage	160-1000 V
Pnom ratio (DC:AC)	1.08
Power sharing within this inverter	

Total PV power

Nominal (STC)	3.24 kWp
Total	6 modules
Module area	15.4 m²

Total inverter power

Total power	3 kWac
Number of inverters	1 unit
Pnom ratio	1.08

Array losses

Array Soiling Losses
Loss Fraction 2.0 %

Thermal Loss factor
Module temperature according to irradiance
Uc (const) 20.0 W/m²K
Uv (wind) 0.0 W/m²K/m/s

DC wiring losses
Global array res. 282 mΩ
Loss Fraction 1.50 % at STC

Module Quality Loss
Loss Fraction -0.50 %

Module mismatch losses
Loss Fraction 2.00 % at MPP

Strings Mismatch loss
Loss Fraction 0.15 %

IAM loss factor
Incidence effect (IAM): Fresnel, AR coating, n(glass)=1.526, n(AR)=1.290

0°	30°	50°	60°	70°	75°	80°	85°	90°
1.000	0.999	0.987	0.963	0.892	0.814	0.679	0.438	0.000

System losses

Auxiliaries loss
constant (fans) 4 W
0.0 kW from Power thresh.

Detailed User's needs

Daily household consumers, Seasonal modulation, average = 11.0 kWh/day

Summer (Jun-Aug)

	Nb.	Power	Use	Energy
		W	Hour/day	Wh/day
Lamps (LED or fluo)	10	10/lamp	5.0	500
TV / PC / Mobile	2	100/app	5.0	1000
Domestic appliances	1	500/app	4.0	2000
Fridge / Deep-freeze	2		24	1598
Dish- & Cloth-washers	1		2	2000
Ventilation	1	100 tot	24.0	2400
Air conditioning	1	1000 tot	3.0	3000
Stand-by consumers			24.0	144
Total daily energy				12642

Autumn (Sep-Nov)

	Nb.	Power	Use	Energy
		W	Hour/day	Wh/day
Lamps (LED or fluo)	10	10/lamp	5.0	500
TV / PC / Mobile	2	100/app	5.0	1000
Domestic appliances	1	500/app	5.0	2500
Fridge / Deep-freeze	2		24	1598
Dish- & Cloth-washers	1		2	2000
Ventilation	1	100 tot	24.0	2400
Stand-by consumers			24.0	144
Total daily energy				10142

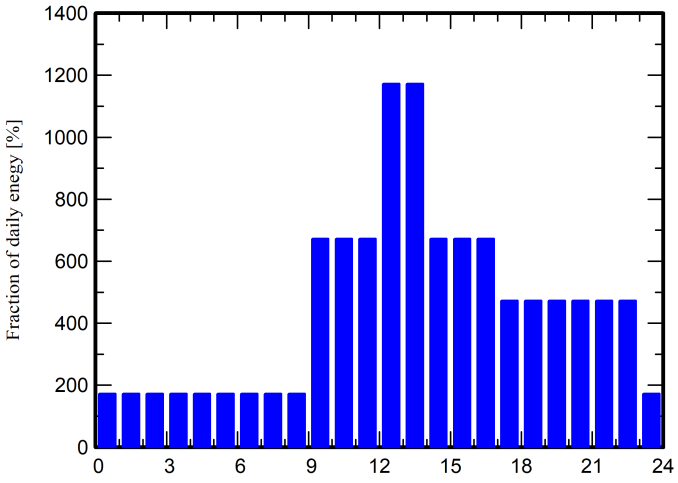
Winter (Dec-Feb)

	Nb.	Power	Use	Energy
		W	Hour/day	Wh/day
Lamps (LED or fluo)	10	10/lamp	6.0	600
TV / PC / Mobile	2	100/app	6.0	1200
Domestic appliances	1	500/app	6.0	3000
Fridge / Deep-freeze	2		24	1598
Dish- & Cloth-washers	1		2	2000
Ventilation	1	100 tot	24.0	2400
Stand-by consumers			24.0	144
Total daily energy				10942

Spring (Mar-May)

	Nb.	Power	Use	Energy
		W	Hour/day	Wh/day
Lamps (LED or fluo)	10	10/lamp	5.0	500
TV / PC / Mobile	2	100/app	5.0	1000
Domestic appliances	1	500/app	5.0	2500
Fridge / Deep-freeze	2		24	1598
Dish- & Cloth-washers	1		2	2000
Ventilation	1	100 tot	24.0	2400
Stand-by consumers			24.0	144
Total daily energy				10142

Hourly distribution



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Main results

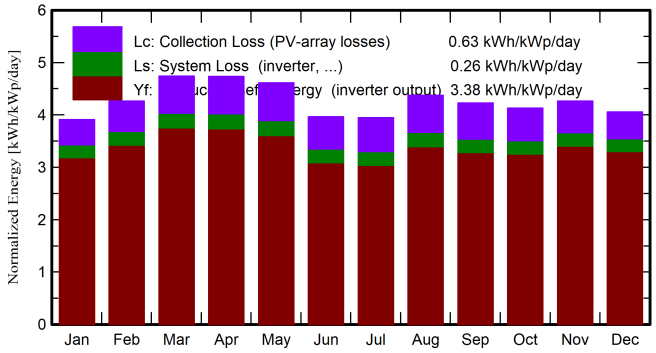
System Production

Produced Energy	3992.0 kWh/year	Specific production	1232 kWh/kWp/year
Used Energy	4004.0 kWh/year	Perf. Ratio PR	79.07 %
		Solar Fraction SF	53.43 %

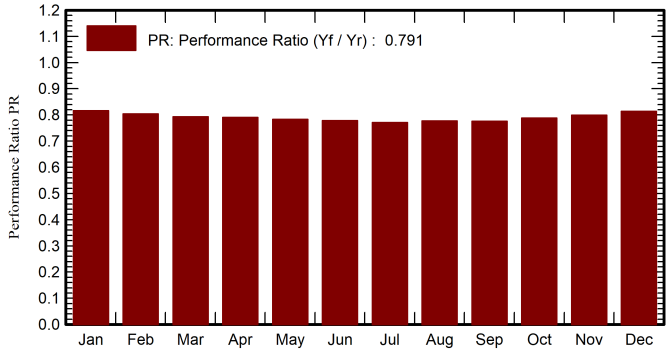
Economic evaluation

Investment		Yearly cost		LCOE	
Global	138,000.00 INR	Annuities	0.00 INR/yr	Energy cost	-17.8 INR/kWh
Specific	42.6 INR/Wp	Run. costs	-78,000.00 INR/yr		
		Payback period	1.5 years		

Normalized productions (per installed kWp)



Performance Ratio PR



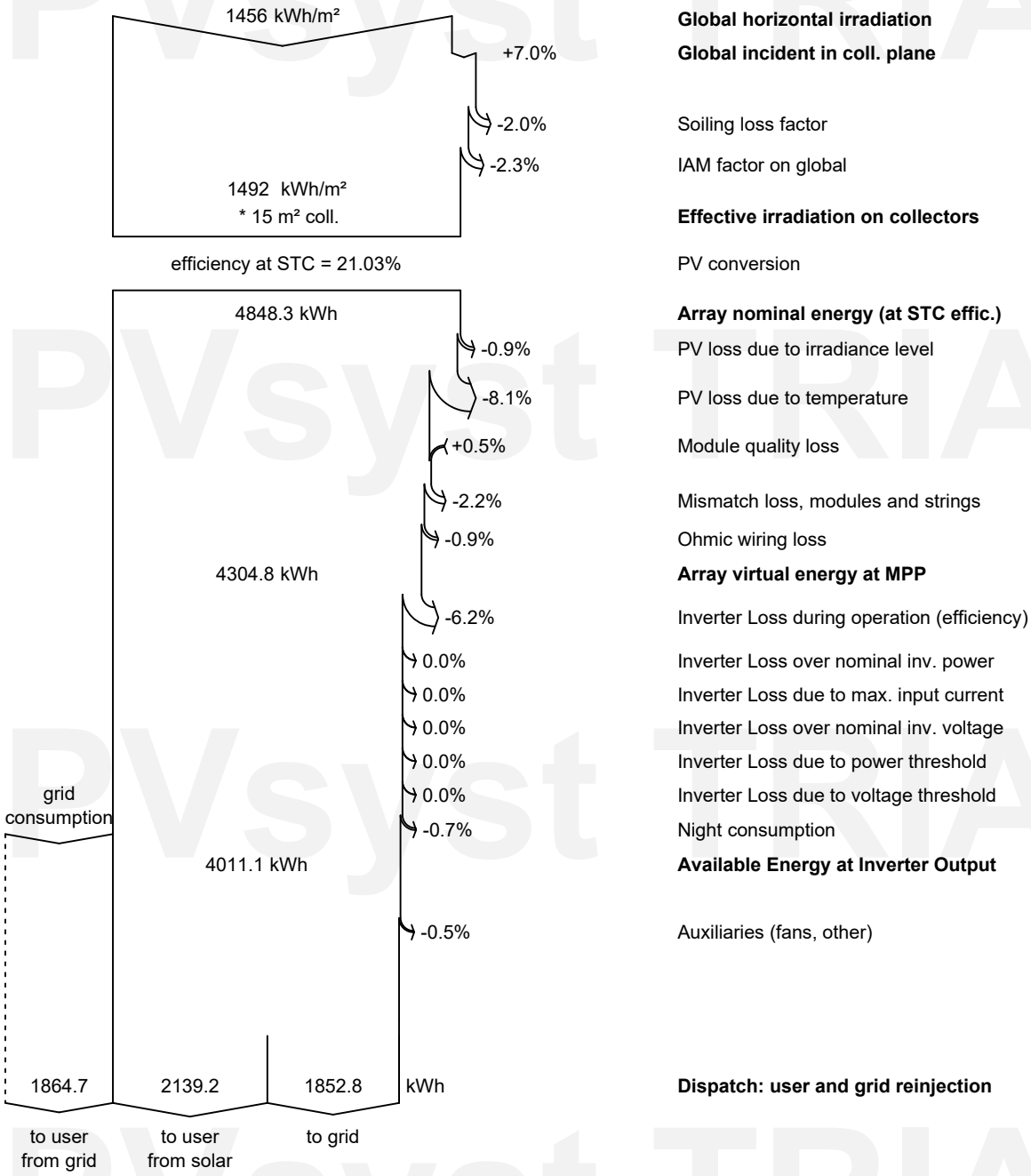
Balances and main results

	GlobHor kWh/m²	DiffHor kWh/m²	T_Amb °C	GlobInc kWh/m²	GlobEff kWh/m²	EArray kWh	E_User kWh	E_Solar kWh	E_Grid kWh	EFrGrid kWh
January	96.8	48.45	17.16	121.2	116.7	345.1	339.2	164.6	156.0	174.6
February	102.1	56.98	19.91	119.4	114.6	334.7	306.4	163.9	147.1	142.5
March	136.3	81.68	23.73	147.0	140.9	405.5	314.4	187.2	190.3	127.2
April	141.0	89.26	25.17	142.0	135.9	391.0	304.3	178.4	185.1	125.9
May	149.3	97.99	27.27	143.0	136.6	391.4	314.4	187.7	175.2	126.7
June	127.3	87.64	28.25	119.0	113.4	326.0	379.3	195.7	104.6	183.6
July	130.4	81.76	29.05	122.4	116.5	332.2	391.9	194.3	111.5	197.6
August	138.2	89.40	29.29	135.6	129.4	368.6	391.9	209.5	131.7	182.5
September	120.9	67.97	28.04	126.9	121.6	344.7	304.3	158.4	160.9	145.9
October	114.6	70.13	26.57	128.1	122.8	352.6	314.4	170.0	157.0	144.4
November	102.9	50.34	22.32	128.0	123.0	356.4	304.3	162.5	168.9	141.8
December	96.6	46.29	18.82	125.8	121.1	356.6	339.2	167.2	164.5	172.0
Year	1456.4	867.89	24.66	1558.3	1492.4	4304.8	4004.0	2139.2	1852.8	1864.7

Legends

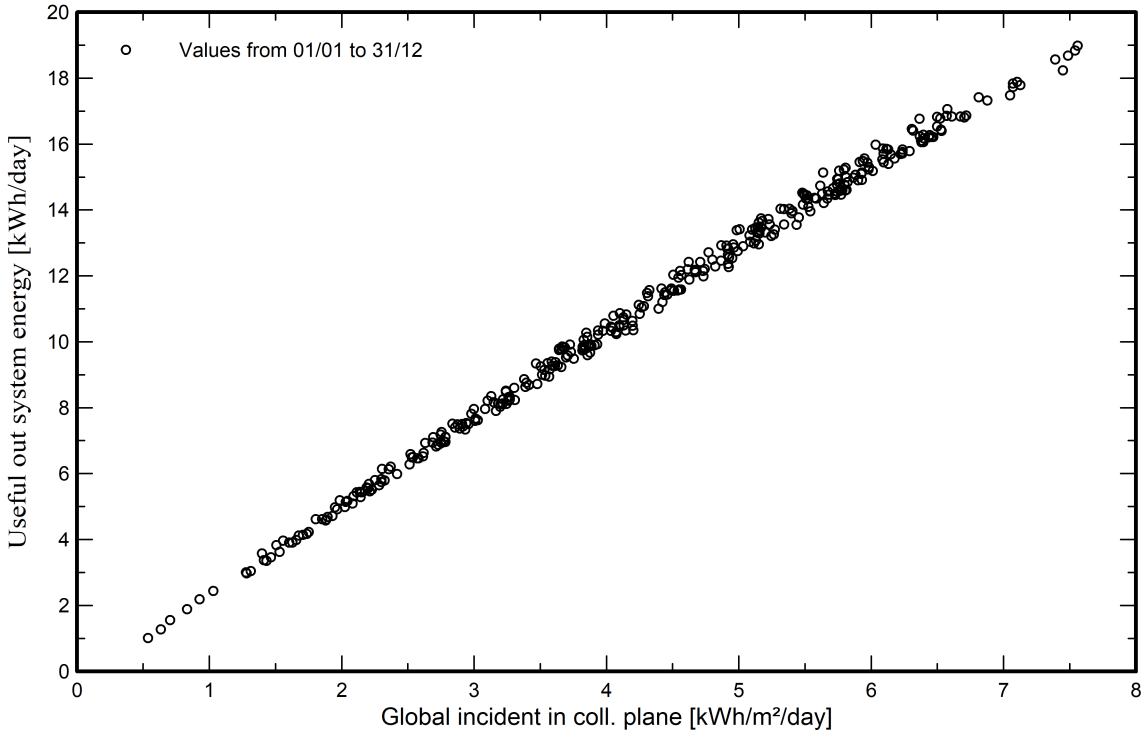
GlobHor	Global horizontal irradiation	EArray	Effective energy at the output of the array
DiffHor	Horizontal diffuse irradiation	E_User	Energy supplied to the user
T_Amb	Ambient Temperature	E_Solar	Energy from the sun
GlobInc	Global incident in coll. plane	E_Grid	Energy injected into grid
GlobEff	Effective Global, corr. for IAM and shadings	EFrGrid	Energy from the grid

Loss diagram

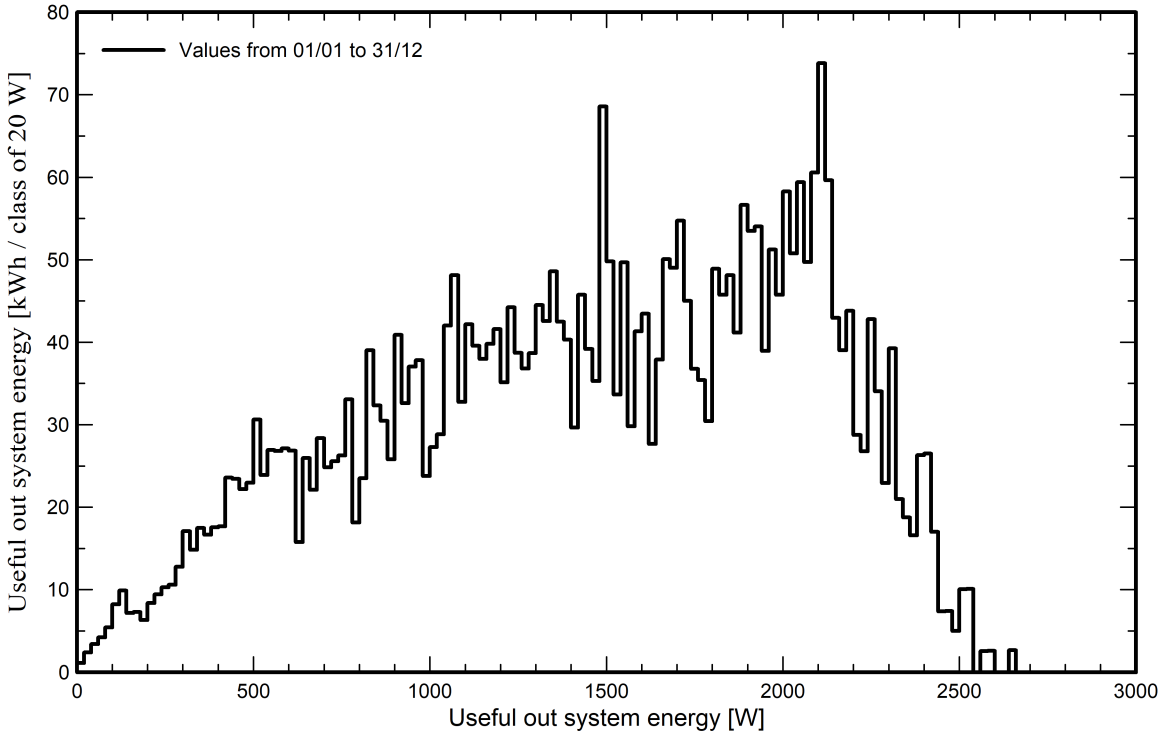


Predef. graphs

Daily Input/Output diagram



System Output Power Distribution



Single-line diagram

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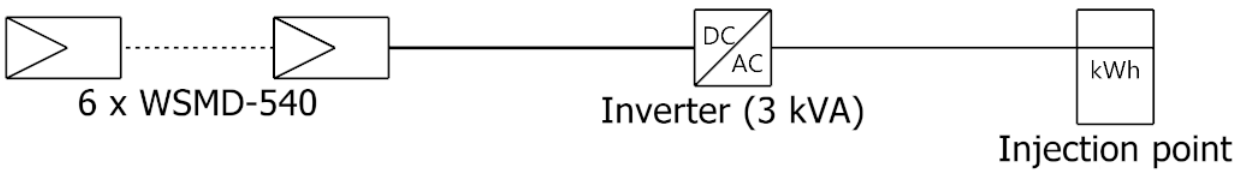

PV module	WSMD-540
Inverter	SG3.0RT-P2
String	6 x WSMD-540

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Cost of the system

Installation costs

Item	Quantity units	Cost INR	Total INR
PV modules			
WSMD-540	6	13,000.00	78,000.00
Supports for modules	6	5,000.00	30,000.00
Installation			
Global installation cost per module	6	5,000.00	30,000.00
		Total	138,000.00
		Depreciable asset	108,000.00

Operating costs

Item	Total INR/year
Subsidies	-78,000.00
Total (OPEX)	-78,000.00

System summary

Total installation cost	138,000.00	INR
Operating costs	-78,000.00	INR/year
Useful energy from solar	2139	kWh/year
Energy sold to the grid	1853	kWh/year
Cost of produced energy (LCOE)	-17.8104	INR/kWh

Financial analysis

Simulation period

Project lifetime	20 years	Start year	2026

Income variation over time

Inflation	0.00 %/year
Module Degradation	0.00 %/year
Discount rate	0.00 %/year

Income dependent expenses

Income tax rate	0.00 %/year
Other income tax	0.00 %/year
Dividends	0.00 %/year

Depreciable assets

Asset	Depreciation method	Depreciation period (years)	Salvage value (INR)	Depreciable (INR)
PV modules				
WSMD-540	Straight-line	20	0.00	78,000.00
Supports for modules	Straight-line	20	0.00	30,000.00
		Total	0.00	108,000.00

Financing

Own funds	138,000.00 INR

Electricity sale

Feed-in tariff	9.00000 INR/kWh
Duration of tariff warranty	20 years
Annual connection tax	0.00 INR/year
Annual tariff variation	0.0 %/year
Feed-in tariff decrease after warranty	0.00 %

Self-consumption

Consumption tariff	0.00000 INR/kWh
Tariff evolution	0.0 %/year

Return on investment

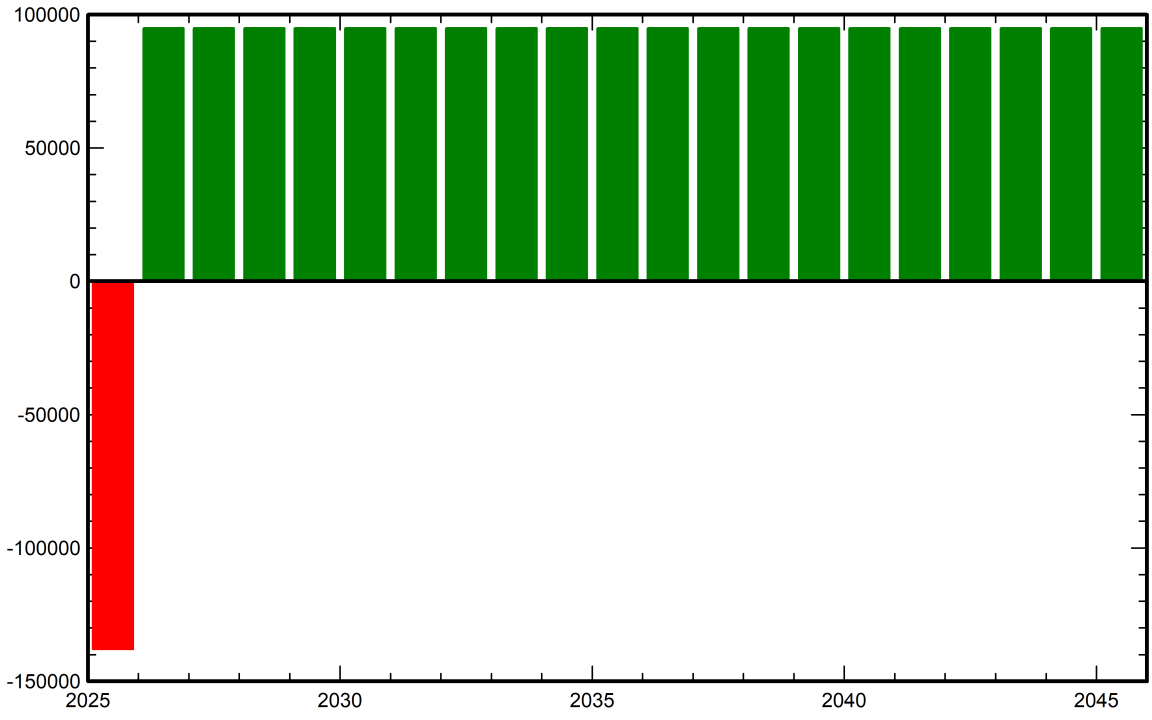
Payback period	1.5 years
Net present value (NPV)	1,760,821.63 INR
Internal rate of return (IRR)	68.80 %
Return on investment (ROI)	1276.0 %

Financial analysis

Detailed economic results (INR)

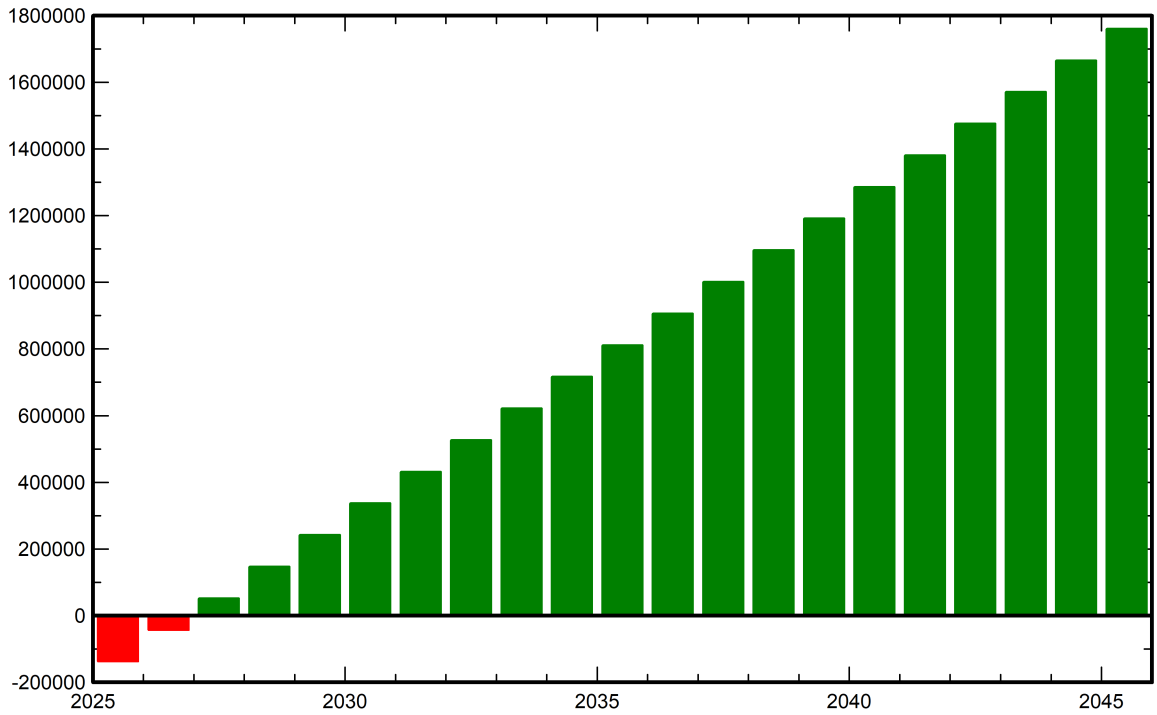
Year	Electricity sale	Own funds	Run. costs	Deprec. allow.	Taxable income	Taxes	After-tax profit	Self-cons. saving	Cumul. profit	% amorti.
0	0	138,000	0	0	0	0	0	0	-138,000	0.0%
1	16,941	0	-78,000	5,400	89,541	0	94,941	0	-43,059	68.8%
2	16,941	0	-78,000	5,400	89,541	0	94,941	0	51,882	137.6%
3	16,941	0	-78,000	5,400	89,541	0	94,941	0	146,823	206.4%
4	16,941	0	-78,000	5,400	89,541	0	94,941	0	241,764	275.2%
5	16,941	0	-78,000	5,400	89,541	0	94,941	0	336,705	344.0%
6	16,941	0	-78,000	5,400	89,541	0	94,941	0	431,646	412.8%
7	16,941	0	-78,000	5,400	89,541	0	94,941	0	526,588	481.6%
8	16,941	0	-78,000	5,400	89,541	0	94,941	0	621,529	550.4%
9	16,941	0	-78,000	5,400	89,541	0	94,941	0	716,470	619.2%
10	16,941	0	-78,000	5,400	89,541	0	94,941	0	811,411	688.0%
11	16,941	0	-78,000	5,400	89,541	0	94,941	0	906,352	756.8%
12	16,941	0	-78,000	5,400	89,541	0	94,941	0	1,001,293	825.6%
13	16,941	0	-78,000	5,400	89,541	0	94,941	0	1,096,234	894.4%
14	16,941	0	-78,000	5,400	89,541	0	94,941	0	1,191,175	963.2%
15	16,941	0	-78,000	5,400	89,541	0	94,941	0	1,286,116	1032.0%
16	16,941	0	-78,000	5,400	89,541	0	94,941	0	1,381,057	1100.8%
17	16,941	0	-78,000	5,400	89,541	0	94,941	0	1,475,998	1169.6%
18	16,941	0	-78,000	5,400	89,541	0	94,941	0	1,570,939	1238.4%
19	16,941	0	-78,000	5,400	89,541	0	94,941	0	1,665,881	1307.2%
20	16,941	0	-78,000	5,400	89,541	0	94,941	0	1,760,822	1376.0%
Total	**338,822**	**138,000**	**-1,560,000**	**108,000**	**1,790,822**	**0**	**1,898,822**	**0**	**1,760,822**	**1376.0%**

Yearly net profit (INR)



Financial analysis

Cumulative cashflow (INR)



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CO_2 Emission Balance

Total: 91.4 tCO_2

Generated emissions

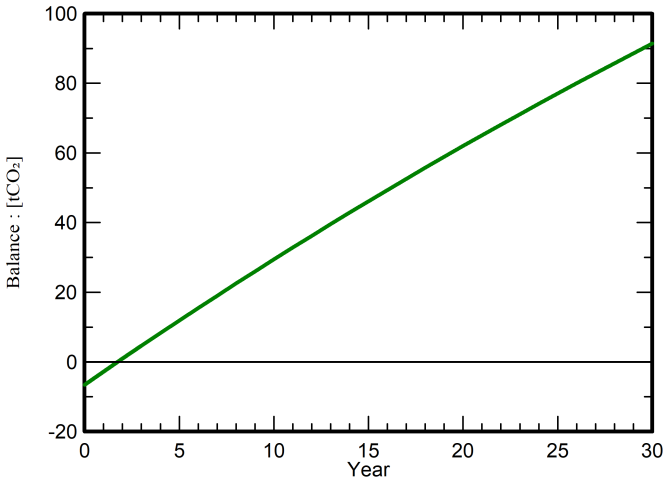
Total: 6.54 tCO_2

Source: Detailed calculation from table below

Replaced Emissions

Total:	112.9 tCO_2
System production:	4021.59 kWh/yr
Grid Lifecycle Emissions:	936 gCO_2/kWh
Source:	IEA List
Country:	India
Lifetime:	30 years
Annual degradation:	1.0 %

Saved CO_2 Emission vs. Time



System Lifecycle Emissions Details

Item	LCE	Quantity	Subtotal
			[$kgCO_2$]
Modules	1713 kgCO2/kWp	3.24 kWp	5549
Supports	6.24 kgCO2/kg	60.0 kg	375
Inverters	619 kgCO2/	1.00	619