

PVsyst - Simulation report

Grid-Connected System

Project: MPSRSolar_ENEL562FinalProject

Variant: New simulation variant

Building system

System power: 5.61 kWp

Beijing/Peking - China

**PVsyst V7.1.0**

Simulation date:
01/12/20 14:16
with v7.1.0

Project summary**Geographical Site**

Beijing/Peking

China

Situation

Latitude 39.93 °N

Longitude 116.28 °E

Altitude 55 m

Time zone UTC+8

Project settings

Albedo 0.20

Meteo data

Beijing/Peking

MeteoNorm 7.2 station - Synthetic

System summary**Grid-Connected System****PV Field Orientation**

Fixed plane

Tilt/Azimuth 40 / 20 °

Building system**Near Shadings**

No Shadings

User's needs

Unlimited load (grid)

System information**PV Array**

Nb. of modules

19 units

Pnom total

5.61 kWp

Inverters

Nb. of units

19 units

Pnom total

5.51 kWac

Pnom ratio

1.017

Results summary

Produced Energy

7.74 MWh/year

Specific production

1382 kWh/kWp/year

Perf. Ratio PR

87.41 %

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General parameters**Grid-Connected System****PV Field Orientation****Orientation**

Fixed plane

Tilt/Azimuth 40 / 20 °

Near Shadings

No Shadings

Building system**Models used**

Transposition

Perez

Diffuse Perez, Meteonorm

Circumsolar separate

User's needs

Unlimited load (grid)

Horizon

Free Horizon

PV Array Characteristics**PV module**

Manufacturer

Generic

Model

CS6K - 295MS-AG 1500V

(Original PVsyst database)

Unit Nom. Power

295 Wp

Number of PV modules

19 units

Nominal (STC)

5.61 kWp

Modules

19 Strings x 1 In series

At operating cond. (50°C)

Pmpp

5.06 kWp

U mpp

29 V

I mpp

175 A

Total PV power

Nominal (STC)

6 kWp

Total

19 modules

Module area

31.2 m²

Cell area

27.9 m²

Inverter

Manufacturer

Generic

Model

IQ7PLUS-72-x-INT

(Original PVsyst database)

Unit Nom. Power

0.290 kWac

Number of inverters

19 units

Total power

5.5 kWac

Operating voltage

16-48 V

Max. power (=>60°C)

0.300 kWac

Pnom ratio (DC:AC)

1.02

Total inverter power

Total power

5.5 kWac

Nb. of inverters

19 units

Pnom ratio

1.02

Array losses**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.

2.8 mΩ

Loss Fraction

1.5 % at STC

Module Quality Loss

Loss Fraction

-0.4 %

Module mismatch losses

Loss Fraction

2.0 % at MPP

Strings Mismatch loss

Loss Fraction

0.1 %

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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Main results

System Production

Produced Energy

7.74 MWh/year

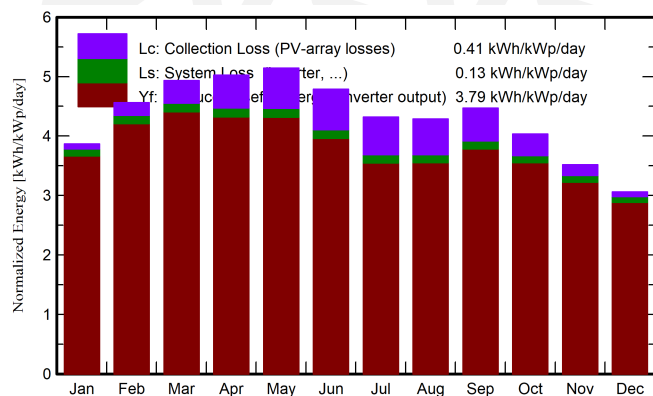
Specific production

1382 kWh/kWp/year

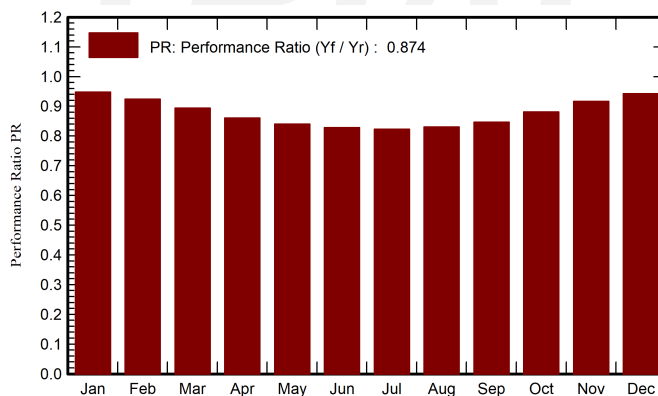
Performance Ratio PR

87.41 %

Normalized productions (per installed kWp)



Performance Ratio PR



Balances and main results

	GlobHor	DiffHor	T_Amb	GlobInc	GlobEff	EArray	E_Grid	PR
	kWh/m ²	kWh/m ²	°C	kWh/m ²	kWh/m ²	MWh	MWh	ratio
January	69.2	31.20	-3.20	119.9	118.3	0.658	0.637	0.948
February	86.4	37.90	0.70	127.7	126.0	0.683	0.661	0.924
March	123.5	59.70	7.50	152.9	150.5	0.792	0.767	0.895
April	144.8	86.30	15.20	150.7	148.0	0.753	0.728	0.861
May	168.2	98.10	21.20	159.4	156.0	0.777	0.750	0.840
June	157.3	99.20	25.10	143.6	140.4	0.691	0.667	0.828
July	144.3	96.00	26.70	133.8	130.9	0.641	0.617	0.823
August	135.7	88.80	25.30	132.8	130.1	0.641	0.618	0.830
September	117.6	65.60	20.20	134.1	131.7	0.659	0.637	0.847
October	94.3	51.70	13.10	125.0	123.1	0.639	0.617	0.881
November	66.4	32.70	4.20	105.6	104.1	0.561	0.543	0.917
December	54.8	27.60	-1.80	94.8	93.5	0.519	0.501	0.943
Year	1362.5	774.80	12.91	1580.5	1552.6	8.013	7.744	0.874

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

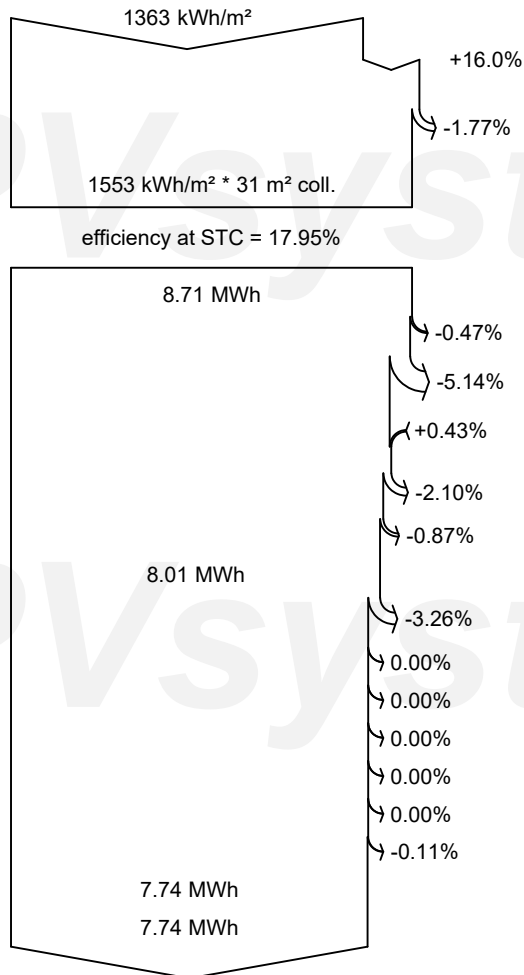
PR Performance Ratio



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Loss diagram



Global horizontal irradiation

Global incident in coll. plane

IAM factor on global

Effective irradiation on collectors

PV conversion

Array nominal energy (at STC effic.)

PV loss due to irradiance level

PV loss due to temperature

Module quality loss

Mismatch loss, modules and strings

Ohmic wiring loss

Array virtual energy at MPP

Inverter Loss during operation (efficiency)

Inverter Loss over nominal inv. power

Inverter Loss due to max. input current

Inverter Loss over nominal inv. voltage

Inverter Loss due to power threshold

Inverter Loss due to voltage threshold

Night consumption

Available Energy at Inverter Output

Energy injected into grid

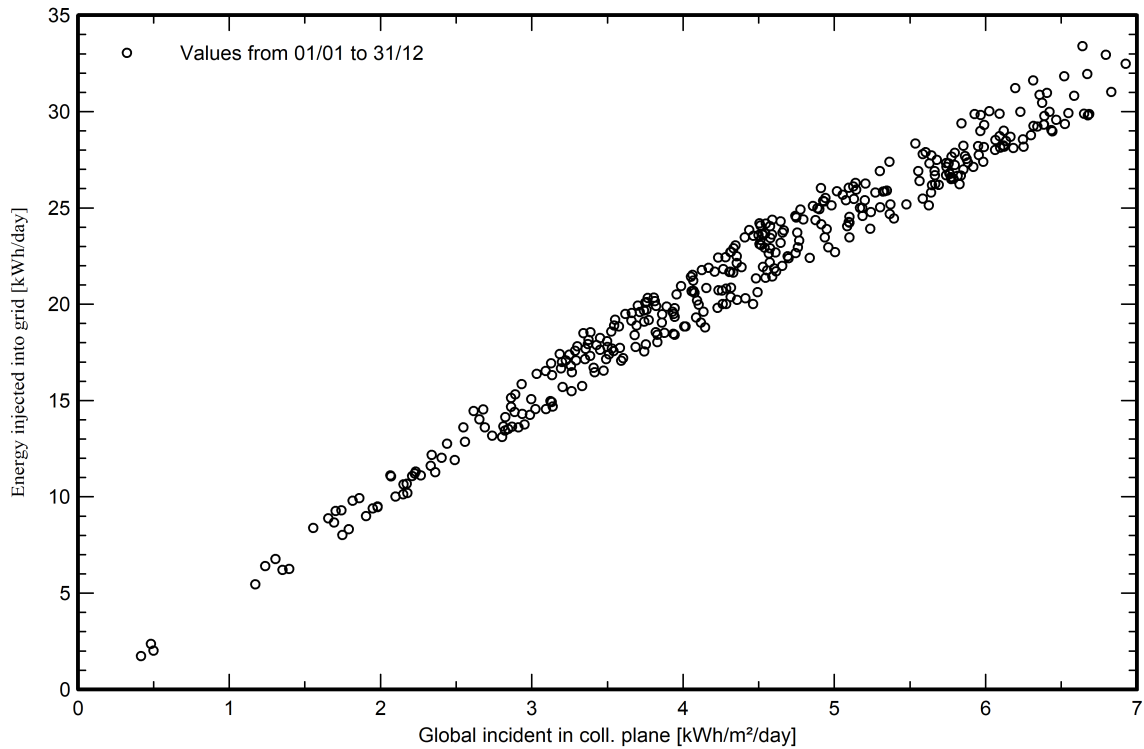


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Special graphs

Daily Input/Output diagram



System Output Power Distribution

