

PVsyst - Simulation report

Grid-Connected System

Project: CEPV_Ungheni_30kW

System power: 30.6 kWp

Ungheni - Republic Of Moldova





Project: CEPV_Ungheni_30kW

PVsyst V7.2.5

VC0, Simulation date:
11/07/23 14:34
with v7.2.5

Project summary

Geographical Site

Ungheni
Republic Of Moldova

Situation

Latitude 47.20 °N
Longitude 27.80 °E
Altitude 66 m
Time zone UTC+2

Project settings

Albedo 0.20

Meteo data

Ungheni
Meteonorm 8.0 (1991-2014), Sat=17% - Synthetic

System summary

Grid-Connected System

PV Field Orientation

Fixed planes 2 orientations
Tilts/azimuths 30 / 44 °
30 / -45 °

Tables on a building

Near Shadings

Linear shadings

User's needs

Unlimited load (grid)

System information

PV Array

Nb. of modules 51 units
Pnom total 30.6 kWp

Inverters

Nb. of units 1 Unit
Pnom total 30.0 kWac
Pnom ratio 1.020

Results summary

Produced Energy 37.60 MWh/year Specific production 1229 kWh/kWp/year Perf. Ratio PR 81.75 %

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

Fixed planes 2 orientations
Tilts/azimuths 30 / 44 °
30 / -45 °

Horizon

Free Horizon

Tables on a building**Sheds configuration**

Nb. of sheds 4 units

Sizes

Sheds spacing 1.36 m
Collector width 5.89 m
Ground Cov. Ratio (GCR) 433.1 %

Shading limit angle

Limit profile angle 141.8 °

Near Shadings

Linear shadings

Models used

Transposition Perez
Diffuse Perez, Meteonorm
Circumsolar separate

User's needs

Unlimited load (grid)

PV Array Characteristics**PV module**

Manufacturer Generic
Model Yangtze Solar
(Custom parameters definition)

Unit Nom. Power 600 Wp
Number of PV modules 51 units
Nominal (STC) 30.6 kWp
Modules 3 Strings x 17 In series

At operating cond. (50°C)

Pmpp 27.52 kWp
U mpp 521 V
I mpp 53 A

Total PV power

Nominal (STC) 31 kWp
Total 51 modules
Module area 146 m²
Cell area 84.5 m²

Inverter

Manufacturer Generic
Model Invt Solar Technology XG30KTR
(Custom parameters definition)

Unit Nom. Power 30.0 kWac
Number of inverters 3 * MPPT 33% 1 unit
Total power 30.0 kWac
Operating voltage 200-1100 V
Pnom ratio (DC:AC) 1.02

Total inverter power

Total power 30 kWac
Nb. of inverters 1 Unit
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

Module mismatch losses

Loss Fraction 2.0 % at MPP

IAM loss factor

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

DC wiring losses

Global array res. 166 mΩ
Loss Fraction 1.5 % at STC

Strings Mismatch loss

Loss Fraction 0.1 %

Module Quality Loss

Loss Fraction -0.8 %

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

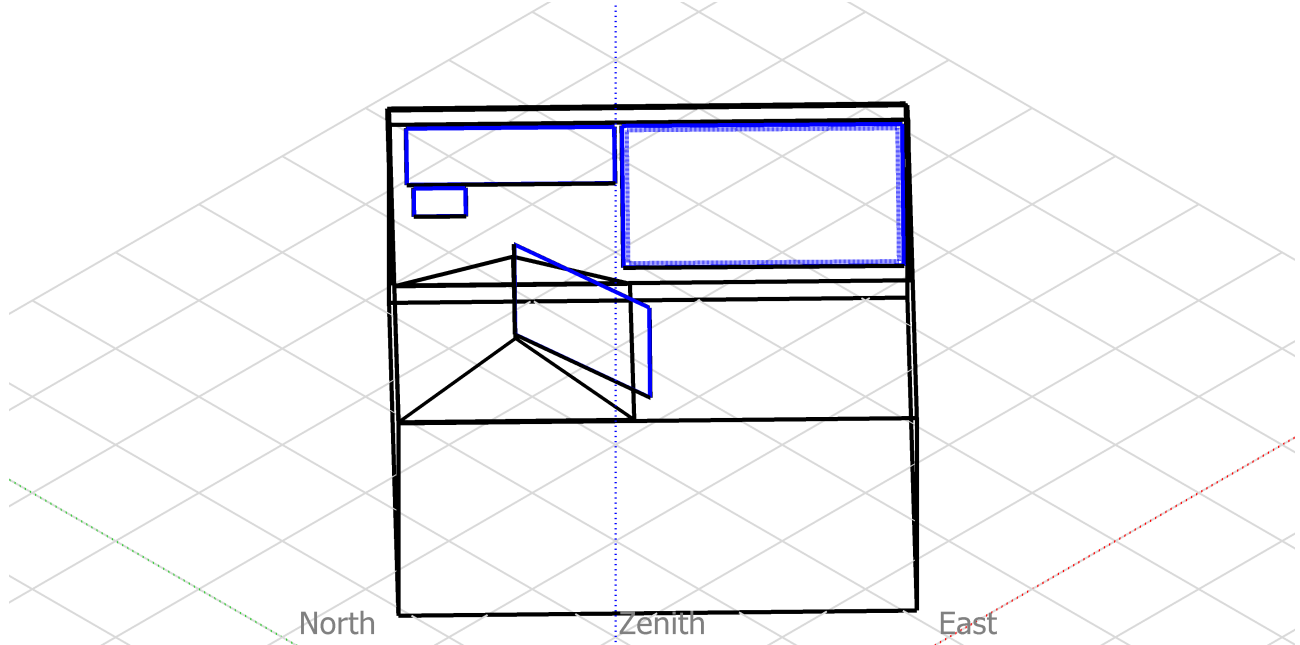


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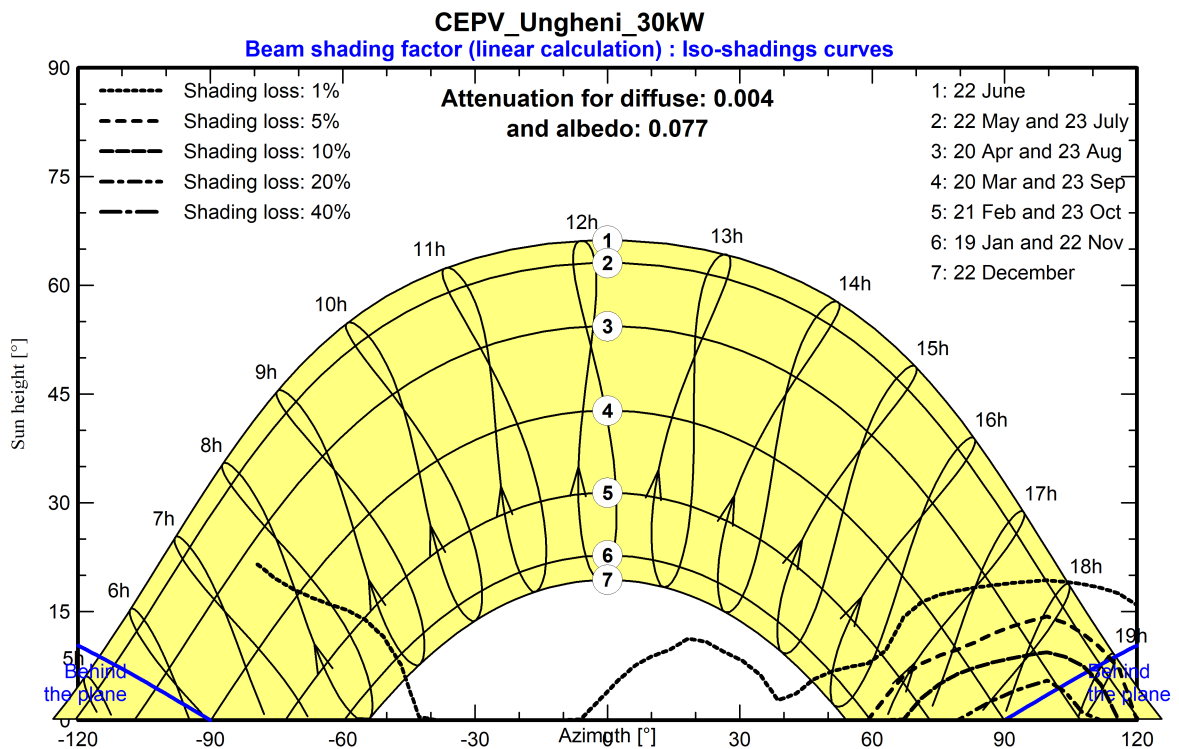
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Near shadings parameter

Perspective of the PV-field and surrounding shading scene



Iso-shadings diagram





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Main results

System Production

Produced Energy

37.60 MWh/year

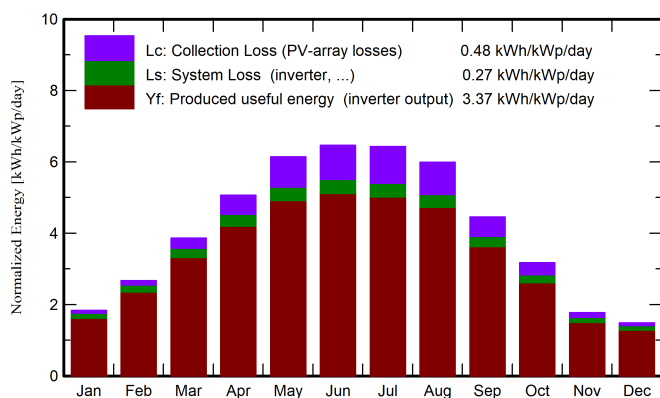
Specific production

1229 kWh/kWp/year

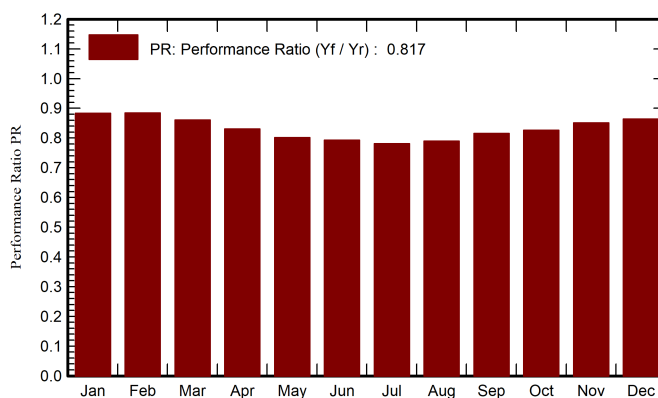
Performance Ratio PR

81.75 %

Normalized productions (per installed kWp)



Performance Ratio PR



Balances and main results

	GlobHor	DiffHor	T_Amb	GlobInc	GlobEff	EArray	E_Grid	PR
	kWh/m²	kWh/m²	°C	kWh/m²	kWh/m²	MWh	MWh	ratio
January	37.5	19.67	-2.04	56.7	54.5	1.673	1.533	0.883
February	56.2	27.91	-0.50	74.6	72.3	2.187	2.019	0.884
March	101.5	50.03	4.99	119.7	115.9	3.403	3.153	0.861
April	139.6	64.37	11.16	152.0	147.2	4.161	3.861	0.830
May	187.4	75.40	17.17	190.4	184.1	5.027	4.667	0.801
June	195.7	81.54	20.39	193.8	187.8	5.064	4.702	0.793
July	198.3	77.40	22.66	199.2	192.7	5.128	4.761	0.781
August	174.2	75.16	22.33	185.7	180.0	4.826	4.488	0.790
September	116.5	54.40	16.30	133.5	129.2	3.595	3.333	0.816
October	77.5	32.61	10.49	98.3	95.3	2.693	2.484	0.826
November	38.5	22.55	5.50	53.1	50.9	1.515	1.382	0.851
December	30.2	17.44	-0.04	46.2	44.2	1.343	1.220	0.864
Year	1353.2	598.49	10.76	1503.2	1454.3	40.615	37.602	0.817

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

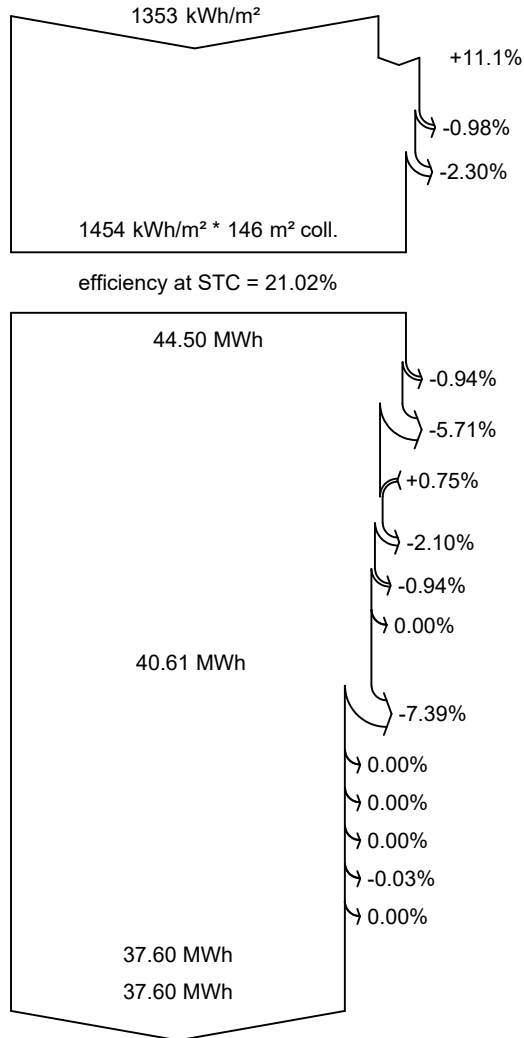
PR Performance Ratio



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Loss diagram



Global horizontal irradiation

Global incident in coll. plane

Near Shadings: irradiance loss

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

Mixed orientation mismatch 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

Available Energy at Inverter Output

Energy injected into grid



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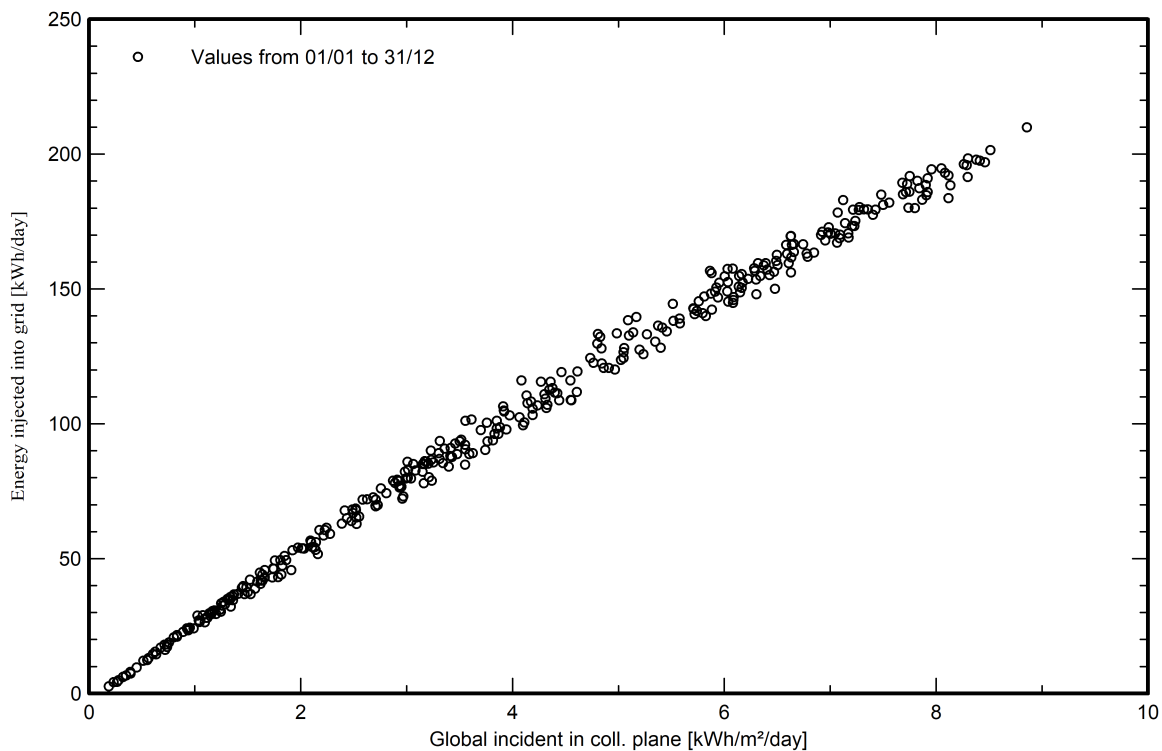
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Special graphs

Daily Input/Output diagram



System Output Power Distribution

