

PVsyst - Simulation report

Grid-Connected System

Project: CEPV_Donduseni_90kW rev2.

System power: 91.2 kWp
Donduseni - Republic Of Moldova





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Project summary

Geographical Site Donduşeni Republic Of Moldova	Situation Latitude 48.25 °N Longitude 27.60 °E Altitude 252 m Time zone UTC+2	Project settings Albedo 0.20
Meteo data Donduşeni Meteonorm 8.0 (1991-2014), Sat=100% - Synthetic		

System summary

Grid-Connected System	Tables on a building	User's needs Unlimited load (grid)
PV Field Orientation Fixed planes 2 orientations Tilts/azimuths 35 / -59 ° 35 / 30 °	Near Shadings Linear shadings	
System information	Inverters	
PV Array Nb. of modules 152 units Pnom total 91.2 kWp	Nb. of units 1 Unit Pnom total 100 kWac Pnom ratio 0.912	

Results summary

Produced Energy 111.1 MWh/year	Specific production 1218 kWh/kWp/year	Perf. Ratio PR 86.86 %
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Table of contents

Project and results summary	2
General parameters, PV Array Characteristics, System losses	3
Near shading definition - Iso-shadings diagram	4
Main results	5
Loss diagram	6
Special graphs	7



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General parameters

Grid-Connected System		Tables on a building			
PV Field Orientation		Sheds configuration		Models used	
Orientation		Nb. of sheds	3 units	Transposition	Perez
Fixed planes	2 orientations	Sizes		Diffuse	Perez, Meteonorm
Tilts/azimuths	35 / -59 °	Sheds spacing	0.00 m	Circumsolar	separate
	35 / 30 °	Collector width	6.04 m		
		Shading limit angle			
		Limit profile angle	145.0 °		
Horizon		Near Shadings		User's needs	
Free Horizon		Linear shadings		Unlimited load (grid)	

PV Array Characteristics

PV module		Inverter	
Manufacturer	Generic	Manufacturer	Invt
Model	Yangtze Solar	Model	INVT_100kW
(Custom parameters definition)		(Custom parameters definition)	
Unit Nom. Power	600 Wp	Unit Nom. Power	100 kWac
Number of PV modules	152 units	Number of inverters	1 unit
Nominal (STC)	91.2 kWp	Total power	100 kWac
Modules	8 Strings x 19 In series	Operating voltage	180-1000 V
At operating cond. (50°C)		Pnom ratio (DC:AC)	0.91
Pmpp	82.0 kWp		
U mpp	583 V		
I mpp	141 A		
Total PV power		Total inverter power	
Nominal (STC)	91 kWp	Total power	100 kWac
Total	152 modules	Nb. of inverters	1 Unit
Module area	434 m²	Pnom ratio	0.91
Cell area	252 m²		

Array losses

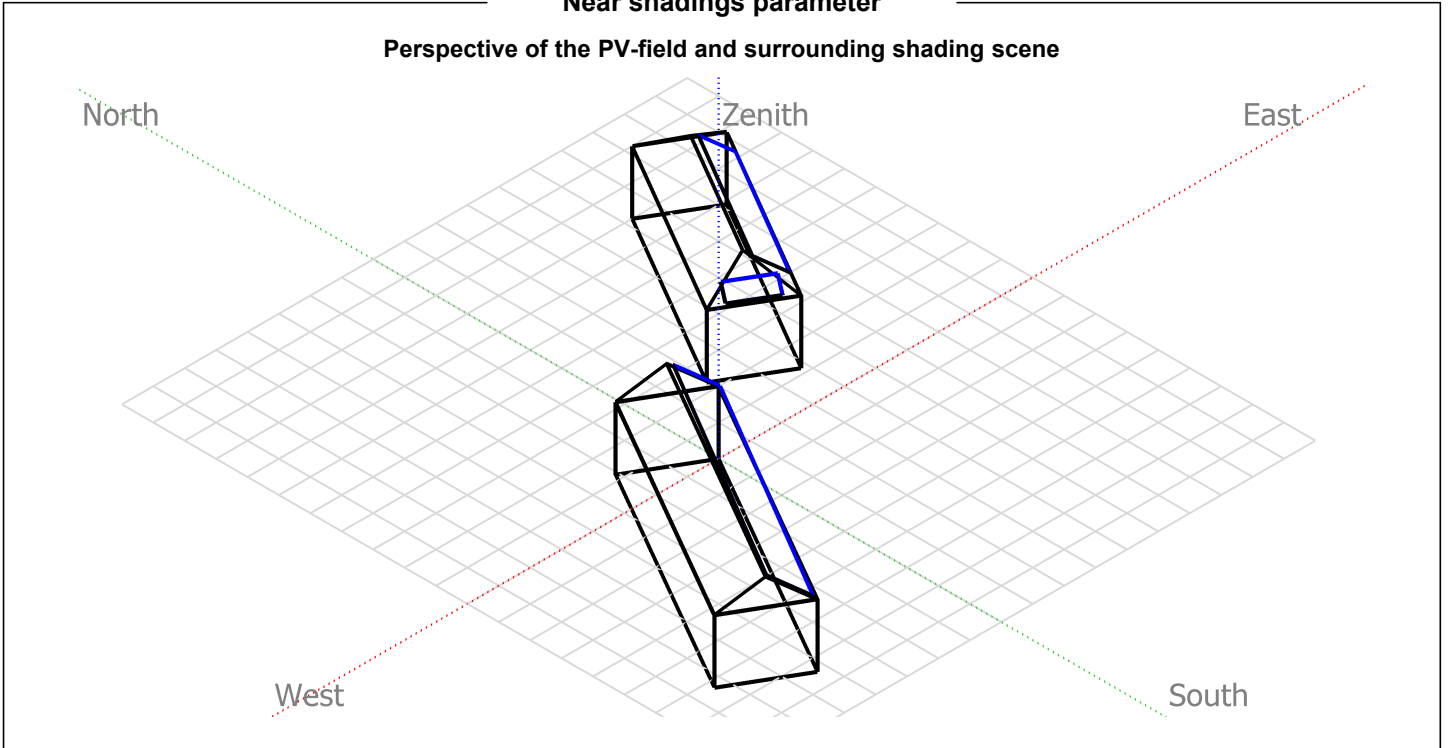
Thermal Loss factor		DC wiring losses		Module Quality Loss				
Module temperature according to irradiance		Global array res.	69 mΩ	Loss Fraction	-0.8 %			
Uc (const)	20.0 W/m²K	Loss Fraction	1.5 % at STC					
Uv (wind)	0.0 W/m²K/m/s							
Module mismatch losses		Strings Mismatch loss						
Loss Fraction	2.0 % at MPP	Loss Fraction	0.1 %					
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	0.962	0.892	0.816	0.681	0.440	0.000



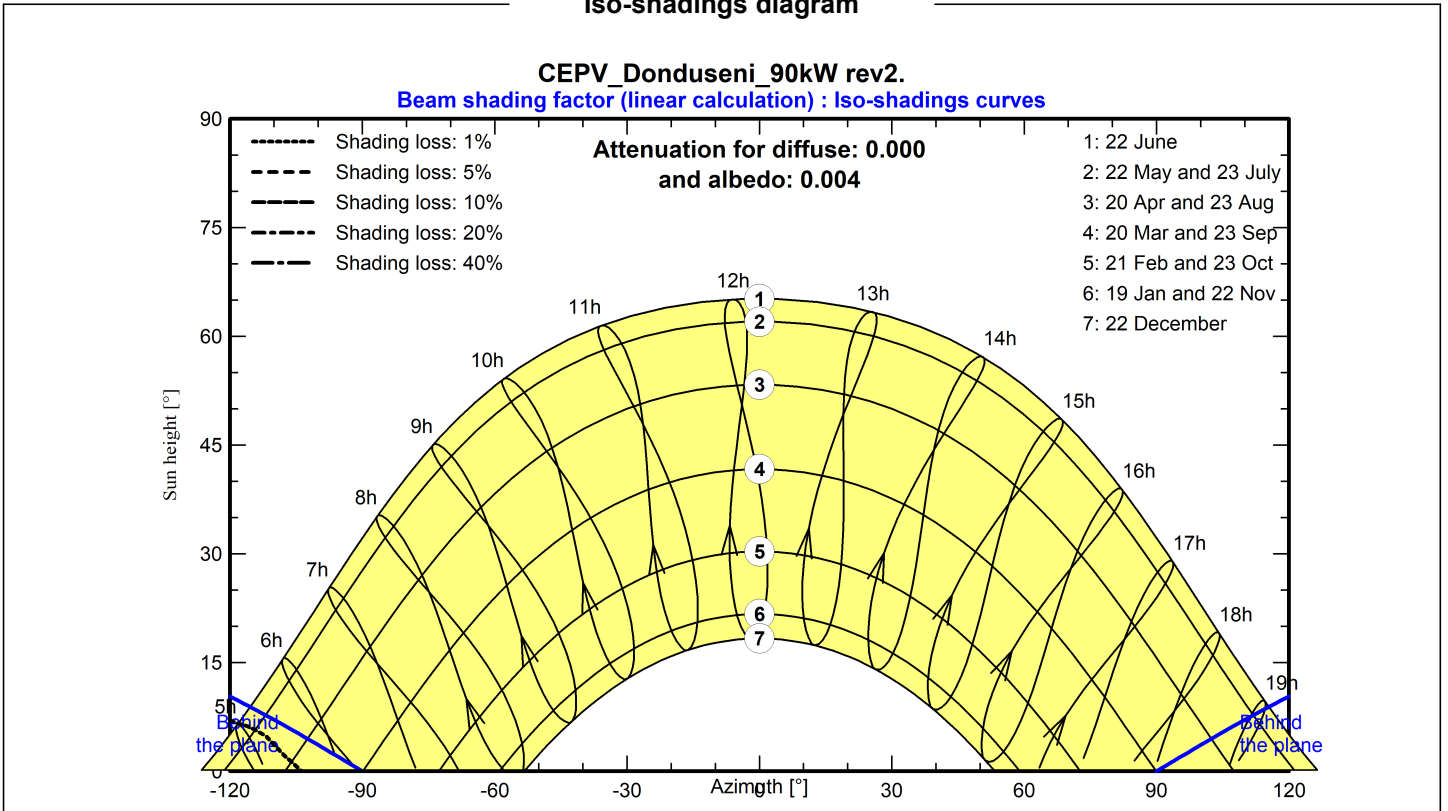
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Near shadings parameter



Iso-shadings diagram





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Main results

System Production

Produced Energy 111.1 MWh/year

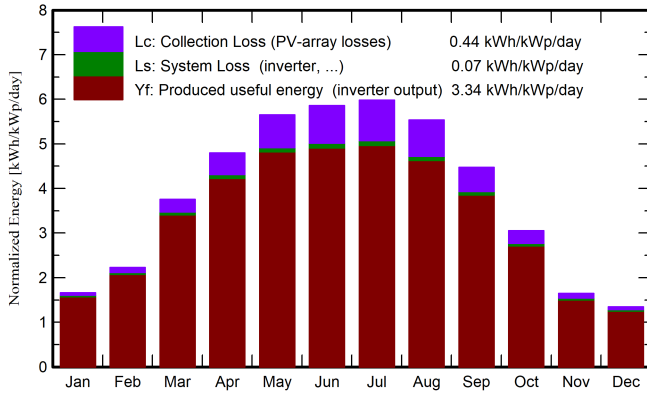
Specific production

1218 kWh/kWp/year

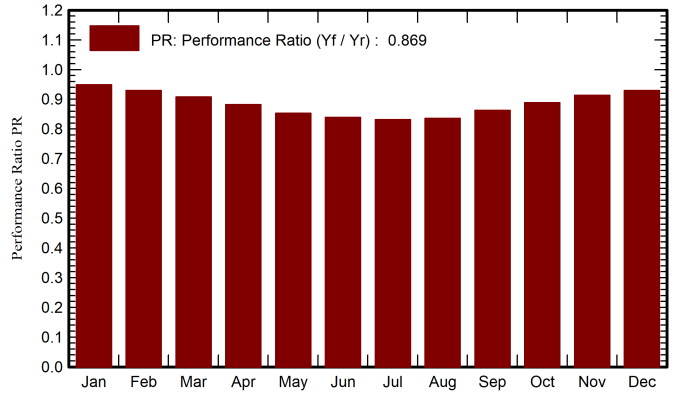
Performance Ratio PR

86.86 %

Normalized productions (per installed kWp)



Performance Ratio PR



Balances and main results

	GlobHor kWh/m ²	DiffHor kWh/m ²	T_Amb °C	GlobInc kWh/m ²	GlobEff kWh/m ²	EArray MWh	E_Grid MWh	PR ratio
January	31.2	18.48	-2.50	51.4	49.8	4.55	4.45	0.949
February	45.7	26.99	-1.33	62.5	60.3	5.41	5.30	0.930
March	92.9	44.24	4.09	116.4	113.4	9.83	9.64	0.908
April	131.0	68.24	10.53	143.8	139.9	11.81	11.58	0.883
May	173.3	79.04	16.40	175.2	170.3	13.91	13.64	0.853
June	183.5	80.65	19.53	175.8	170.3	13.73	13.45	0.839
July	190.4	84.82	21.83	185.4	179.8	14.35	14.06	0.831
August	161.3	74.26	21.09	171.7	167.0	13.36	13.09	0.836
September	110.8	50.03	15.21	134.1	130.5	10.77	10.56	0.863
October	70.6	35.22	9.32	94.7	91.8	7.83	7.67	0.888
November	32.4	20.91	4.84	49.5	47.6	4.22	4.12	0.914
December	25.2	16.62	-0.53	41.8	40.2	3.64	3.55	0.930
Year	1248.3	599.50	9.94	1402.4	1361.0	113.41	111.09	0.869

Legends

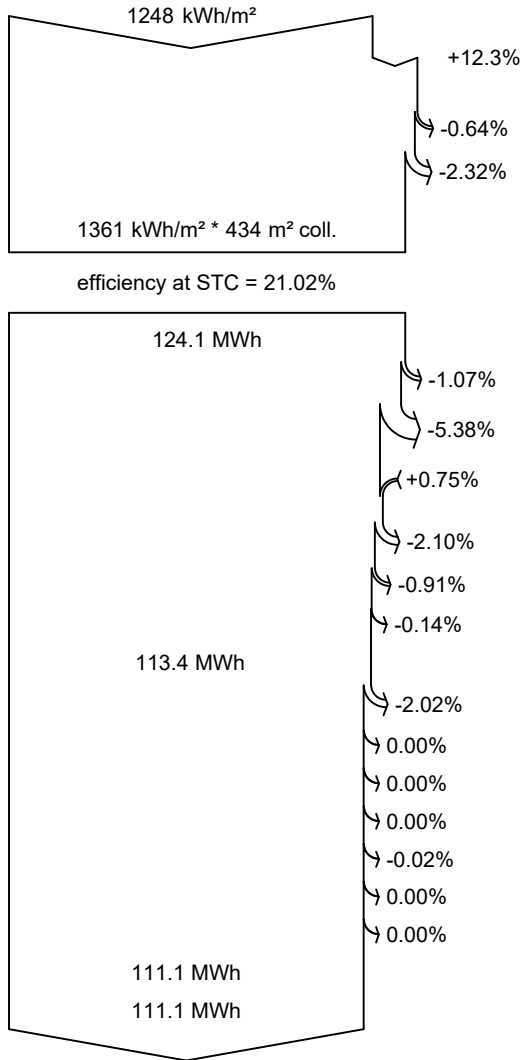
- GlobHor Global horizontal irradiation
- DiffHor Horizontal diffuse irradiation
- T_Amb Ambient Temperature
- GlobInc Global incident in coll. plane
- GlobEff Effective Global, corr. for IAM and shadings
- EArray Effective energy at the output of the array
- E_Grid Energy injected into grid
- PR Performance Ratio



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Loss diagram



- 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
- Night consumption
- Available Energy at Inverter Output**
- Energy injected into grid**

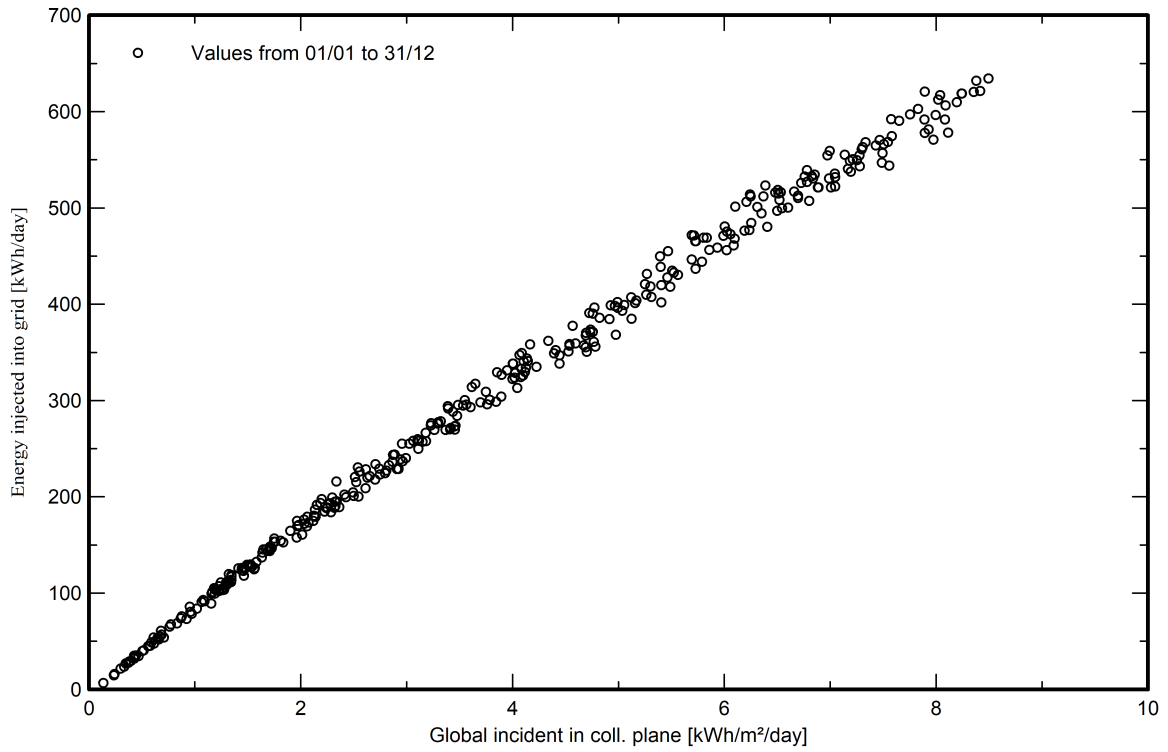


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Special graphs

Daily Input/Output diagram



System Output Power Distribution

