

Grid-Connected System: Simulation parameters

Project : Mykolayiv

Geographical Site Mykolayiv Country **Ukraine**

Situation Latitude 46.96° N Longitude 32.00° E
 Time defined as Legal Time Time zone UT+2 Altitude 13 m
 Albedo 0.20

Meteo data: Mykolayiv Meteonorm 7.2 (1991-2010), Sat=100% - Synthetic

Simulation variant : 10kW

Simulation date 05/04/20 12h48

Simulation parameters System type **No 3D scene defined, no shadings**

Collector Plane Orientation Tilt 25° Azimuth 0°

Models used Transposition Perez Diffuse Perez, Meteonorm

Horizon Free Horizon

Near Shadings No Shadings

User's needs : Unlimited load (grid)

PV Array Characteristics

PV module Si-mono Model **SYP280M**

Original PVsyst database Manufacturer Risen Energy Co., Ltd

Number of PV modules In series 18 modules In parallel 2 strings

Total number of PV modules Nb. modules 36 Unit Nom. Power 280 Wp

Array global power Nominal (STC) **10.08 kWp** At operating cond. 9.02 kWp (50°C)

Array operating characteristics (50°C) U mpp 578 V I mpp 16 A

Total area Module area **69.9 m²** Cell area 61.5 m²

Inverter Model **GW10KN-DT**

Custom parameters definition Manufacturer Goodwe

Characteristics Operating Voltage 200-850 V Unit Nom. Power 10.00 kWac

Inverter pack Nb. of inverters 1 units Total Power 10.0 kWac
 Pnom ratio 1.01

PV Array loss factors

Thermal Loss factor U_c (const) 20.0 W/m²K U_v (wind) 0.0 W/m²K / m/s

Wiring Ohmic Loss Global array res. 621 mOhm Loss Fraction 1.5 % at STC

Module Quality Loss Loss Fraction -0.8 %

Module Mismatch Losses Loss Fraction 1.0 % at MPP

Strings Mismatch loss Loss Fraction 0.10 %

Incidence effect, ASHRAE parametrization IAM = 1 - bo (1/cos i - 1) bo Param. 0.05

Grid-Connected System: Main results

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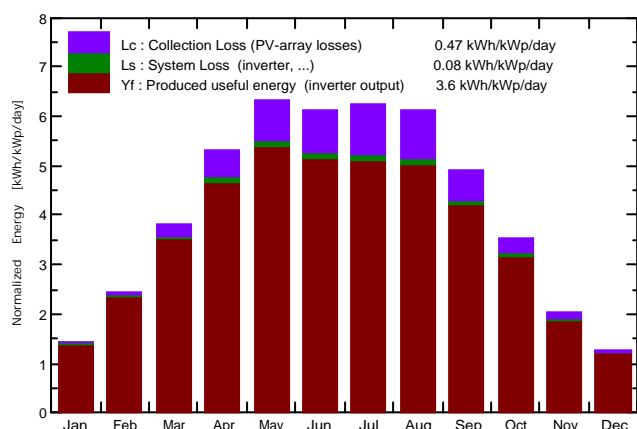
Simulation variant : 10kW

Main system parameters		System type	No 3D scene defined, no shadings	
PV Field Orientation		tilt	25°	azimuth 0°
PV modules		Model	SYP280M	Pnom 280 Wp
PV Array		Nb. of modules	36	Pnom total 10.08 kWp
Inverter		Model	GW10KN-DT	Pnom 10.00 kW ac
User's needs		Unlimited load (grid)		

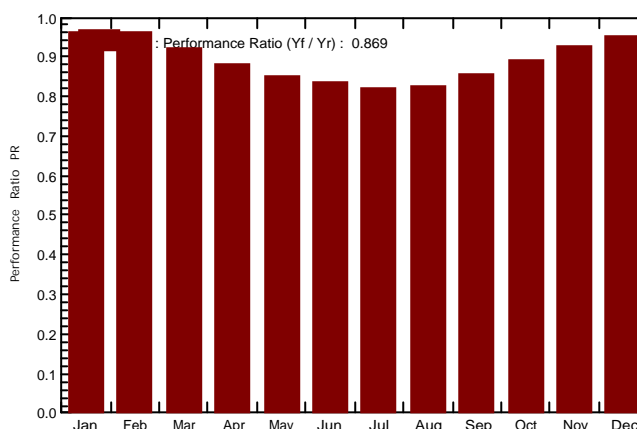
Main simulation results

System Production **Produced Energy 13.23 MWh/year** Specific prod. 1313 kWh/kWp/year
 Performance Ratio PR 86.89 %

Normalized productions (per installed kWp): Nominal power 10.08 kWp



Performance Ratio PR



10KW

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
January	31.4	22.27	-1.32	44.5	42.9	0.443	0.432	0.964
February	49.3	28.27	-0.76	68.2	65.9	0.676	0.662	0.963
March	95.3	48.62	4.33	118.5	114.8	1.124	1.101	0.921
April	139.6	59.09	10.41	159.0	154.2	1.442	1.412	0.881
May	188.8	79.72	16.75	196.5	190.4	1.721	1.686	0.851
June	184.8	85.23	20.42	184.1	178.1	1.589	1.555	0.838
July	190.2	81.57	23.94	193.2	187.2	1.633	1.597	0.820
August	172.4	72.45	23.27	189.4	183.9	1.611	1.578	0.826
September	122.2	54.00	17.01	147.3	142.6	1.299	1.273	0.857
October	77.8	32.95	11.17	110.0	106.6	1.011	0.991	0.894
November	38.3	19.35	5.22	60.8	58.6	0.581	0.569	0.928
December	26.2	18.07	0.35	39.5	38.0	0.389	0.380	0.954
Year	1316.2	601.58	10.97	1511.2	1463.2	13.521	13.235	0.869

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

Grid-Connected System: Special graphs

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PV Field Orientation

PV modules

PV Array

Inverter

User's needs

System type

tilt

Model

Nb. of modules

Model

Unlimited load (grid)

No 3D scene defined, no shadings

25°

azimuth

0°

Pnom

280 Wp

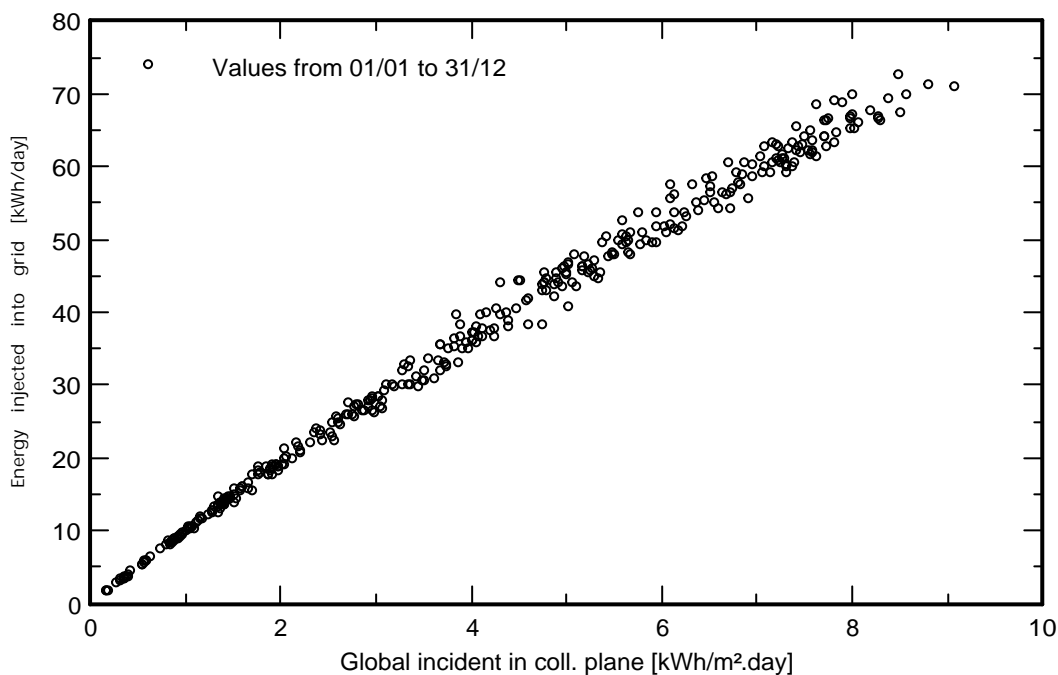
Pnom total

10.08 kWp

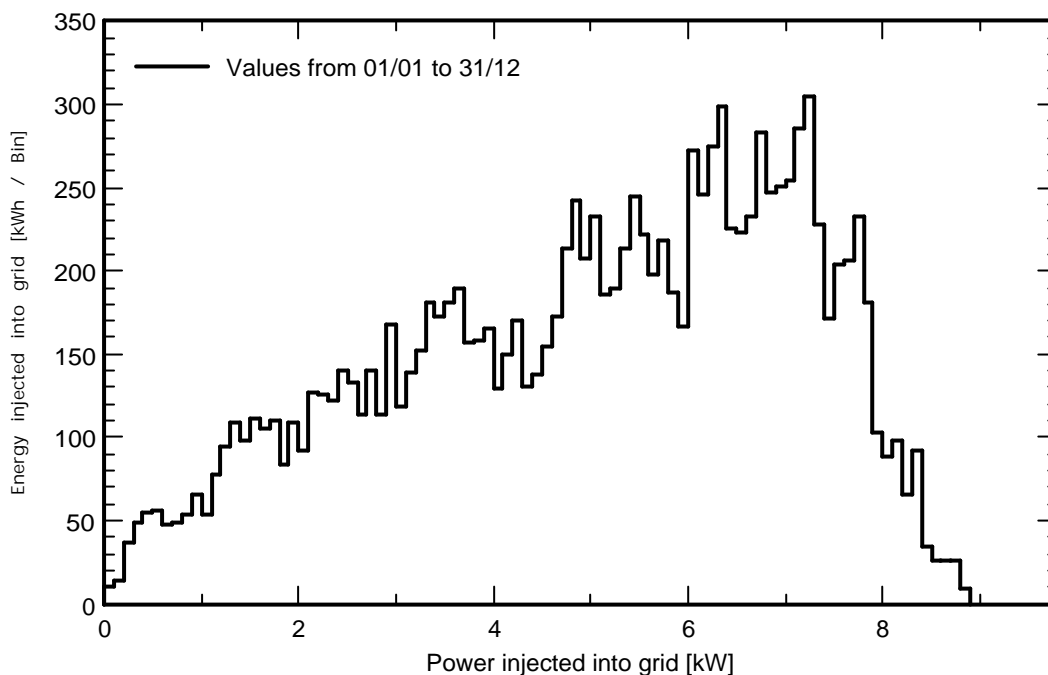
Pnom

10.00 kW ac

Daily Input/Output diagram



System Output Power Distribution



Grid-Connected System: Loss diagram

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PV Field Orientation

PV modules

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User's needs

System type

tilt

Model

Nb. of modules

Model

Unlimited load (grid)

No 3D scene defined, no shadings

tilt

Model

36

Model

Unlimited load (grid)

azimuth

Pnom

Pnom total

Pnom

Pnom

0°

280 Wp

10.08 kWp

10.00 kW ac

Loss diagram over the whole year

