

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 : **30kW**

Simulation date 05/04/20 12h58

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 **RSM120-6-320M**

Custom parameters definition Manufacturer Risen Energy Co., Ltd

Number of PV modules In series 19 modules In parallel 5 strings

Total number of PV modules Nb. modules 95 Unit Nom. Power 320 Wp

Array global power Nominal (STC) **30.4 kWp** At operating cond. 27.44 kWp (50°C)

Array operating characteristics (50°C) U mpp 571 V I mpp 48 A

Total area Module area **159 m²** Cell area 139 m²

Inverter Model **GW30K-MT**

Custom parameters definition Manufacturer Goodwe

Characteristics Operating Voltage 200-950 V Unit Nom. Power 30.0 kWac

Inverter pack Nb. of inverters 1 units Total Power 30 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. 200 mOhm Loss Fraction 1.5 % at STC

LID - Light Induced Degradation Loss Fraction 2.5 %

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 (IAM): User defined profile

0°	20°	30°	40°	50°	60°	70°	80°	90°
1.000	1.000	1.000	1.000	1.000	0.988	0.925	0.733	0.000

Grid-Connected System: Main results

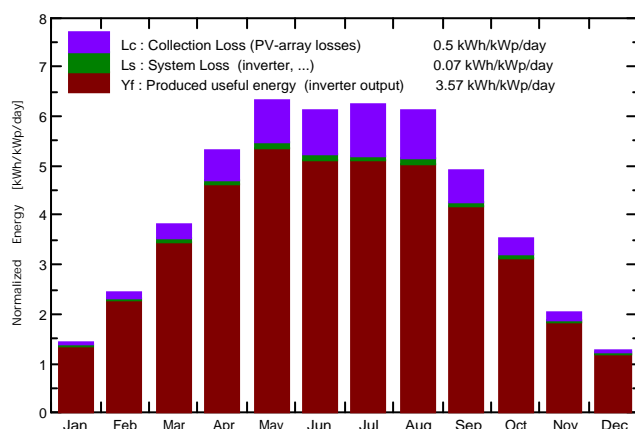
Project : Mykolayiv

Simulation variant : 30kW

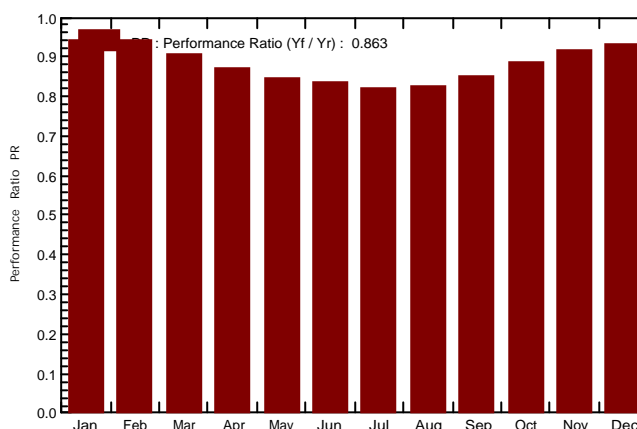
Main system parameters		System type	No 3D scene defined, no shadings	
PV Field Orientation		tilt	25°	azimuth 0°
PV modules		Model	RSM120-6-320M	Pnom 320 Wp
PV Array		Nb. of modules	95	Pnom total 30.4 kWp
Inverter		Model	GW30K-MT	Pnom 30.0 kW ac
User's needs		Unlimited load (grid)		

Main simulation results	
System Production	Produced Energy 39.62 MWh/year Specific prod. 1303 kWh/kWp/year
	Performance Ratio PR 86.25 %

Normalized productions (per installed kWp): Nominal power 30.4 kWp



Performance Ratio PR



30KW

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	43.8	1.300	1.274	0.942
February	49.3	28.27	-0.76	68.2	67.2	1.991	1.955	0.943
March	95.3	48.62	4.33	118.5	116.6	3.327	3.268	0.907
April	139.6	59.09	10.41	159.0	156.4	4.298	4.222	0.873
May	188.8	79.72	16.75	196.5	193.2	5.155	5.064	0.848
June	184.8	85.23	20.42	184.1	180.8	4.764	4.677	0.836
July	190.2	81.57	23.94	193.2	190.0	4.910	4.822	0.821
August	172.4	72.45	23.27	189.4	186.5	4.840	4.754	0.826
September	122.2	54.00	17.01	147.3	144.9	3.884	3.816	0.852
October	77.8	32.95	11.17	110.0	108.6	3.013	2.959	0.885
November	38.3	19.35	5.22	60.8	59.9	1.724	1.690	0.915
December	26.2	18.07	0.35	39.5	38.9	1.145	1.121	0.934
Year	1316.2	601.58	10.97	1511.2	1486.8	40.351	39.623	0.863

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

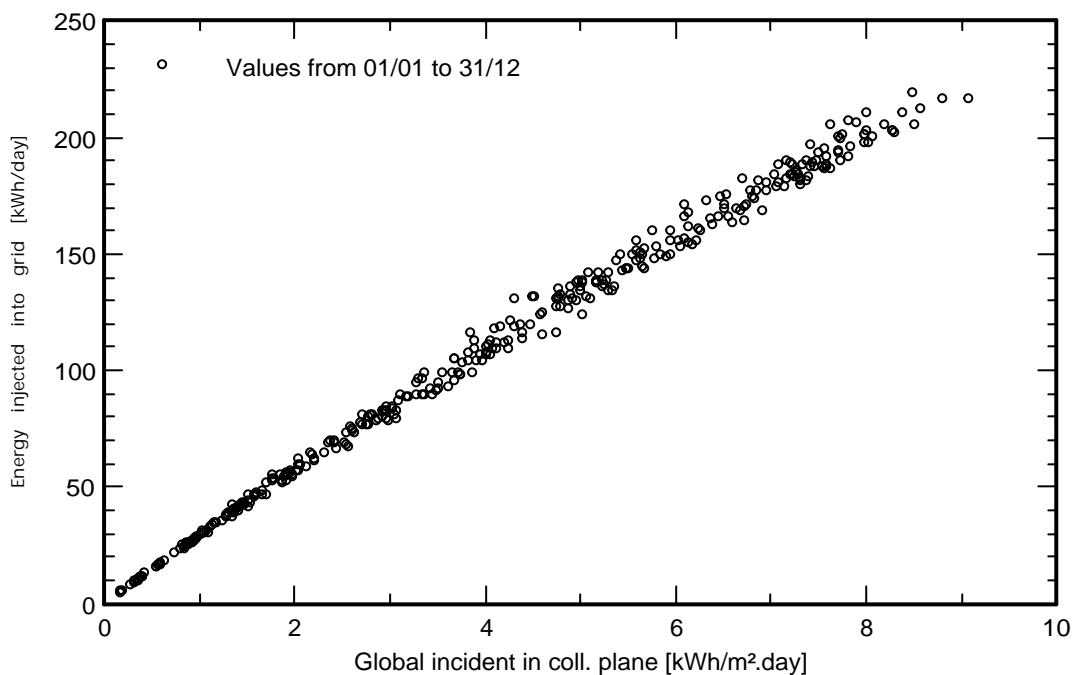
Project : Mykolayiv

Simulation variant : 30kW

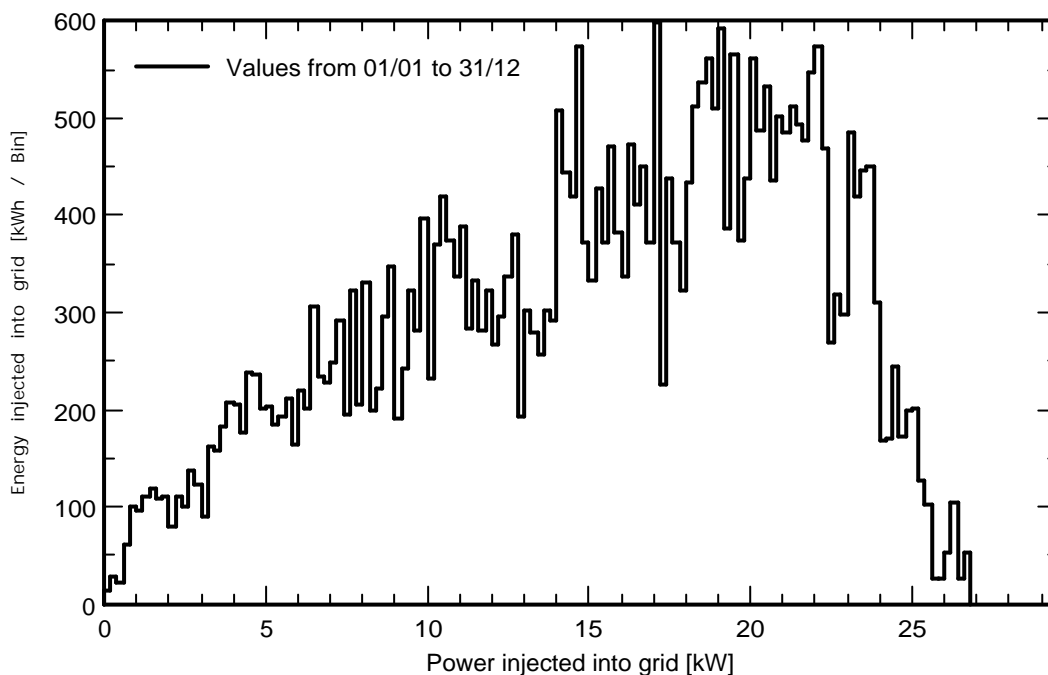
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PV Array	Nb. of modules	95	Pnom total 30.4 kWp
Inverter	Model	GW30K-MT	Pnom 30.0 kW ac
User's needs	Unlimited load (grid)		

Daily Input/Output diagram



System Output Power Distribution



Grid-Connected System: Loss diagram

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Simulation variant : 30kW

Main system parameters

PV Field Orientation

PV modules

PV Array

Inverter

User's needs

System type

tilt 25°

Model RSM120-6-320M

Nb. of modules 95

Model GW30K-MT

Unlimited load (grid)

No 3D scene defined, no shadings

azimuth 0°

Pnom 320 Wp

Pnom total **30.4 kWp**

Pnom 30.0 kW ac

Loss diagram over the whole year

