

# PVsyst - Simulation report

## Grid-Connected System

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Project: Klaipėdos Žemynos gimnazija

Variant: 60 kW

Tables on a building

System power: 60.0 kWp

Klaipėda - Lithuania

**Author**

Eternia Solar LT, UAB (Lithuania)



# Project: Klaipėdos Žėmynos gimnazija

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## PVsyst V7.2.0

VC2, Simulation date:  
29/04/21 16:25  
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### Project summary

<b>Geographical Site</b>		<b>Situation</b>		<b>Project settings</b>	
Klaipėda		Latitude	55.71 °N	Albedo	0.20
Lithuania		Longitude	21.14 °E		
		Altitude	17 m		
		Time zone	UTC+2		
<b>Meteo data</b>					
Senamiestis					
Meteonorm 7.3 (1991-2010), Sat=100% - Synthetic					

### System summary

<b>Grid-Connected System</b>		<b>Tables on a building</b>		<b>User's needs</b>	
<b>PV Field Orientation</b>		<b>Near Shadings</b>		Unlimited load (grid)	
Fixed plane		Linear shadings			
Tilt/Azimuth	10 / 3 °				
<b>System information</b>					
<b>PV Array</b>					
Nb. of modules	160 units	<b>Inverters</b>		2 units	
Pnom total	60.0 kWp	Nb. of units		60.0 kWac	
		Pnom total		1.000	
		Pnom ratio			

### Results summary

Produced Energy	59.55 MWh/year	Specific production	992 kWh/kWp/year	Perf. Ratio PR	90.37 %
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### General parameters

Grid-Connected System		Tables on a building			
<b>PV Field Orientation</b>		<b>Sheds configuration</b>		<b>Models used</b>	
Orientation		Nb. of sheds	160 units	Transposition	Perez
Fixed plane		<b>Sizes</b>		Diffuse	Perez, Meteonorm
Tilt/Azimuth	10 / 3 °	Sheds spacing	0.00 m	Circumsolar	separate
		Collector width	1.04 m		
		<b>Shading limit angle</b>			
		Limit profile angle	170.0 °		
<b>Horizon</b>		<b>Near Shadings</b>		<b>User's needs</b>	
Free Horizon		Linear shadings		Unlimited load (grid)	

### PV Array Characteristics

PV module		Inverter	
Manufacturer	Suntech	Manufacturer	SolarEdge
Model	STP375S-B60/Wnh_1500V_20V02_1756	Model	SE30K-EU-APAC/AUS (400V)
	(Custom parameters definition)		(Original PVsyst database)
Unit Nom. Power	375 Wp	Unit Nom. Power	30.0 kWac
Number of PV modules	160 units	Number of inverters	2 units
Nominal (STC)	60.0 kWp	Total power	60.0 kWac
Optimizer Array	4 Strings x 20 In series	Operating voltage	750 V
<b>At operating cond. (50°C)</b>		Pnom ratio (DC:AC)	0.85
Pmpp	54.7 kWp		
Output of optimizers			
Voper	750 V		
I at Poper	73 A		
<b>SolarEdge Power Optimizer</b>			
Model	P850 Worldwide		
Unit Nom. Power	850 W		
Modules	1 String x 2 in series		
<b>Total PV power</b>		<b>Total inverter power</b>	
Nominal (STC)	60 kWp	Total power	60 kWac
Total	160 modules	Nb. of inverters	2 units
Module area	292 m <sup>2</sup>	Pnom ratio	1.00
Cell area	265 m <sup>2</sup>		

### Array losses

<b>Array Soiling Losses</b>		<b>Thermal Loss factor</b>		<b>DC wiring losses</b>				
Loss Fraction	1.5 %	Module temperature according to irradiance		Global array res.	140 mΩ			
		Uc (const)	29.0 W/m <sup>2</sup> K	Loss Fraction	1.5 % at STC			
		Uv (wind)	0.0 W/m <sup>2</sup> K/m/s					
<b>LID - Light Induced Degradation</b>		<b>Module Quality Loss</b>		<b>Module mismatch losses</b>				
Loss Fraction	1.0 %	Loss Fraction	-0.3 %	Loss Fraction (Fixed voltage)	0.0 %			
<b>IAM loss factor</b>								
Incidence effect (IAM): User defined profile								
0°	30°	50°	60°	70°	75°	80°	85°	90°
1.000	1.000	1.000	0.981	0.946	0.920	0.867	0.707	0.000



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**AC wiring losses**

**Inv. output line up to injection point**

Inverter voltage	400 Vac tri
Loss Fraction	0.6 % at STC

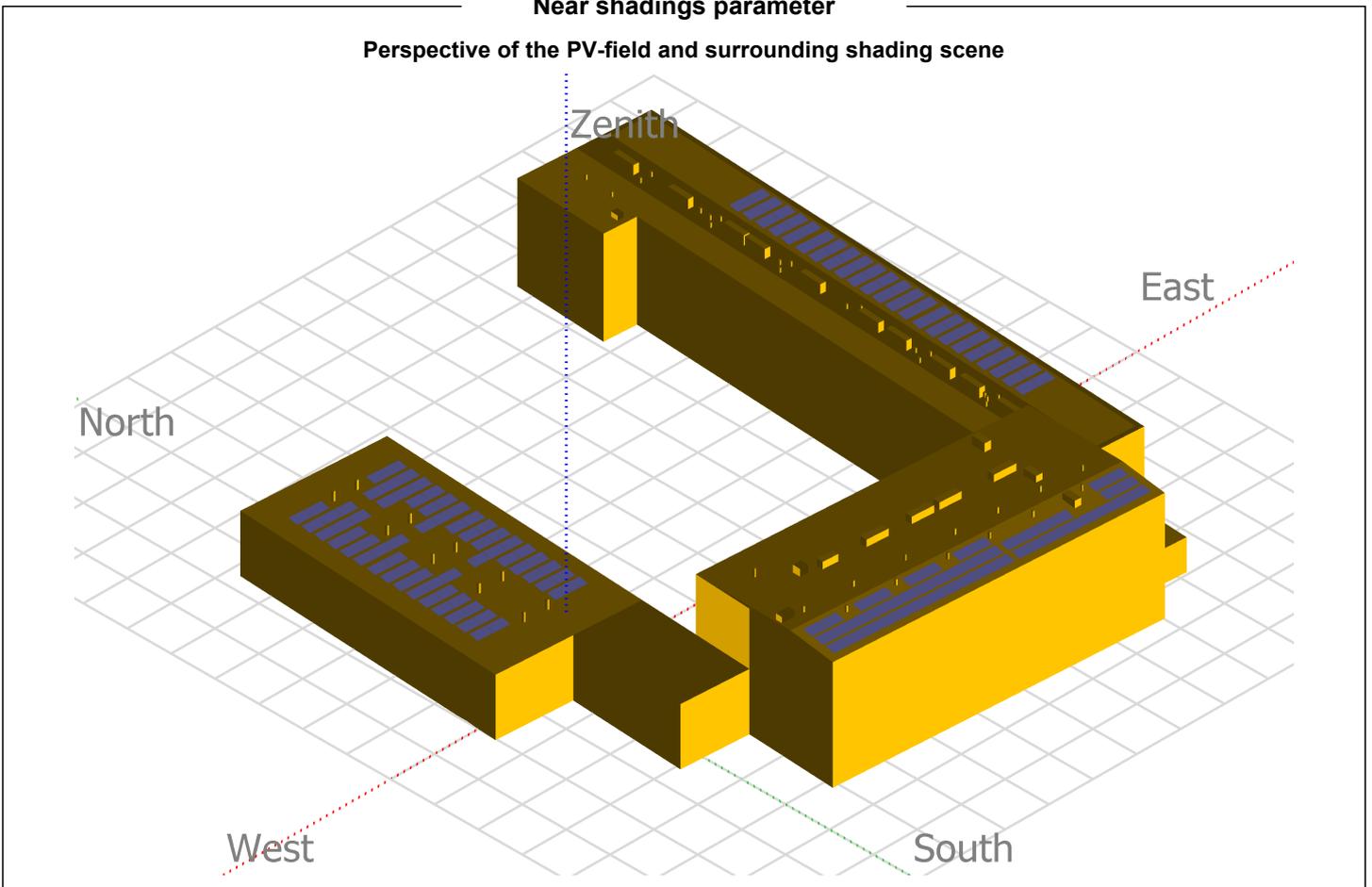
**Inverter: SE30K-EU-APAC/AUS (400V)**

Wire section (2 Inv.)	Copper 2 x 3 x 35 mm <sup>2</sup>
Average wires length	58 m



Near shadings parameter

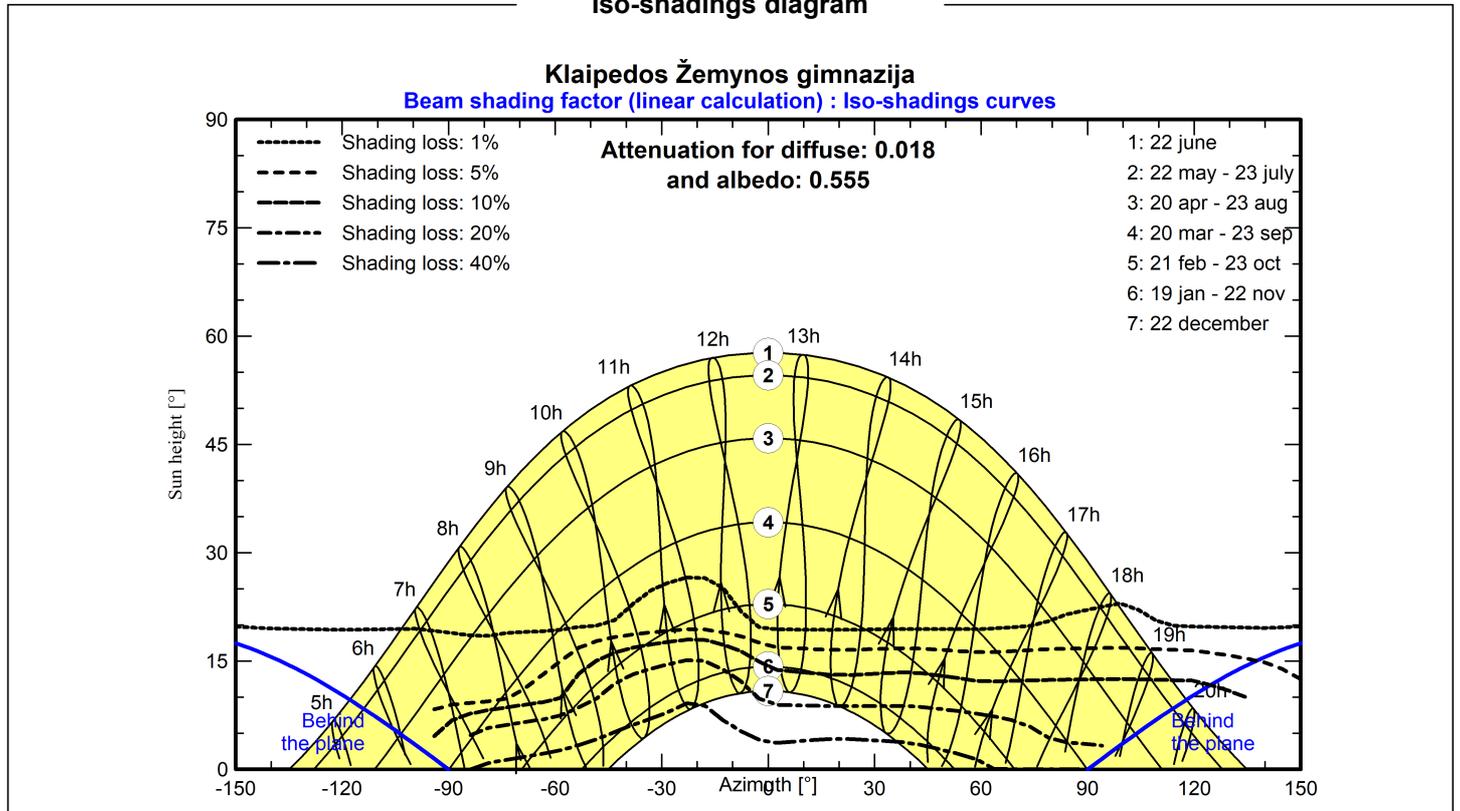
Perspective of the PV-field and surrounding shading scene



Iso-shadings diagram



Iso-shadings diagram





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## Main results

### System Production

Produced Energy 59.55 MWh/year

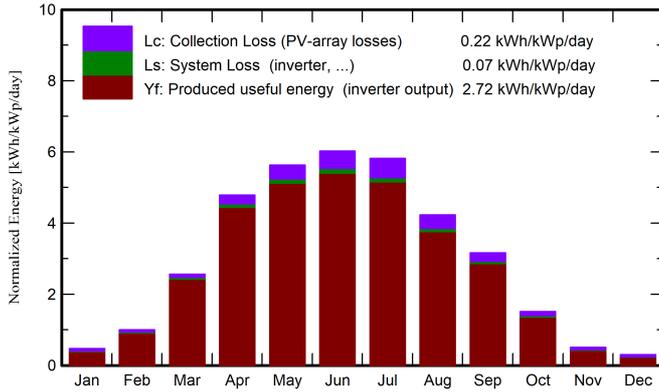
Specific production

992 kWh/kWp/year

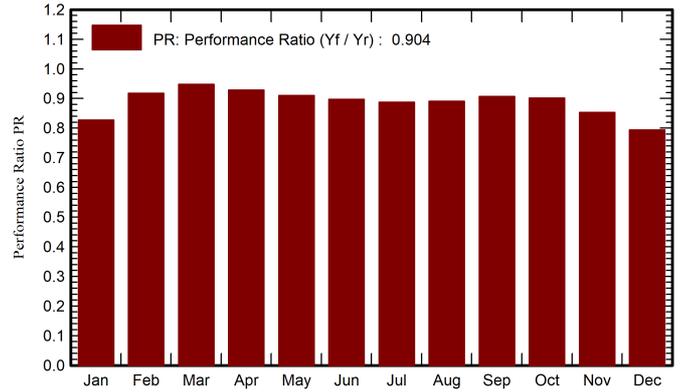
Performance Ratio PR

90.37 %

### Normalized productions (per installed kWp)



### Performance Ratio PR



### Balances and main results

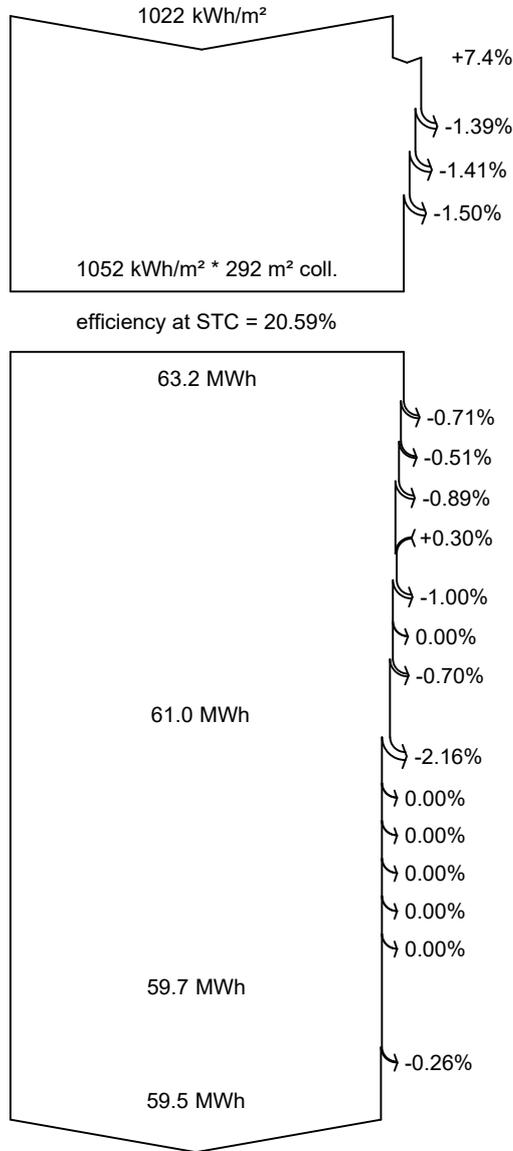
	GlobHor kWh/m <sup>2</sup>	DiffHor kWh/m <sup>2</sup>	T_Amb °C	GlobInc kWh/m <sup>2</sup>	GlobEff kWh/m <sup>2</sup>	EArray MWh	E_Grid MWh	PR ratio
January	11.9	9.30	-2.03	14.7	12.6	0.761	0.730	0.828
February	24.2	17.88	-1.87	28.1	25.9	1.594	1.546	0.918
March	69.6	41.66	1.31	79.3	75.8	4.620	4.509	0.948
April	130.2	53.42	7.13	143.5	138.3	8.183	7.997	0.929
May	167.2	69.24	12.39	174.5	168.3	9.755	9.529	0.910
June	176.1	76.21	15.63	180.8	174.6	9.966	9.735	0.897
July	174.1	80.68	19.27	180.3	174.0	9.822	9.596	0.887
August	123.9	71.47	18.92	131.1	126.1	7.172	7.005	0.891
September	84.9	47.84	13.46	94.8	90.8	5.279	5.155	0.907
October	40.0	24.06	8.30	46.9	44.0	2.606	2.535	0.901
November	12.9	9.95	3.87	15.1	13.5	0.805	0.774	0.853
December	7.4	5.75	0.11	9.2	7.7	0.458	0.438	0.794
Year	1022.3	507.45	8.10	1098.2	1051.7	61.022	59.547	0.904

### Legends

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



Loss diagram



**Global horizontal irradiation**

**Global incident in coll. plane**

Near Shadings: irradiance loss

IAM factor on global

Soiling loss factor

**Effective irradiation on collectors**

PV conversion

**Array nominal energy (at STC effic.)**

PV loss due to irradiance level

PV loss due to temperature

Optimizer efficiency loss

Module quality loss

LID - Light induced degradation

Module array mismatch loss

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

**Available Energy at Inverter Output**

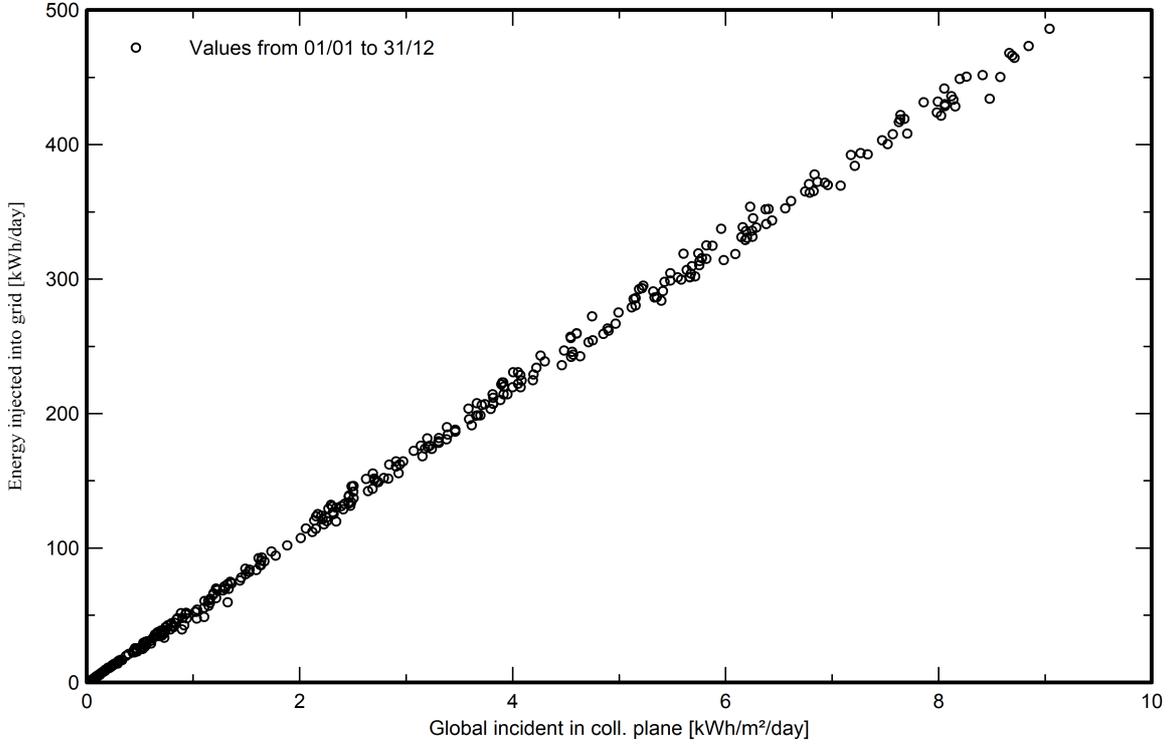
AC ohmic loss

**Energy injected into grid**



Special graphs

Daily Input/Output diagram



System Output Power Distribution

