Version 7.3.1

PVsyst - Simulation report

Grid-Connected System

Project: SFS Project

Variant: Test 03_SFSPanelTest

Building system

System power: 162 kWp

Minneola - United States

Author

PVsyst V7.3.1
VC5, Simulation date:
01/04/24 01:05
with v7.3.1

Project summary

Geographical Site
Minneola
United States

Situation

Latitude	34.69 °N
Longitude	-116.78 °W
Altitude	1378 m
Time zone	UTC-8

Project settings

Albedo	0.20

Meteo data
Minneola
Meteonorm 8.1 (1991-2005), Sat=58% - Synthetic

System summary

Grid-Connected System

Building system

PV Field Orientation

Fixed planes	5 orientations
Tilts/azimuths	13.7 / -176.8 °
	79.7 / -174.1 °
	67.4 / 102 °
	52.3 / 6.6 °
	66 / -90 °

Near Shadings
Linear shadings

User's needs
Unlimited load (grid)

System information

PV Array

Nb. of modules	272 units
Pnom total	162 kWp

Inverters

Nb. of units	6 units
Pnom total	134 kWac
Pnom ratio	1.208

Results summary

Produced Energy	133083 kWh/year	Specific production	822 kWh/kWp/year	Perf. Ratio PR	55.53 %

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General parameters

Grid-Connected System

Building system

PV Field Orientation

Orientation	
Fixed planes	5 orientations
Tilts/azimuths	13.7 / -176.8 °
	79.7 / -174.1 °
	67.4 / 102 °
	52.3 / 6.6 °
	66 / -90 °

Sheds configuration

Models used

Transposition	Perez
Diffuse	Perez, Meteonorm
Circumsolar	separate

Horizon
Free Horizon

Near Shadings
Linear shadings

User's needs
Unlimited load (grid)

PV Array Characteristics

PV module

Manufacturer	SFS
Model	SFS-Assembly
(Custom parameters definition)	
Unit Nom. Power	595 Wp
Number of PV modules	208 units
Nominal (STC)	124 kWp

Inverter

Manufacturer	SolarEdge
Model	SE30KUS
(Original PVsyst database)	
Unit Nom. Power	30.0 kWac
Number of inverters	4 units
Total power	120 kWac

Array #1 - O1

Orientation	#1		
Tilt/Azimuth	14/-177 °		
Number of PV modules	16 units	Number of inverters	0.3 unit
Nominal (STC)	9.52 kWp	Total power	9.2 kWac
Optimizer Array	1 String x 16 In series		
At operating cond. (50°C)		Operating voltage	840 V
Pmpp	8.69 kWp	Pnom ratio (DC:AC)	0.90
Output of optimizers			
Voper	840 V		
I at Poper	10 A		

SolarEdge Power Optimizer

Model	P601 Worldwide
Unit Nom. Power	600 W
Input modules	One module

Array #3 - O3

Orientation	#3		
Tilt/Azimuth	67/102 °		
Number of PV modules	64 units	Number of inverters	1 unit
Nominal (STC)	38.1 kWp	Total power	36.9 kWac
Optimizer Array	4 Strings x 16 In series		
At operating cond. (50°C)		Operating voltage	840 V
Pmpp	34.8 kWp	Pnom ratio (DC:AC)	0.96
Output of optimizers			
Voper	840 V		
I at Poper	41 A		

SolarEdge Power Optimizer

Model	P601 Worldwide
Unit Nom. Power	600 W
Input modules	One module

PV Array Characteristics

Array #4 - O4

Orientation	#4		
Tilt/Azimuth	52/7 °		
Number of PV modules	64 units	Number of inverters	1 unit
Nominal (STC)	38.1 kWp	Total power	36.9 kWac
Optimizer Array	4 Strings x 16 In series		
At operating cond. (50°C)		Operating voltage	840 V
Pmpp	34.8 kWp	Pnom ratio (DC:AC)	1.09
Output of optimizers			
Voper	840 V		
I at Poper	41 A		

SolarEdge Power Optimizer

Model	P750 Worldwide
Unit Nom. Power	750 W
Input modules	One module

Array #5 - O5

Orientation	#5		
Tilt/Azimuth	66/-90 °		
Number of PV modules	64 units	Number of inverters	1.8 units
Nominal (STC)	38.1 kWp	Total power	36.9 kWac
Optimizer Array	4 Strings x 16 In series		
At operating cond. (50°C)		Operating voltage	840 V
Pmpp	34.8 kWp	Pnom ratio (DC:AC)	0.99
Output of optimizers			
Voper	840 V		
I at Poper	41 A		

SolarEdge Power Optimizer

Model	P601 Worldwide
Unit Nom. Power	600 W
Input modules	One module

Array #2 - O2

Orientation	#2
Tilt/Azimuth	80/-174 °

PV module		**Inverter**	
Manufacturer	SFS	Manufacturer	SolarEdge
Model	SFS-Assembly	Model	SE7K-EU-APAC
(Custom parameters definition)		(Original PVsyst database)	
Unit Nom. Power	595 Wp	Unit Nom. Power	7.0 kWac
Number of PV modules	64 units	Number of inverters	2 units
Nominal (STC)	38.1 kWp	Total power	14.0 kWac
Optimizer Array	4 Strings x 16 In series	Operating voltage	750 V
At operating cond. (50°C)		Pnom ratio (DC:AC)	0.85
Pmpp	34.8 kWp		
Output of optimizers			
Voper	750 V		
I at Poper	46 A		

SolarEdge Power Optimizer

Model	P601 Worldwide
Unit Nom. Power	600 W
Input modules	One module

PV Array Characteristics

Physical inverters

SE30KUS
Inverter #1 with 4 strings
1*16, 2*16, 1*16optimizers

SE30KUS
Inverter #2 with 4 strings
2 * 16 P601 Worldwide and 2 * 16 P750 Worldwide

SE30KUS
Inverter #3 with 4 strings
1 * 16 P750 Worldwide and 3 * 16 P601 Worldwide

SE30KUS
Inverter #4 with one string
1 strings of 16 optimizers P601 Worldwide

SE7K-EU-APAC
Inverter #5 with 3 strings
3 strings of 16 optimizers P601 Worldwide

SE7K-EU-APAC
Inverter #6 with one string
1 strings of 16 optimizers P601 Worldwide

Total PV power		**Total inverter power**	
Nominal (STC)	162 kWp	Total power	134 kWac
Total	272 modules	Number of inverters	6 units
Module area	760 m²	Pnom ratio	1.21

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 Quality Loss
Loss Fraction -0.8 %

Module mismatch losses
Loss Fraction (Fixed voltage) 0.0 %

IAM loss factor
Incidence effect (IAM): Fresnel smooth glass, n = 1.526

0°	30°	50°	60°	70°	75°	80°	85°	90°
1.000	0.998	0.981	0.948	0.862	0.776	0.636	0.403	0.000

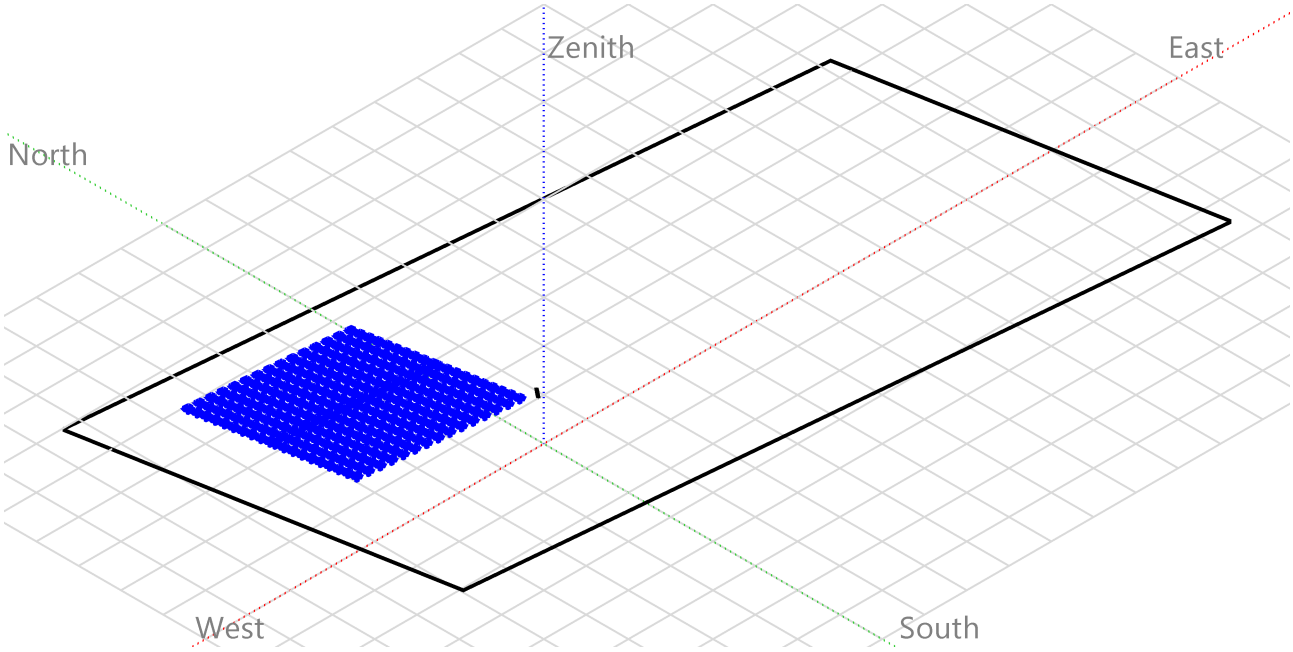
DC wiring losses

Global wiring resistance 10 mΩ
Loss Fraction 1.5 % at STC

Array #1 - O1		**Array #2 - O2**	
Global array res.	1111 mΩ	Global array res.	221 mΩ
Loss Fraction	1.5 % at STC	Loss Fraction	1.5 % at STC
Array #3 - O3		**Array #4 - O4**	
Global array res.	278 mΩ	Global array res.	278 mΩ
Loss Fraction	1.5 % at STC	Loss Fraction	1.5 % at STC
Array #5 - O5			
Global array res.	278 mΩ		
Loss Fraction	1.5 % at STC		

Near shadings parameter

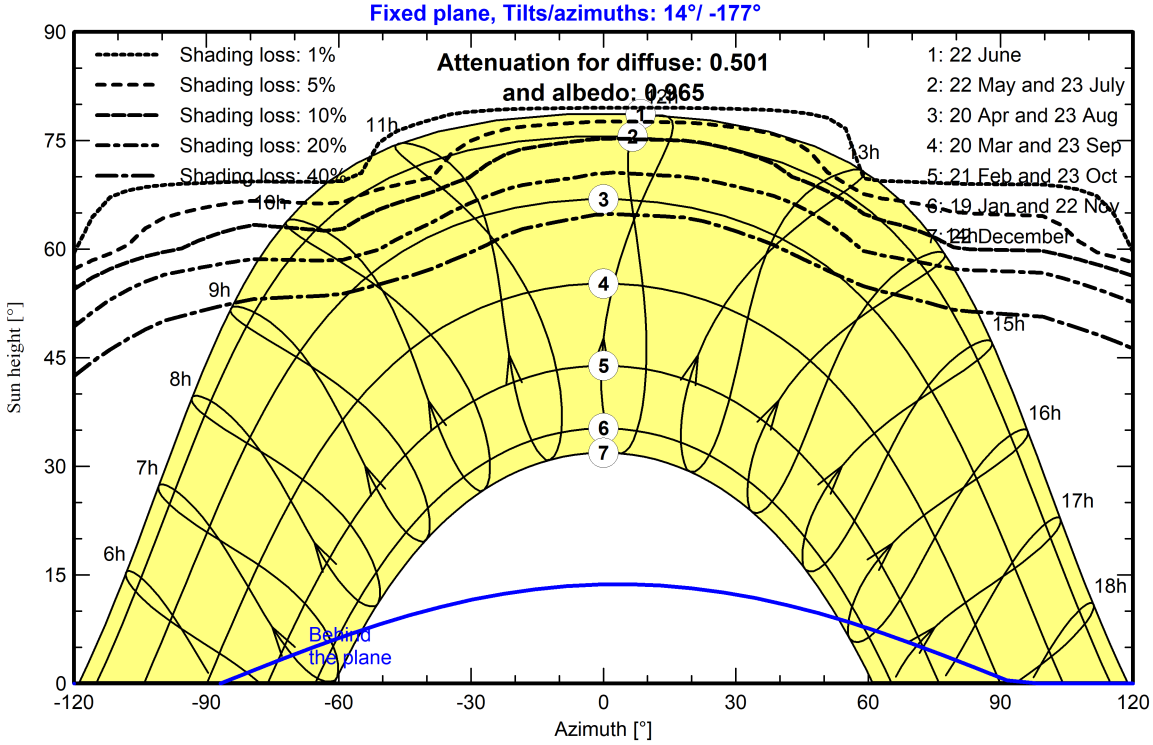
Perspective of the PV-field and surrounding shading scene



Iso-shadings diagram

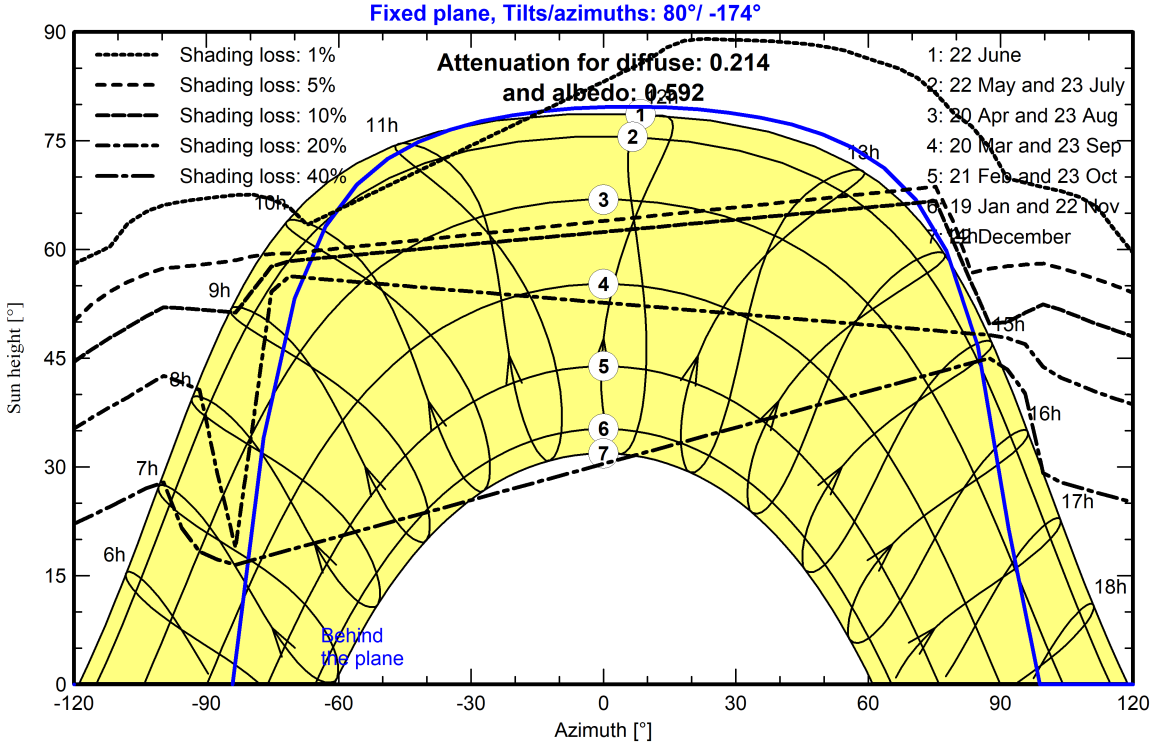
Orientation #1

Fixed plane, Tilts/azimuths: 14°/ -177°



Orientation #2

Fixed plane, Tilts/azimuths: 80°/ -174°



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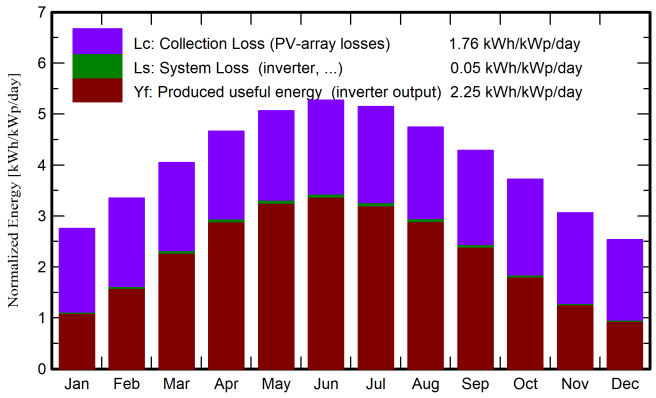
Main results

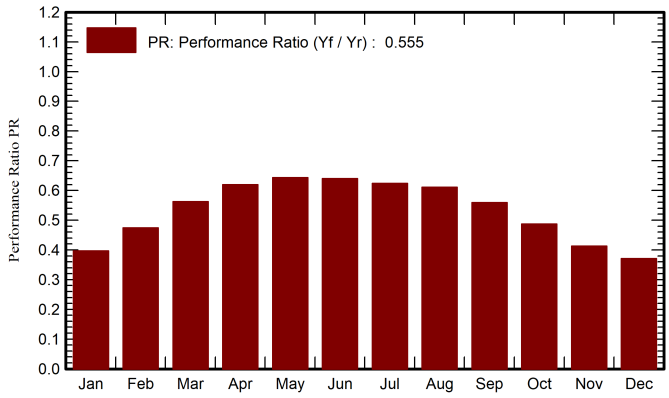
System Production

Produced Energy	133083 kWh/year	Specific production	822 kWh/kWp/year
		Performance Ratio PR	55.53 %

Normalized productions (per installed kWp)



Performance Ratio PR



Balances and main results

	GlobHor kWh/m²	DiffHor kWh/m²	T_Amb °C	GlobInc kWh/m²	GlobEff kWh/m²	EArray kWh	E_Grid kWh	PR ratio
January	97.9	30.21	6.64	85.4	36.2	5635	5491	0.397
February	116.0	31.68	7.18	93.8	47.4	7352	7191	0.474
March	173.1	45.07	10.03	125.5	76.6	11661	11423	0.563
April	206.1	53.38	12.09	139.9	94.9	14317	14041	0.620
May	242.2	51.40	16.66	157.0	112.9	16646	16333	0.643
June	246.5	56.62	21.84	158.2	115.5	16692	16377	0.640
July	246.9	57.73	25.78	159.6	115.6	16411	16098	0.623
August	225.5	52.03	25.38	147.2	104.2	14838	14553	0.611
September	183.2	43.67	21.71	128.6	82.0	11874	11638	0.559
October	148.7	33.78	16.06	115.3	62.4	9290	9091	0.487
November	108.9	27.17	10.19	91.8	40.9	6280	6129	0.412
December	87.3	28.57	6.34	78.5	31.0	4847	4718	0.371
Year	2082.3	511.31	15.04	1480.7	919.6	135842	133083	0.555

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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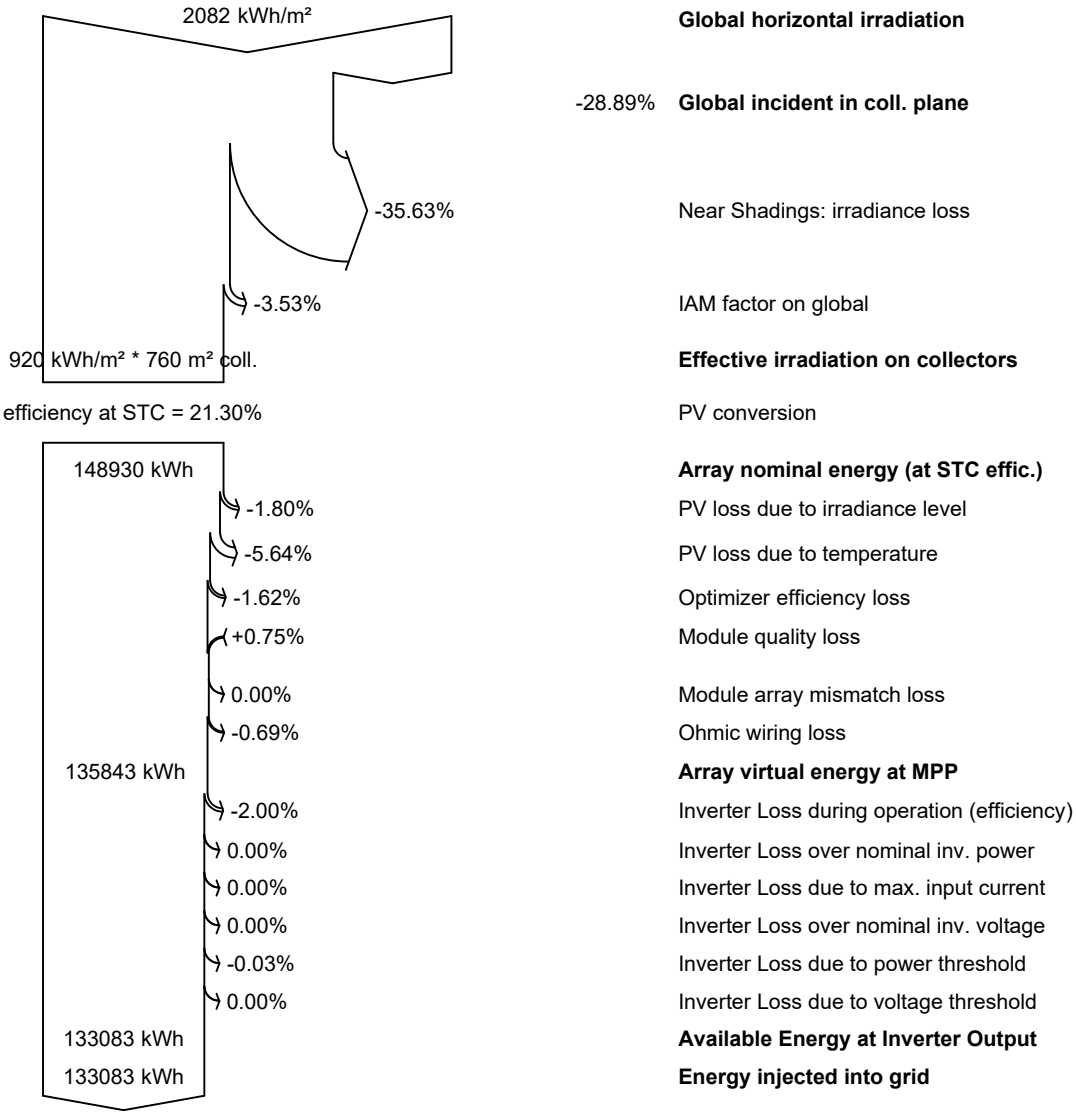
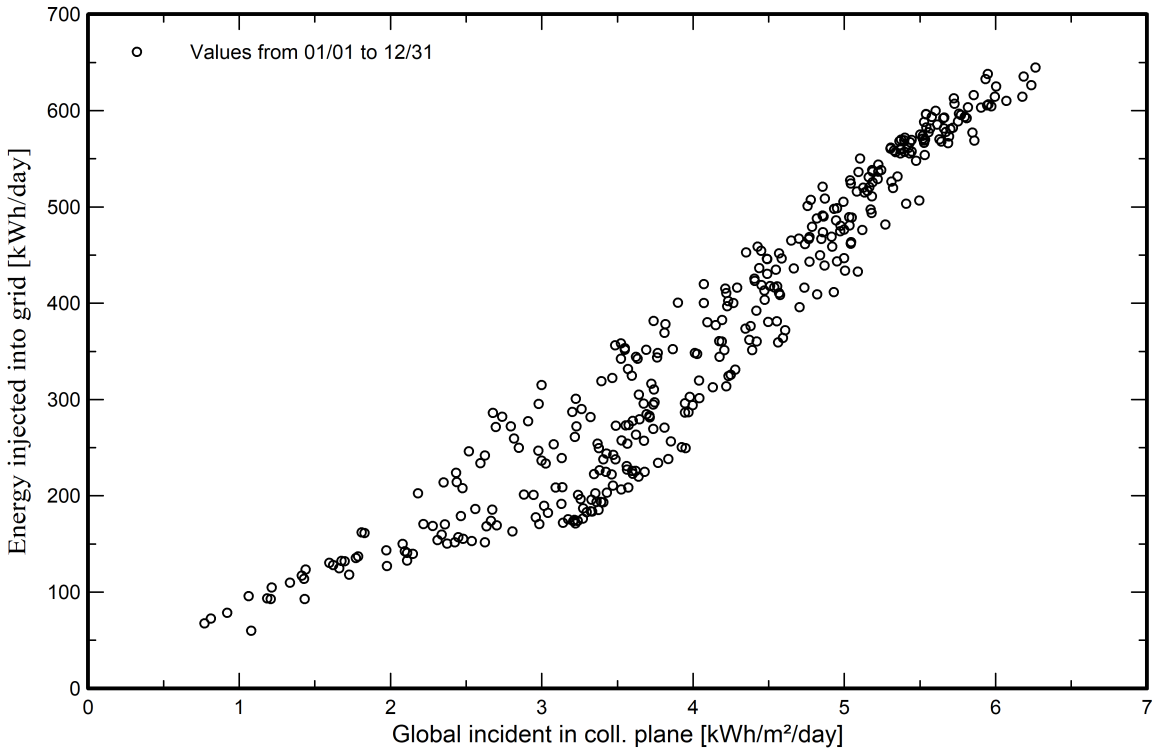
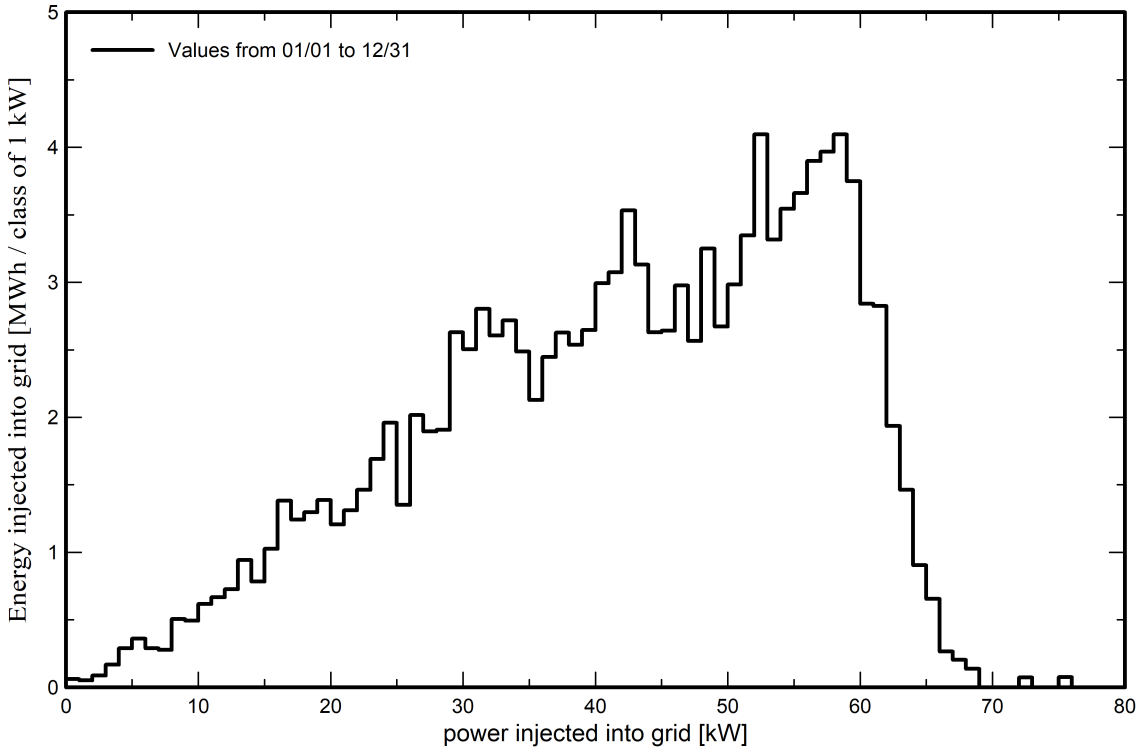
Loss diagram



Predef. graphs

Daily Input/Output diagram



System Output Power Distribution