

# PVsyst - Simulation report

## Grid-Connected System

Project: Stolpe

Variant: Agri 41°

Tracking system with backtracking

System power: 86.07 MWp

Stolpe - Germany

**Author**

Safvi Energie UG (Germany)



**PVsyst V8.1.3**

VC9, Simulation date:  
03/06/26 10:20  
with V8.1.3

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**Project summary**

<b>Geographical Site</b>		<b>Situation</b>		<b>Project settings</b>	
<b>Stolpe</b>		Latitude	53.8614 °(N)	Albedo	0.20
Germany		Longitude	13.5875 °(E)		
		Altitude	11 m		
		Time zone	UTC+1		
<b>Weather data</b>					
Stolpe					
Meteonorm 8.2 (2001-2020), Sat=100% - Synthetic					

**System summary**

<b>Grid-Connected System</b>		<b>Tracking system with backtracking</b>			
<b>Orientation #1</b>		<b>Near Shadings</b>		<b>User's needs</b>	
<b>Tracking plane, tilted axis</b>		Linear shadings : Fast (table)		Unlimited load (grid)	
Avg axis tilt	1.2 °				
Avg axis azim.	0 °				
Phi min / max.	-/+ 41 °				
Diffuse shading	all trackers				
<b>Tracking algorithm</b>					
Irradiance optimization					
Backtracking activated					
<b>System information</b>					
<b>PV Array</b>					
Nb. of modules	135538 units	<b>Inverters</b>		216 units	
Pnom total	86.07 MWp	Nb. of units		75600 kWac	
		Total power		58.00 MWac	
		Grid power limit		1.484	
		Grid lim. Pnom ratio			

**Results summary**

Simulation step	Hourly				
Produced Energy	103126501 kWh/year	Specific production	1198 kWh/kWp/year	Perf. Ratio PR	86.78 %
				Bifacial perf. ratio	84.00 %

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**General parameters**

<b>Grid-Connected System</b>		<b>Tracking system with backtracking</b>			
<b>Simulation step</b> Hourly				<b>Models used</b>	
<b>Orientation #1</b>		<b>Field properties</b>		Transposition Perez	
<b>Tracking plane, tilted axis</b>		<b>Nb. of trackers</b> 1404 units		Diffuse Perez, Meteonorm	
Avg axis tilt	1.2 °	<b>Tracking plane, tilted axis</b>		Circumsolar separate	
Avg axis azim.	0 °	<b>Sizes</b>			
Phi min / max.	-/+ 41 °	Tracker Spacing		9.60 m	
Diffuse shading	all trackers	Sensitive width		4.78 m	
<b>Tracking algorithm</b>		GCR Shading		49.8 %	
Irradiance optimization		<b>Backtracking limit angle</b>			
Backtracking activated		Phi limits		+/- 60.1 °	
		<b>Backtracking parameters</b>			
		Backtracking pitch		9.60 m	
		Backtracking width		4.78 m	
		Left inactive band		0.00 m	
		Right inactive band		0.00 m	
		GCR Backtracking		49.8 %	
		Parameters choice		Automatic	
<b>Horizon</b> Free Horizon		<b>Near Shadings</b> Linear shadings : Fast (table)		<b>User's needs</b> Unlimited load (grid)	
<b>Bifacial system definition</b>				<b>Grid power limitation</b>	
<b>Orientation #1</b>				Active power 58.00 MWac	
<b>Bifacial system</b>				Pnom ratio 1.484	
Model	Unlimited Trackers 2D model			Limit applied at the injection point	
<b>Bifacial model geometry</b>					
Tracker Spacing	9.60 m				
Tracker width	4.78 m				
Axis height above ground	2.10 m				
Nb. of sheds	307 units				
<b>Bifacial model definitions</b>					
Ground albedo	0.20				
Bifaciality factor	80 %				
Rear shading factor	5.0 %				
Rear mismatch loss	10.0 %				
Shed transparent fraction	0.0 %				

**PV Array Characteristics**

<b>PV module</b>		<b>Inverter</b>	
Manufacturer	Jinkosolar	Manufacturer	Sungrow
Model	JKM-635N-66HL4-BDV	Model	SG350-HX
(Original PVsyst database)		(Original PVsyst database)	
Unit Nom. Power	635 Wp	Unit Nom. Power	350 kWac
Number of PV modules	135538 units	Number of inverters	216 units
Nominal (STC)	86.07 MWp	Total power	75600 kWac
Modules	5213 units x 26 In series	Operating voltage	500-1450 V
<b>At operating cond. (50°C)</b>		Pnom ratio (DC:AC)	1.14
Pmpp	79.81 MWp	Power sharing within this inverter	
U mpp	989 V		
I mpp	80739 A		



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**PV Array Characteristics**

Total PV power		Total inverter power	
Nominal (STC)	86067 kWp	Total power	75600 kWac
Total	135538 modules	Number of inverters	216 units
Module area	366114 m <sup>2</sup>	Pnom ratio	1.14
Cell area	341897 m <sup>2</sup>		

**Array losses**

Array Soiling Losses		Thermal Loss factor		DC wiring losses				
Loss Fraction	1.8 %	Module temperature according to irradiance		Global array res.	0.20 mΩ			
		Uc (const)	29.0 W/m <sup>2</sup> K	Loss Fraction	1.50 % at STC			
		Uv (wind)	0.0 W/m <sup>2</sup> K/m/s					
Module Quality Loss		Module mismatch losses		Strings Mismatch loss				
Loss Fraction	-0.75 %	Loss Fraction	2.00 % at MPP	Loss Fraction	0.05 %			
<b>IAM loss factor</b>								
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	0.963	0.892	0.814	0.679	0.438	0.000

**System losses**

Auxiliary losses	
Proportional to Power	5.0 W/kW
0.0 kW from Power thresh.	

**AC wiring losses**

Inv. output line up to MV transfo	
Inverter voltage	800 Vac tri
Loss Fraction	0.99 % at STC
<b>Inverter: SG350-HX</b>	
Wire section (216 Inv.)	Copper 216 x 3 x 150 mm <sup>2</sup>
Average wires length	128 m
<b>MV line up to Injection</b>	
MV Voltage	20 kV
Average each transformer	
Wires	Alu 3 x 1000 mm <sup>2</sup>
Length	500 m
Loss Fraction	0.11 % at STC

**AC losses in transformers**

MV transfo		Operating losses at STC (full system)	
Medium voltage	20 kV	Nb. identical MV transfos	3
<b>One transfo parameters</b>		Nominal power at STC	85.38 MVA
Nominal power at STC	28.46 MVA	Iron loss (24/24 Connexion)	75.60 kVA
Iron Loss (24/24 Connexion)	25.20 kVA	Copper loss	964.21 kVA
Iron loss fraction	0.09 % at STC		
Copper loss	321.40 kVA		
Copper loss fraction	1.13 % at STC		
Coils equivalent resistance	3 x 0.25 mΩ		

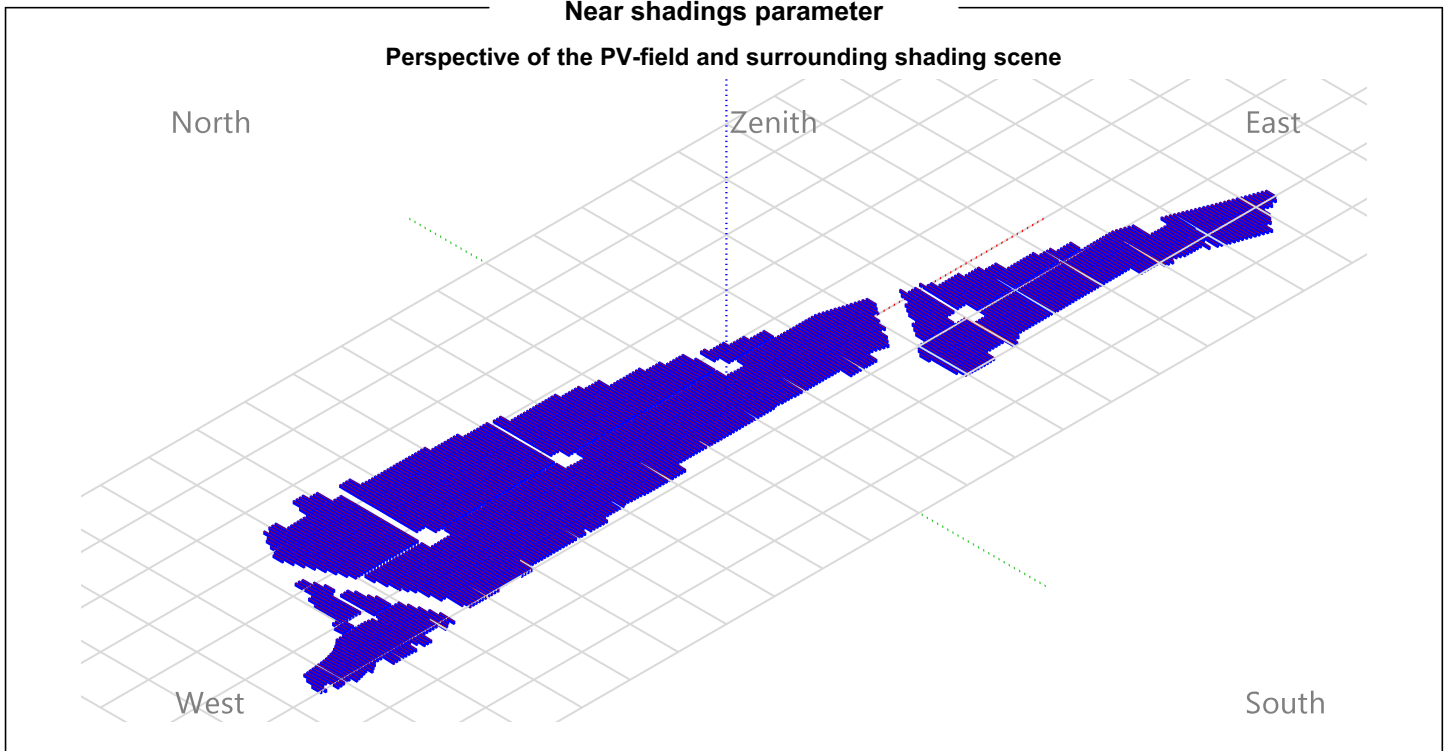


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Near shadings parameter

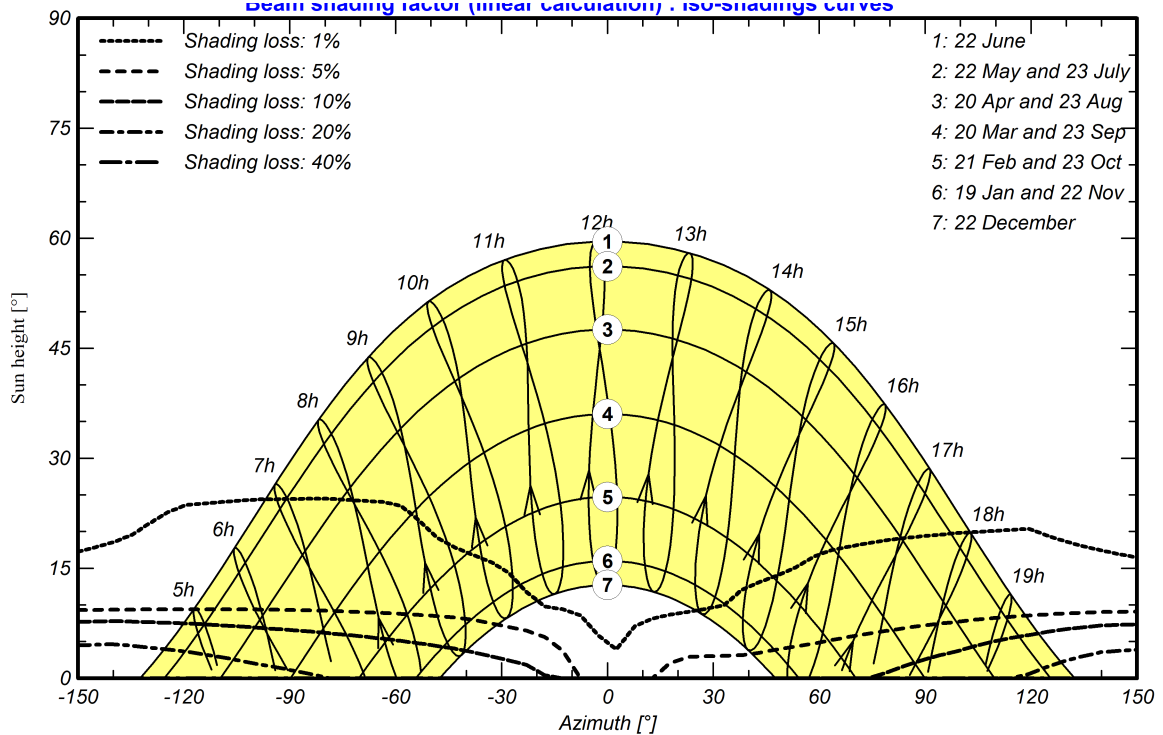
Perspective of the PV-field and surrounding shading scene



Iso-shadings diagram

Orientation #1 -

Beam shading factor (linear calculation) - ISO-shadings curves





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**Main results**

**Simulation step**

Hourly

**System Production**

Produced Energy 103126501 kWh/year

Specific production

1198 kWh/kWp/year

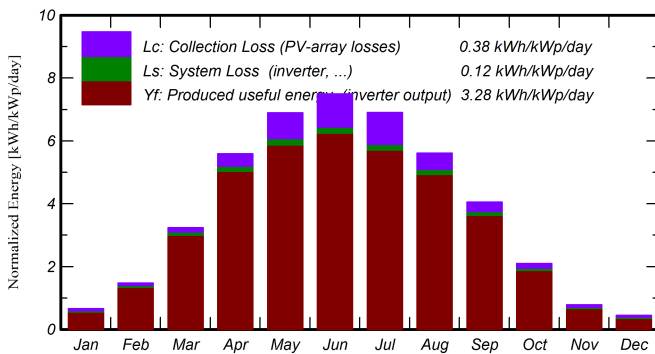
Perf. Ratio PR

86.78 %

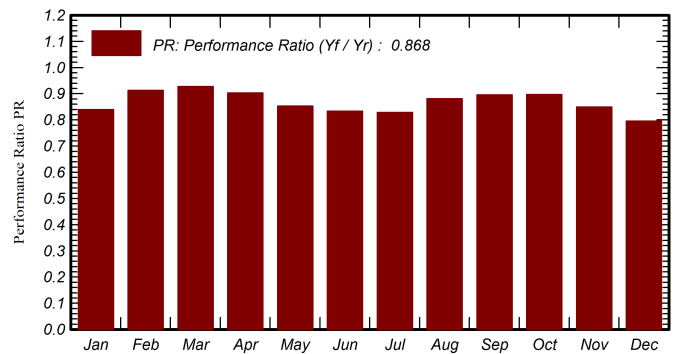
Bifacial perf. ratio

84.00 %

**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 kWh	E_Grid kWh	PR ratio	PRBifi ratio
January	16.2	10.93	0.27	20.6	18.3	1610166	1488527	0.840	0.809
February	34.2	24.53	0.92	41.4	38.0	3394504	3249184	0.913	0.877
March	77.2	39.28	3.90	100.4	94.2	8293613	8017849	0.928	0.898
April	129.5	58.47	8.72	167.6	158.9	13441289	13016444	0.903	0.875
May	167.4	71.92	13.84	213.6	203.4	16208469	15689522	0.853	0.827
June	176.8	78.71	16.91	224.8	213.8	16651337	16131999	0.834	0.808
July	168.3	74.77	19.71	213.9	203.5	15742150	15241009	0.828	0.802
August	138.3	73.18	19.17	173.9	164.6	13608152	13184663	0.881	0.852
September	95.0	48.62	14.57	121.7	114.6	9699142	9388146	0.896	0.867
October	50.4	27.93	9.60	65.2	60.7	5233936	5032054	0.896	0.867
November	19.4	14.00	4.96	23.7	21.4	1854470	1732124	0.850	0.817
December	11.2	8.21	1.55	14.0	12.3	1063709	954982	0.795	0.764
Year	1083.9	530.56	9.56	1380.7	1303.7	106800937	103126501	0.868	0.840

**Legends**

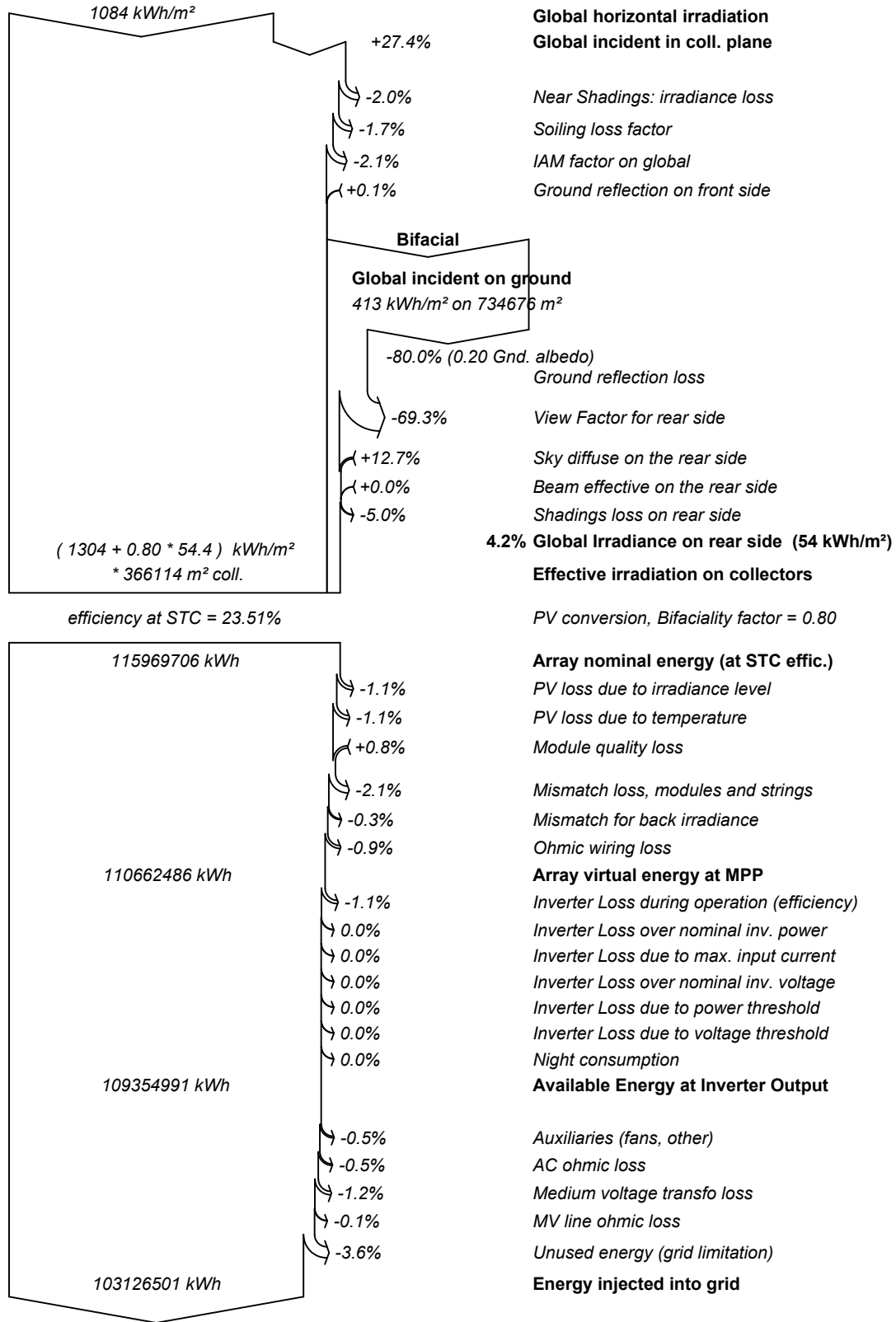
GlobHor	Global horizontal irradiation	EArray	Effective energy at the output of the array
DiffHor	Horizontal diffuse irradiation	E_Grid	Energy injected into grid
T_Amb	Ambient Temperature	PR	Performance Ratio
GlobInc	Global incident in coll. plane	PRBifi	Bifacial Performance Ratio
GlobEff	Effective Global,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



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**Loss diagram**



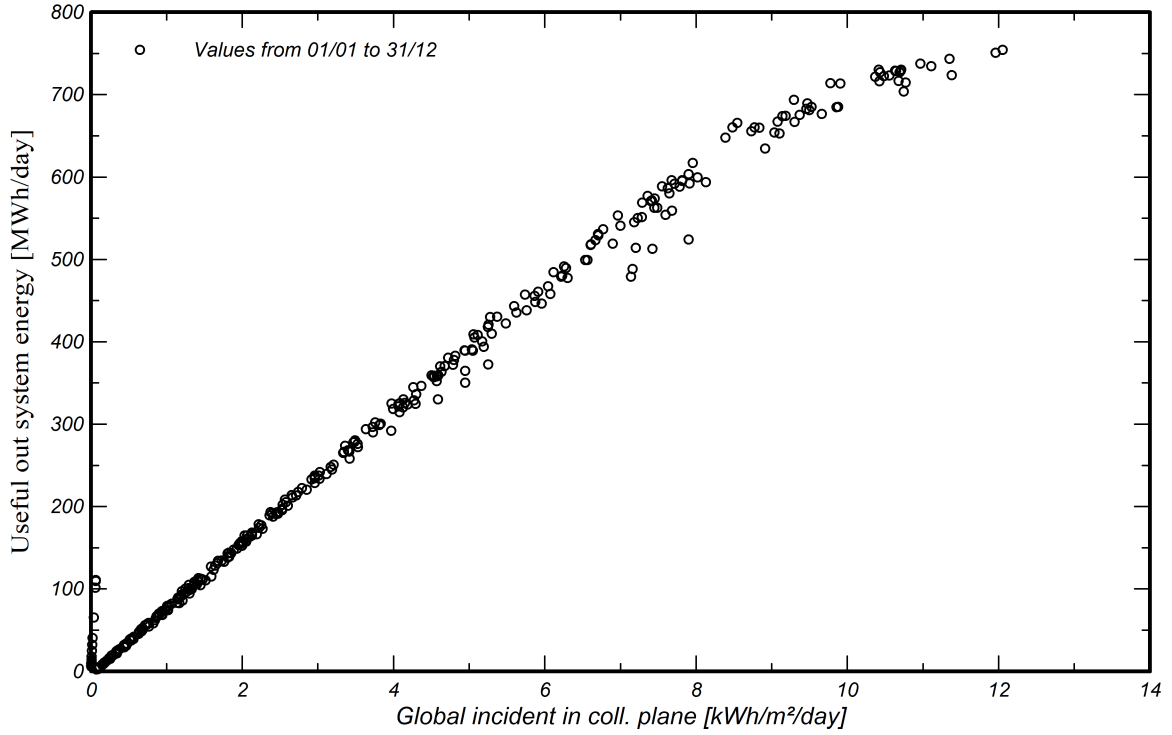


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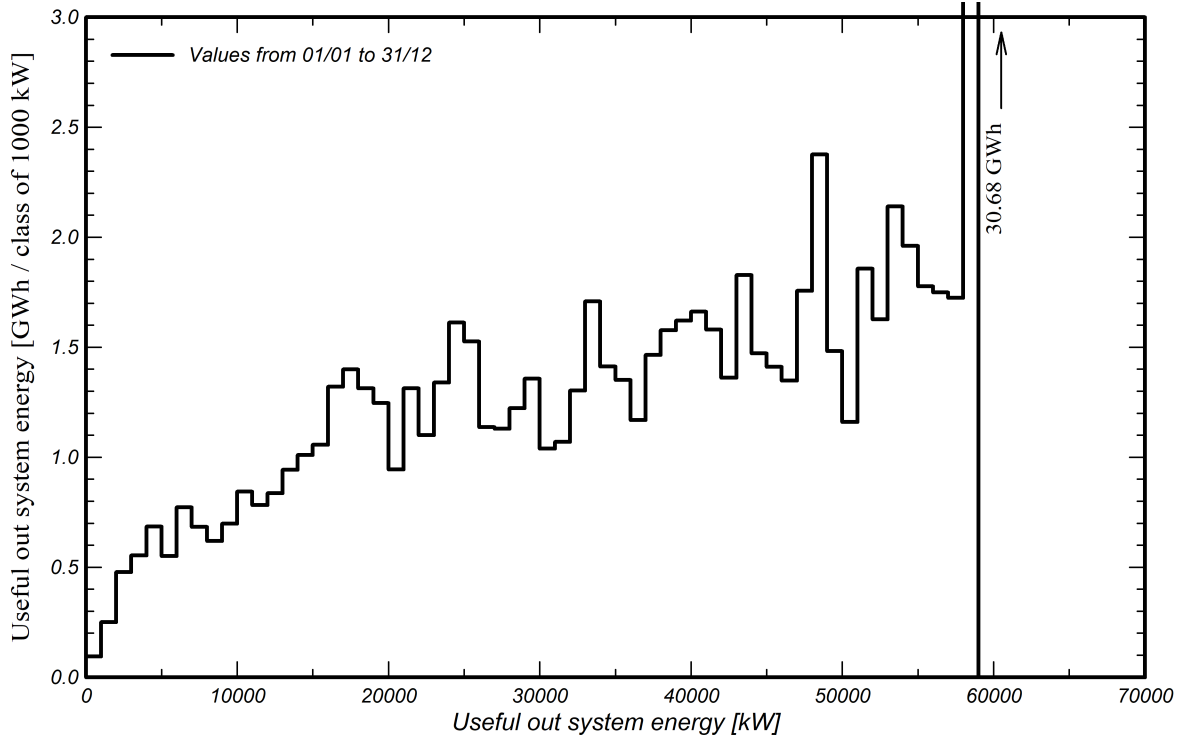
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Predef. graphs

Daily Input/Output diagram



System Output Power Distribution

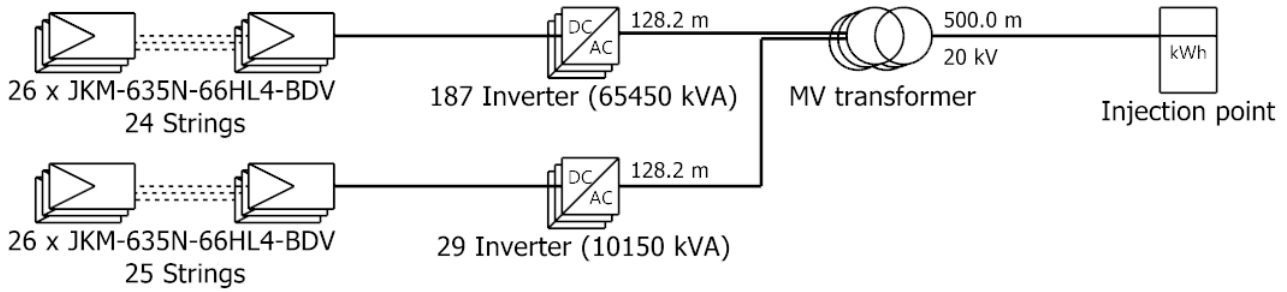




# Single-line diagram

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PV module	JKM-635N-66HL4-BDV
Inverter	SG350-HX
String	26 x JKM-635N-66HL4-BDV

Amt Anklam-Land  
 Öffentliche Bekanntmachung  
 Datum: 16.06.2026  
 Unterschrift: *Herold*

Stolpe

MSK Enplan GmbH

VC9 : Agri 41°

03/06/26