

Grid-Connected System: Simulation parameters

Project :	Grid-Connected Project at Almere						
Geographical Site	Almere						
Situation	Latitude	52.4°N	Country	The Netherlands			
Time defined as	Legal Time	Time zone UT+1	Longitude	5.2°E			
	Albedo	0.20	Altitude	1 m			
Meteo data:	Almere	Synthetic - Meteonorm 6.1					
Simulation variant :	system 2 - Silevo v2						
	Simulation date 11/03/14 10h52						
Simulation parameters							
Collector Plane Orientation	Tilt	40°	Azimuth	0°			
Models used	Transposition	Perez	Diffuse	Erbs, Meteonorm			
Horizon	Free Horizon						
Near Shadings	No Shadings						
PV Arrays Characteristics (2 kinds of array defined)							
PV module	Not Specified	Model Manufacturer	TriexTM U-Series 295W				
		Silevo, Inc					
Sub-array "Sub-array #1"	In series	8 modules	In parallel	1 strings			
Total number of PV modules	Nb. modules	8	Unit Nom. Power	295 Wp			
Array global power	Nominal (STC)	2360 Wp	At operating cond.	2206 Wp (50°C)			
Array operating characteristics (50°C)	U mpp	422 V	I mpp	5.2 A			
Sub-array "Sub-array #2"	In series	8 modules	In parallel	1 strings			
Total number of PV modules	Nb. modules	8	Unit Nom. Power	295 Wp			
Array global power	Nominal (STC)	2360 Wp	At operating cond.	2206 Wp (50°C)			
Array operating characteristics (50°C)	U mpp	422 V	I mpp	5.2 A			
Total Arrays global power	Nominal (STC)	5 kWp	Total	16 modules			
	Module area	27.0 m²					
Inverter	Model	Sunny Tripower 5000 TL-20					
	Manufacturer	SMA					
	Operating Voltage	245-800 V	Unit Nom. Power	5.00 kW AC			
Sub-array "Sub-array #1"	Nb. of inverters	1 * MPPT 0.52	Total Power	2.6 kW AC			
Sub-array "Sub-array #2"	Nb. of inverters	1 * MPPT 0.48	Total Power	2.4 kW AC			
Total	Nb. of inverters	1	Total Power	5 kW AC			
PV Array loss factors							
Array Soiling Losses			Loss Fraction	1.0 %			
Thermal Loss factor	Uc (const)	20.0 W/m ² K	Uv (wind)	0.0 W/m ² K / m/s			
Wiring Ohmic Loss	Array#1	1742 mOhm	Loss Fraction	2.0 % at STC			
	Array#2	1742 mOhm	Loss Fraction	2.0 % at STC			
	Global		Loss Fraction	2.0 % at STC			

Grid-Connected System: Simulation parameters (continued)

Module Quality Loss		Loss Fraction	1.5 %
Module Mismatch Losses		Loss Fraction	1.0 % at MPP
Incidence effect, ASHRAE parametrization	IAM = 1 - bo (1/cos i - 1)	bo Param.	0.04
System loss factors			
Wiring Ohmic Loss	Wires 47 m 3x2 mm ²	Loss Fraction	2.0 % at STC
User's needs : Unlimited load (grid)			

Grid-Connected System: Main results

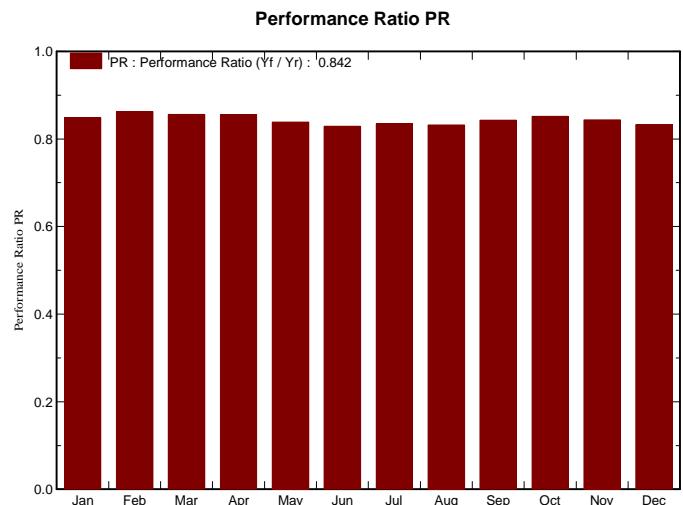
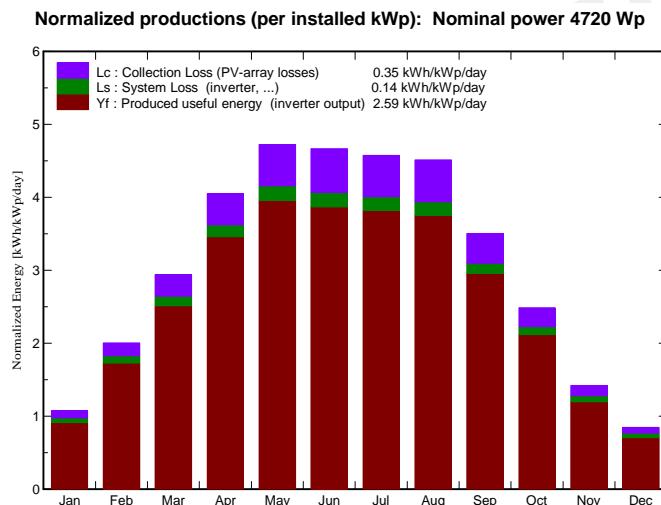
Project : Grid-Connected Project at Almere

Simulation variant : system 2 - Silevo v2

Main system parameters		System type	Grid-Connected		
PV Field Orientation		tilt	40°	azimuth	0°
PV modules		Model	TrixiTM U-Series 295W	Pnom	295 Wp
PV Array	Nb. of modules		16	Pnom total	4720 Wp
Inverter	Model		Sunny Tripower 5000 TL-20	Pnom	5.00 kW ac
User's needs	Unlimited load (grid)				

Main simulation results

System Production	Produced Energy Performance Ratio PR	4458 kWh/year 84.2 %	Specific prod.	945 kWh/kWp/year
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system 2 - Silevo v2 Balances and main results

	GlobHor kWh/m ²	T Amb °C	GlobInc kWh/m ²	GlobEff kWh/m ²	EArray kWh	E_Grid kWh	EffArrR %	EffSysR %
January	19.2	2.88	33.4	32.2	143.4	133.9	15.87	14.81
February	36.0	3.90	56.1	54.2	241.7	228.5	15.94	15.07
March	68.3	6.17	91.1	88.1	387.2	368.0	15.73	14.95
April	108.1	9.26	121.5	117.1	513.2	490.3	15.63	14.93
May	145.5	13.14	146.4	141.1	608.3	579.4	15.36	14.64
June	146.7	15.67	140.0	134.6	575.8	547.6	15.22	14.47
July	144.7	17.08	141.9	136.6	586.4	559.0	15.29	14.58
August	127.9	17.79	140.0	135.1	576.3	549.7	15.23	14.53
September	84.0	14.75	105.2	101.6	438.5	418.4	15.42	14.71
October	50.9	10.60	77.1	74.5	326.2	309.9	15.66	14.87
November	23.5	6.56	42.6	41.2	181.6	169.8	15.75	14.73
December	14.6	3.41	26.4	25.4	112.3	103.6	15.77	14.54
Year	969.5	10.14	1121.6	1081.7	4690.8	4458.1	15.47	14.70

Legends:	GlobHor	Horizontal global 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	EffArrR	Effic. Eout array / rough area
	GlobEff	Effective Global, corr. for IAM and shadings	EffSysR	Effic. Eout system / rough area

Grid-Connected System: Loss diagram

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Inverter	Model	Sunny Tripower 5000 TL-20	Pnom	5.00 kW ac
User's needs	Unlimited load (grid)			

Loss diagram over the whole year

