Grid-Connected System: Simulation parameters

Project : **Precipice Aviation**

Geographical Site	**Precipice Aviation , India**		Country	**India**
Situation	Latitude	13.19° N	Longitude	77.67° E
Time defined as	Legal Time	Time zone UT+5.5	Altitude	904 m
	Albedo	0.20		
Meteo data:	**Precipice Aviation , India**	Meteonorm 7.2 (1981-2010), Sat=100% - Synthetic		

Simulation variant : **3D shading - 1000KW**

Simulation date 30/04/22 02h56

Simulation parameters	System type	**Sheds on ground**		
Collector Plane Orientation	Tilt	12°	Azimuth	0°
Sheds configuration	Nb. of sheds	75	Identical arrays	
	Sheds spacing	5.00 m	Collector width	4.05 m
Shading limit angle	Limit profile angle	39.1°	Ground cov. Ratio (GCR)	81.0 %
Models used	Transposition	Perez	Diffuse	Perez, Meteonorm
Horizon	Free Horizon			
Near Shadings	Linear shadings			
User's needs :	Unlimited load (grid)			

PV Array Characteristics

PV module	Si-poly	Model	**REC 350TP2S 72**	
Original PVsyst database		Manufacturer	REC	
Number of PV modules		In series	19 modules	In parallel 151 strings
Total number of PV modules		Nb. modules	2869	Unit Nom. Power 350 Wp
Array global power		Nominal (STC)	**1004 kWp**	At operating cond. 915 kWp (50°C)
Array operating characteristics (50°C)		U mpp	656 V	I mpp 1394 A
Total area		Module area	**5758 m²**	Cell area 5077 m²
Inverter		Model	**ECO 25.0-3-S**	
Original PVsyst database		Manufacturer	Fronius International	
Characteristics		Operating Voltage	580-850 V	Unit Nom. Power 25.0 kWac
Inverter pack		Nb. of inverters	34 units	Total Power 850 kWac
				Pnom ratio 1.18

PV Array loss factors

Array Soiling Losses			Loss Fraction	3.0 %
Thermal Loss factor	Uc (const)	29.0 W/m²K	Uv (wind)	0.0 W/m²K / m/s
Wiring Ohmic Loss	Global array res.	10 mOhm	Loss Fraction	2.0 % at STC
LID - Light Induced Degradation			Loss Fraction	2.0 %
Module Quality Loss			Loss Fraction	-0.4 %
Module Mismatch Losses			Loss Fraction	1.0 % at MPP
Strings Mismatch loss			Loss Fraction	0.10 %

Incidence effect (IAM): User defined profile

0°	30°	45°	60°	70°	75°	80°	85°	90°
1.000	1.000	1.000	0.974	0.907	0.832	0.688	0.445	0.000

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System loss factors

Wiring Ohmic Loss	Wires: 3x1000.0 mm² 173 m	Loss Fraction	2.0 % at STC
Unavailability of the system	7.3 days, 3 periods	Time fraction	2.0 %

Grid-Connected System: Near shading definition

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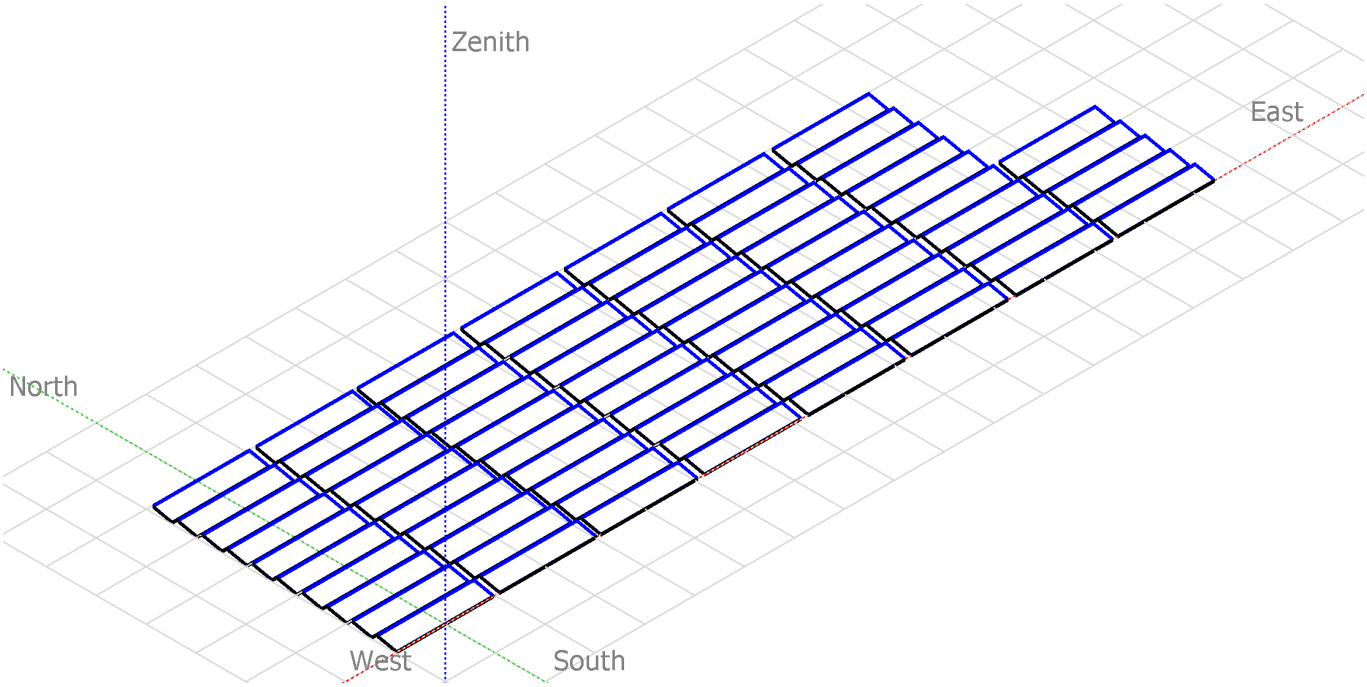
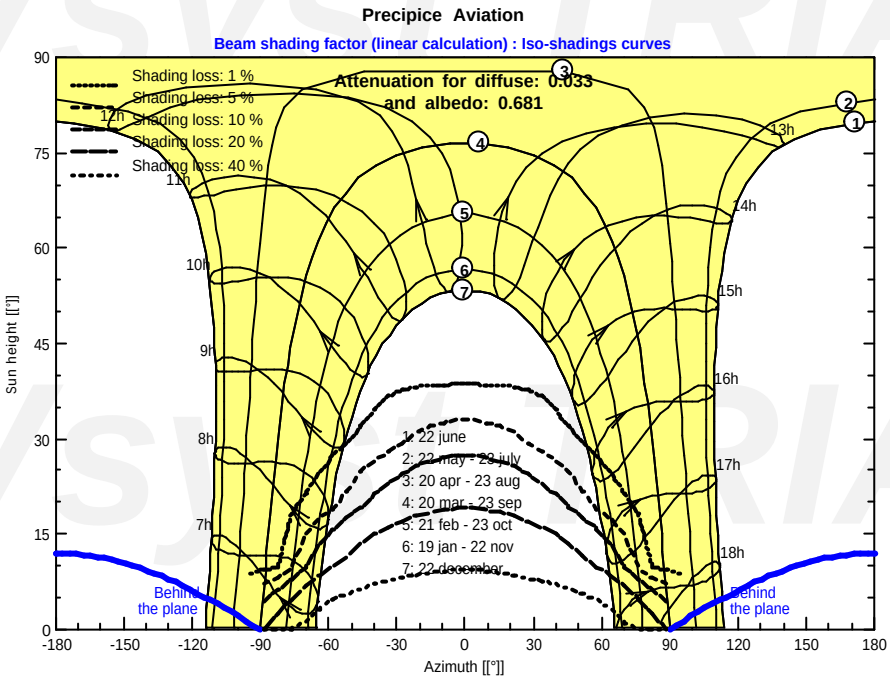
Main system parameters	System type	**Sheds on ground**		
Near Shadings	Linear shadings			
PV Field Orientation	tilt	12°	azimuth	0°
PV modules	Model	REC 350TP2S 72	Pnom	350 Wp
PV Array	Nb. of modules	2869	Pnom total	**1004 kWp**
Inverter	Model	ECO 25.0-3-S	Pnom	25.00 kW ac
Inverter pack	Nb. of units	34.0	Pnom total	**850 kW ac**
User's needs	Unlimited load (grid)			

Perspective of the PV-field and surrounding shading scene



Iso-shadings diagram



Grid-Connected System: Main results

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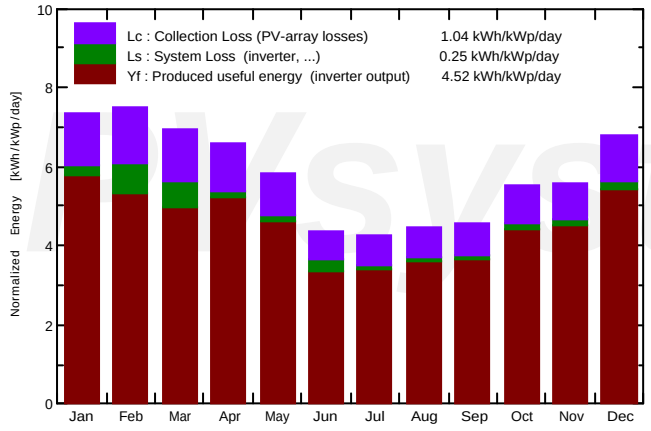
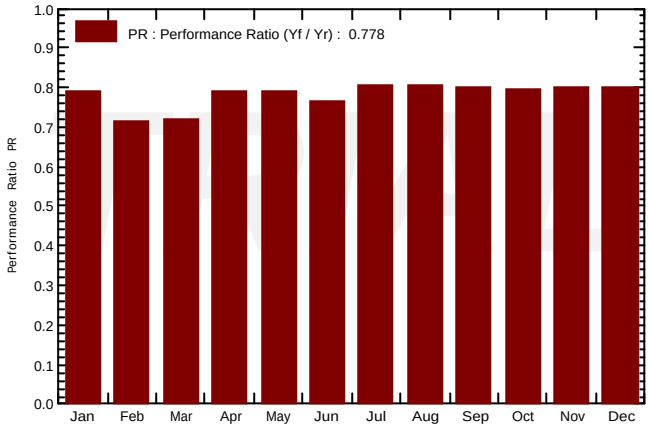
Main simulation results

System Production	**Produced Energy**	**1658 MWh/year**	Specific prod.	1651 kWh/kWp/year
	Performance Ratio PR	77.83 %		

Normalized productions (per installed kWp): Nominal power 1004 kWp



Performance Ratio PR



3D shading - 1000KW

Balances and main results

	GlobHor kWh/m²	DiffHor kWh/m²	T_Amb °C	GlobInc kWh/m²	GlobEff kWh/m²	EArray MWh	E_Grid MWh	PR
January	198.3	30.47	21.56	228.0	215.0	187.3	180.8	0.790
February	191.1	33.00	23.76	209.9	198.8	171.2	150.5	0.714
March	207.8	56.15	26.14	215.6	203.5	175.0	155.5	0.718
April	200.0	74.92	26.83	198.1	185.8	162.1	156.8	0.788
May	190.4	75.92	26.32	180.8	168.7	148.3	143.5	0.790
June	139.6	78.68	23.96	131.8	122.0	109.5	101.2	0.765
July	138.2	82.21	23.60	131.8	122.1	109.9	106.4	0.804
August	142.0	78.97	23.23	138.7	129.0	115.7	112.0	0.804
September	135.3	69.21	23.27	136.8	127.5	113.5	109.8	0.799
October	162.1	61.39	23.10	171.5	161.3	141.6	136.8	0.795
November	151.9	53.49	21.74	168.1	158.1	140.3	135.6	0.803
December	182.6	36.52	20.84	210.8	199.1	175.4	169.3	0.800
Year	2039.4	730.92	23.69	2121.8	1990.9	1749.8	1658.2	0.778

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	T amb.	E_Grid	Energy injected into grid
GlobInc	Global incident in coll. plane	PR	Performance Ratio

Grid-Connected System: Special graphs

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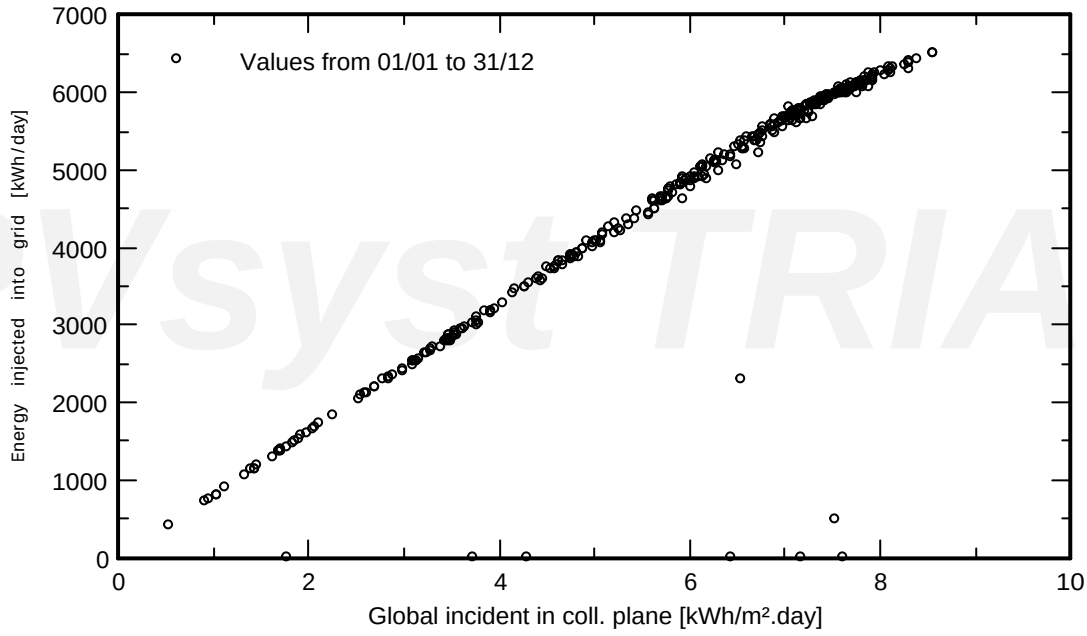
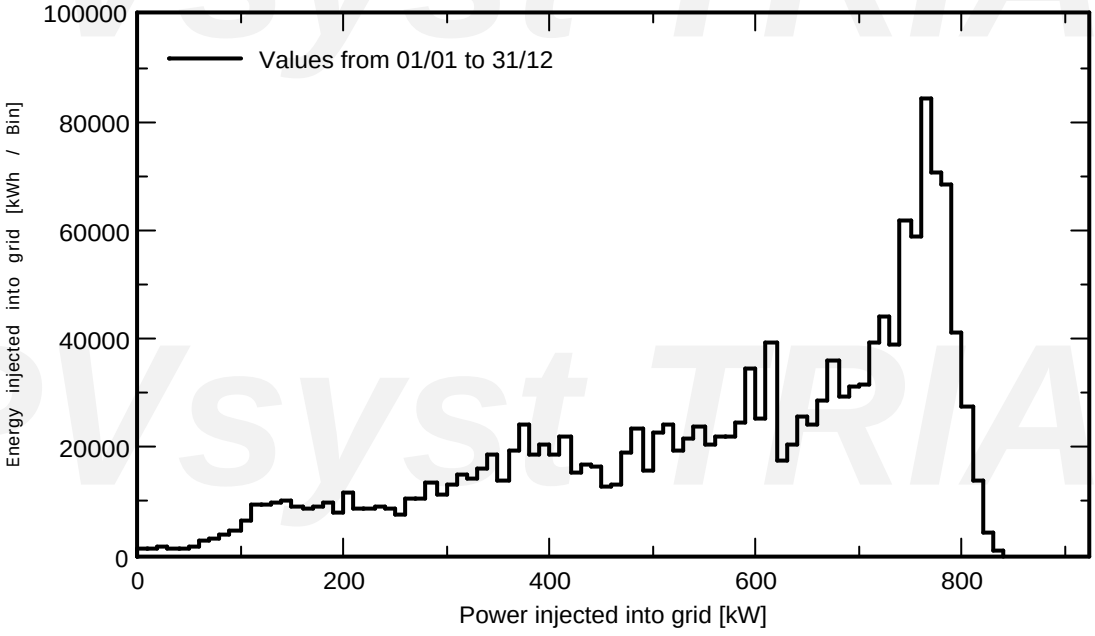
Daily Input/Output diagram



System Output Power Distribution



Grid-Connected System: Loss diagram

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Loss diagram over the whole year