Grid-Connected System: Simulation parameters

Project : **Italco, Dubai**

Geographical Site	**Italco, Dubai**		Country	**United Arab Emirates**
Situation	Latitude	25.24° N	Longitude	55.36° E
Time defined as	Legal Time	Time zone UT+4	Altitude	9 m
	Albedo	0.20		
Meteo data:	**Italco, Dubai**	Meteonorm 7.2 (1992-2004), Sat=83% - Synthetic		

Simulation variant : **Detailed Losses**

Simulation date	30/04/22 00h41
Simulation for the	**10th year of operation**

Simulation parameters	System type	**No 3D scene defined, no shadings**		
Collector Plane Orientation	Tilt	25°	Azimuth	60°
Models used	Transposition	Perez	Diffuse	Perez, Meteonorm
Horizon	Free Horizon			
Near Shadings	No Shadings			
User's needs :	Unlimited load (grid)			

PV Array Characteristics

PV module Si-mono	Model	**TSM-345DD14A(II)**		
Original PVsyst database	Manufacturer	Trina Solar		
Number of PV modules	In series	19 modules	In parallel	15 strings
Total number of PV modules	Nb. modules	285	Unit Nom. Power	345 Wp
Array global power	Nominal (STC)	**98.3 kWp**	At operating cond.	88.7 kWp (50°C)
Array operating characteristics (50°C)	U mpp	653 V	I mpp	136 A
Total area	Module area	**553 m²**	Cell area	497 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	4 units	Total Power	100 kWac
			Pnom ratio	0.98

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.	107 mOhm	Loss Fraction	2.0 % at STC
LID - Light Induced Degradation			Loss Fraction	3.0 %
Module Quality Loss			Loss Fraction	-0.8 %
Module Mismatch Losses			Loss Fraction	1.0 % at MPP
Strings Mismatch loss			Loss Fraction	0.10 %
Module average degradation	Year no	10	Loss factor	0.4 %/year
Mismatch due to degradation	Imp RMS dispersion	0.4 %/year	Vmp RMS dispersion	0.4 %/year
Incidence effect, ASHRAE parametrization	IAM =	1 - bo (1/cos i - 1)	bo Param.	0.05

System loss factors

Wiring Ohmic Loss	Wires: 3x50.0 mm²	89 m	Loss Fraction	2.0 % at STC
Unavailability of the system	1.8 days, 5 periods		Time fraction	0.5 %

Grid-Connected System: Main results

Project : **Italco, Dubai**

Simulation variant : **Detailed Losses**

Simulation for the 10th year of operation

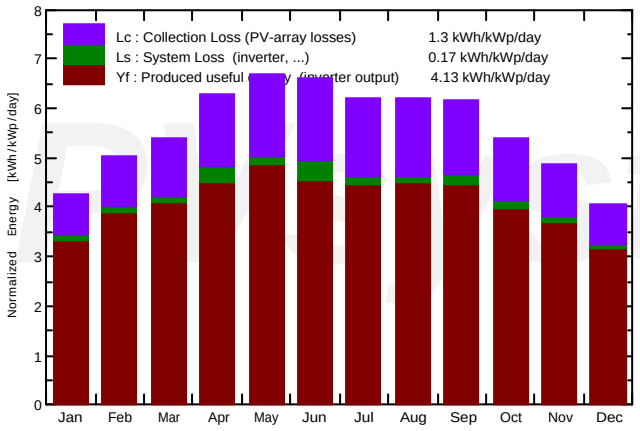
Main system parameters	System type	**No 3D scene defined, no shadings**			
PV Field Orientation	tilt	25°	azimuth	60°	
PV modules	Model	TSM-345DD14A(II)	Pnom	345 Wp	
PV Array	Nb. of modules	285	Pnom total	**98.3 kWp**	
Inverter	Model	ECO 25.0-3-S	Pnom	25.00 kW ac	
Inverter pack	Nb. of units	4.0	Pnom total	**100 kW ac**	
User's needs	Unlimited load (grid)				

Main simulation results

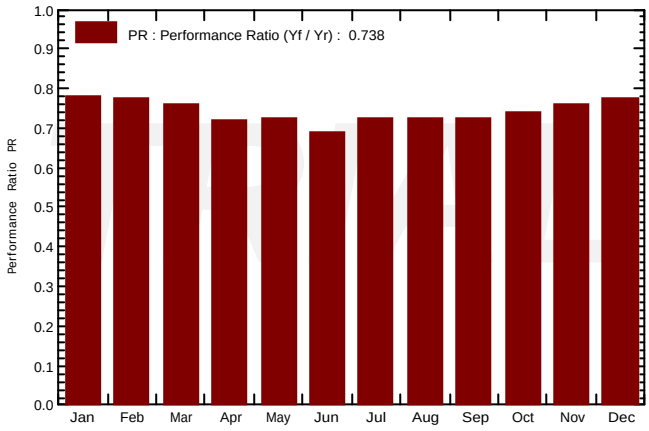
System Production — **Produced Energy** **148.2 MWh/year** — Specific prod. 1507 kWh/kWp/year

Performance Ratio PR 73.78 %

Normalized productions (per installed kWp): Nominal power 98.3 kWp



Performance Ratio PR



Detailed Losses

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	117.8	47.70	18.46	132.3	124.0	10.52	10.12	0.778
February	126.7	55.01	20.31	140.7	132.3	11.09	10.73	0.776
March	163.1	75.15	23.93	167.3	157.4	12.93	12.51	0.761
April	190.6	76.55	28.03	188.0	177.5	14.19	13.34	0.722
May	219.6	83.36	32.97	207.5	195.8	15.29	14.81	0.726
June	211.7	90.19	33.95	198.1	186.6	14.61	13.39	0.688
July	204.5	94.20	35.98	192.3	181.1	14.10	13.67	0.723
August	199.8	91.20	35.85	192.8	181.9	14.14	13.71	0.723
September	178.2	71.71	32.47	184.7	174.4	13.73	13.20	0.727
October	158.5	57.53	29.73	167.3	157.7	12.57	12.18	0.740
November	127.8	44.00	24.95	145.8	137.0	11.26	10.91	0.761
December	109.0	44.16	20.85	126.3	118.3	9.95	9.64	0.776
Year	2007.4	830.76	28.17	2043.0	1924.1	154.39	148.21	0.738

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

Project : **Italco, Dubai**

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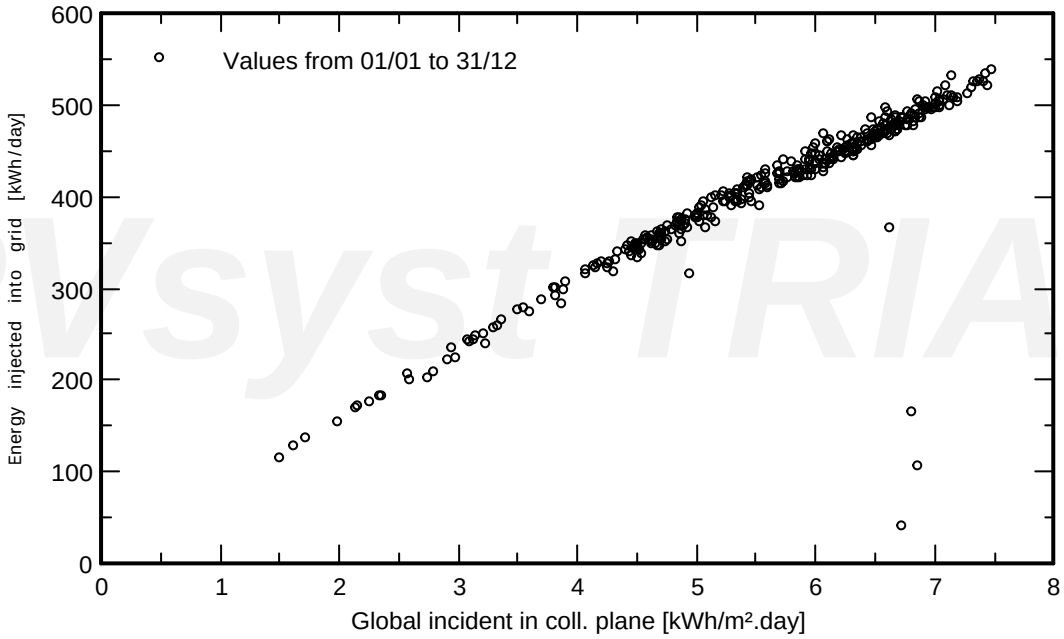
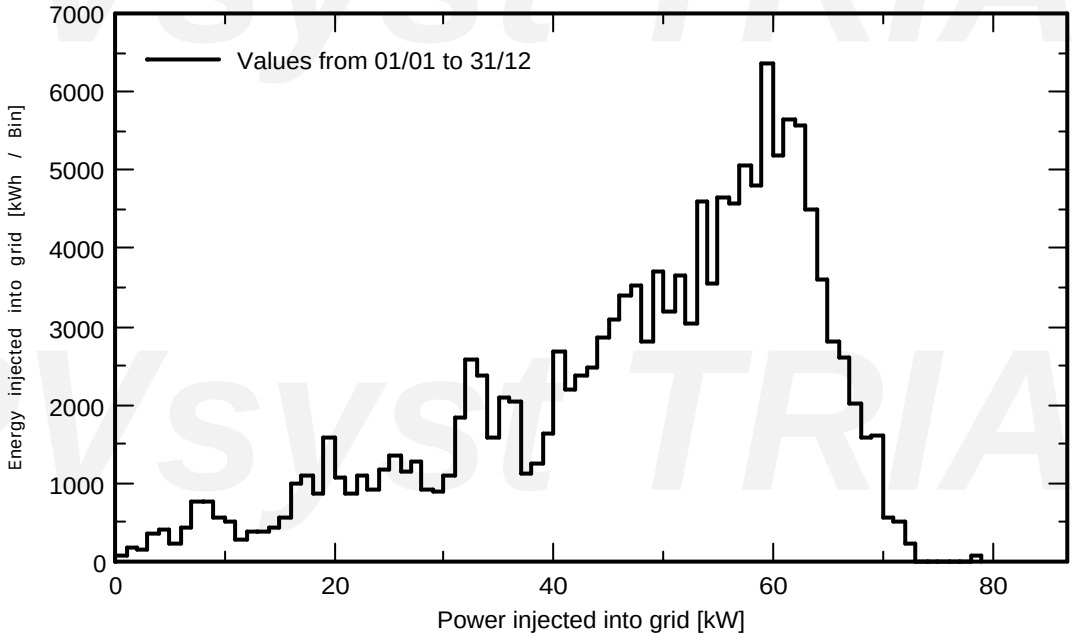
Daily Input/Output diagram



System Output Power Distribution



Grid-Connected System: Loss diagram

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Loss diagram over the whole year