

SOLAR PV PLANT ENGINEERING SERVICES

Dr. Satish Nair
Nordic (India) Solutions Pvt Ltd
Chennai

satish.nair@nordicindia.com
Phone +91 9840049116



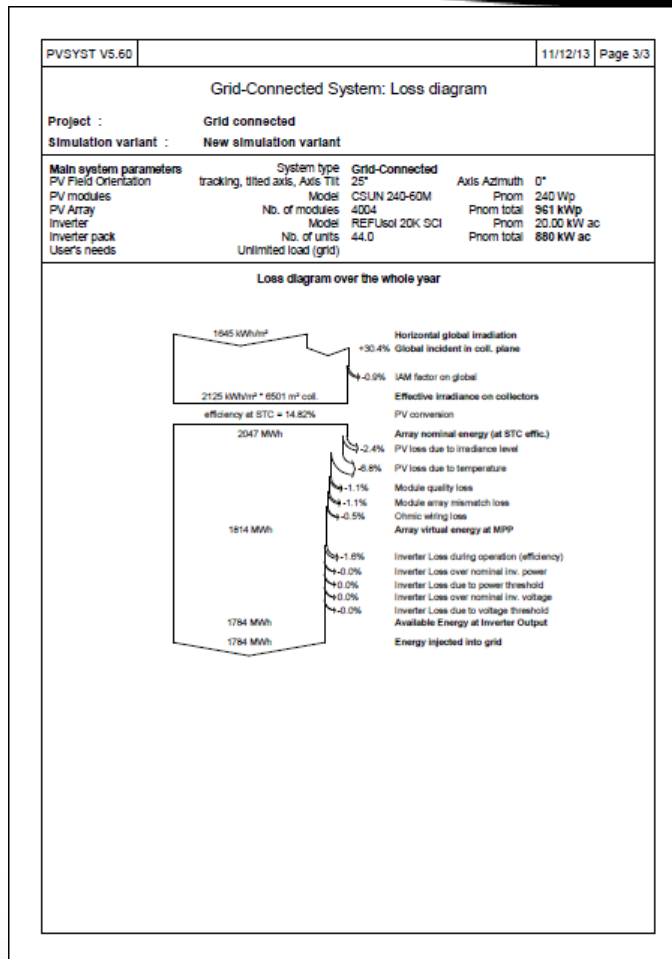
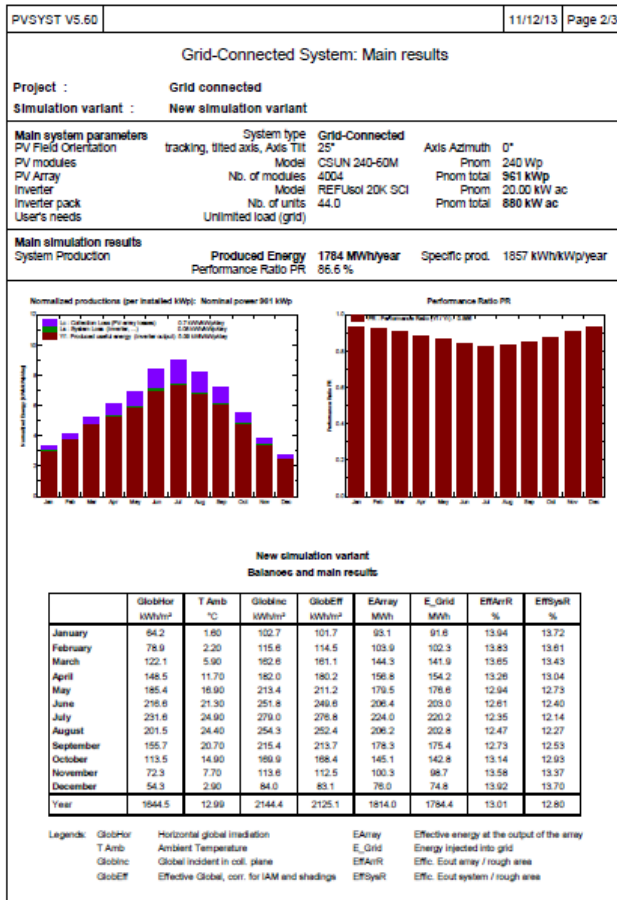
Engineering Services Offering

- PV Simulation with using PV Syst
- Electrical SLD's using Auto Cad (DC and AC)
- 2 D Design Drawings for module mounting structures using AutoCAD
- 3 D models for module mounting structures using CATIA
- 3D Animation for solar installations using 3ds Max
(See <http://www.youtube.com/watch?v=fhR-1yDfeKA>)
- Wind load study for module mounting structures using STAAD PRO V8i

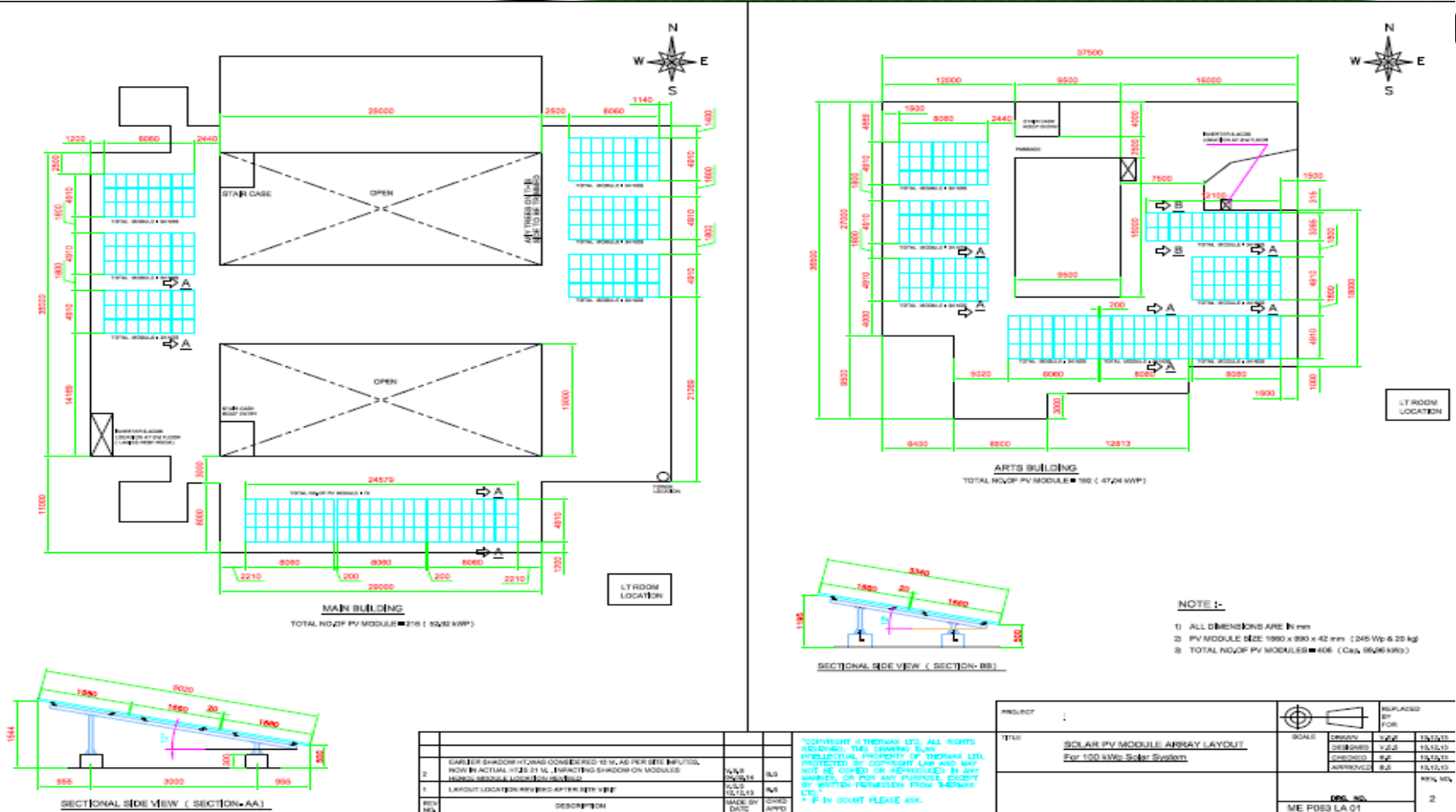
PVSyst Simulation – Page 1

PVSYST V5.60		11/12/13		Page 1/3	
Grid-Connected System: Simulation parameters					
Project : Grid connected					
Geographical Site		KIZILCA		Country Turkey	
Situation		Latitude 37.5°N		Longitude 34.7°E	
Time defined as		Legal Time Time zone UT+2		Altitude 1064 m	
Meteo data :		KIZILCA, Synthetic Hourly data			
Simulation variant :		New simulation variant			
		Simulation date 11/12/13 14h14			
Simulation parameters					
Tracking plane, tilted Axis		Axis Tilt 25°		Axis Azimuth 0°	
Rotation Limitations		Minimum Phi -40°		Maximum Phi 40°	
Backtracking strategy		Tracker Spacing 6.60 m		Collector width 3.00 m	
Inactive band		Left 0.00 m		Right 0.00 m	
Horizon		Free Horizon			
Near Shadings		No Shadings			
PV Array Characteristics					
PV module		SI-mono Model CSUN 240-60M			
		Manufacturer China Sunergy			
Number of PV modules		In series 22 modules		In parallel 182 strings	
Total number of PV modules		Nb. modules 4004		Unit Nom. Power 240 Wp	
Array global power		Nominal (STC) 961 kWp		At operating cond. 864 kWp (50°C)	
Array operating characteristics (50°C)		U mpp 596 V		I mpp 1450 A	
Total area		Module area 6501 m²			
Inverter					
		Model REFUsci 20K SCI			
		Manufacturer REFUsci GmbH			
Characteristics		Operating Voltage 490-800 V		Unit Nom. Power 20.0 kW AC	
Inverter pack		Number of Inverter 44 units		Total Power 880.0 kW AC	
PV Array loss factors					
Thermal Loss factor		Uc (const) 25.0 W/m²K		Uv (wind) 0.0 W/m²K / m/s	
=> Nominal Oper. Coll. Temp. (G=800 W/m², Tamb=20°C, Wind=1 m/s.)		NOCT 49 °C			
Wiring Ohmic Loss		Global array res. 3.0 mOhm		Loss Fraction 0.7 % at STC	
Module Quality Loss				Loss Fraction 1.0 %	
Module Mismatch Losses				Loss Fraction 1.0 % at MPP	
Incidence effect, ASHRAE parametrization		IAM = 1 - bo (1/cos i - 1)			
bo Parameter		0.02			
User's needs :		Unlimited load (grid)			

PV Syst Simulation – Page 2



100 KW PV Array Layout



3 D Model of Ballasted Rooftop Mounting Structure

