

**PROPOSAL FOR
DESIGN, SUPPLY, INSTALLATION, TESTING AND
COMMISSIONING OF 20 KWp GRID-TIED SOLAR ROOF TOP
POWER PLANT**

Submitted

To

DUPONT - Madurai

By



(AN ISO 9001-2015 & 14001-2015 CERTIFIED COMPANY)



GREENTEK INDIA PRIVATE LIMITED

Plot # 8, Lepakshi colony, West Marredpally, Secunderabad -500026

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Introduction, Vision & Mission of Greentek India Pvt Ltd

GIPL is an ISO 9001:2015 & 14001-2015 certified Company based at Hyderabad is one of the leading manufacturers of Solar Photo Voltaic Modules (SPV) in the Country. We are manufacturing modules in the range of 37W to 300W. Thus, our Module production line is geared to produce panels of any custom size or wattage having Certifications/Approvals from MNRE, IEC 61215, IEC 61701, IEC 61730.

GIPL is having strong presence in the field of Renewable Energy and provides complete turnkey solar EPC solutions. We have a team of highly skilled solar engineers to design and construct your solar project. GIPL offers Advisory Services, Engineering, Procurement & Construction (EPC) Services and Operation & Maintenance Services Solar Power Projects ranges KWp to MWp scale to domestic, industrial, commercial and government entities.

Incorporated in the year 2007 and expertise in all renewable energy systems. Joint ventured with many reputed companies throughout the India and having the best technical partners and supplier in their class throughout India.

To become one of the leading renewable energy equipments and turnkey solution provider. We always aim at one step ahead in the development of innovative and competitive solutions for the production and management of electrical power through Solar PV systems. Served & serving many esteemed organizations and individuals in India.

Solar Photovoltaic:

- * Grid connected or Utility scale Solar Power Projects.
- * Off-grid SPV Power Packs.
- * Rooftop Solar Power Projects (Standalone & Grid-tied).
- * Other Solar application

GIPL is a registered Solar PV Systems integrator in MNRE, NREDCAP & TNREDC.

GIPL tries not just to meet our customer's expectations; strive to exceed the customer's expectations. Every time, measure its success by its customer's trust and confidence in us. We always work with principle to provide up to date technology, the best quality equipment, error less workmanship and on time service to its clients.

Manufacturing Facility:

State of the art manufacturing facility at Shabhashpally(V), Shivampet(M), Medak(Dt) at a distance of 60 k.m from Hyderabad.

1. Solar PV modules
 - a. Polycrystalline
 - b. Monocrystalline
2. Solar Water Heaters
 - a. Flat Plate Collector (FPC)
 - b. Evacuated Tube Collector (ETC)

Corporate Office : Plot No. 8, Lepakshi Colony, West Marredpally, Secunderabad-26.

Manufacturing Unit : Sy No. 43/1A, Shabhashpally(V), Shivampet(M), Medak(Dt).

North Branch : F-382, Sector-63, Noida – 201 307, Uttar Pradesh

Pune Branch : Shed No. 5, Sy. No. 25/3/2, Raikar Building, Satyam Industrial Estate, NandedPhata, Pune – 411 041, Maharashtra.

EPC - Services:

- ❖ Megawatt scale ground mounted solar PV plants.
- ❖ Megawatt scale solar PV plants for third party sale.
- ❖ Megawatt scale solar PV plants for captive consumption.
- ❖ Large scale roof top solar PV plants for Hospitals, Hotels, Educational Institutions and other commercial buildings.
- ❖ Roof top Solar PV plants under net metering / Gross metering policies.
- ❖ Solar water heaters and Solar thermal projects.
- ❖ Solar powered LED street lights & Solar Fencing.

Benefits of using solar power:

1. Energy generation is for 25 years.
2. Payback period is 3-4 Years.
3. CFA Subsidy of 30% to the Hospitals, Educational Institutions, NGO's, Trusts and Societies those who are into non-profit making.
4. Accelerated depreciation for private / commercial / profit making organizations @ 40% in the first year and 20% in the second year.
5. Revenue from generation based renewable energy certificates.
6. Low maintenance cost.
7. Easy loan process from banks.
8. Free from power cuts.
9. Free from the DG expenses.
10. Quality power.

Executed projects by our team:

- i. 4 MW Solar Grid tied plant at Kalwakurthy, Mahaboobnagar (DT).**
- ii. 81.6 KW Solar Power Plant for Omega Hospital, Hyderabad.**
- iii. 75 KW Solar Grid Tied System for DE-SHAW Jubilee Hills, Hyderabad.**
- iv. 60 KW Solar PV System for Rajas Dental College- Nagarcoil. Tamilnadu**
- v. 30 KW for Stanley Engineered Fastners , Chennai. Tamilnadu**
- vi. 20 KW Solar Grid Tied system for CAL Public School, Hyderabad.**
- vii. 20 KW for MJ Hospital, Armoor, Nizamabad.**
- viii. 20 KW for Subbulakshmi Nursing Home, Tenkasi. Tamilnadu**
- ix. 15 KW for 4S systems, A.S.Rao Nagar, Hyderabad.**
- x. 14 KW for FHD Group Hyderabad.**
- xi. 14 KW for Directorate of Sorghum Research, Hyderabad.**
- xii. 12 KW for AKG Filling Station, IOCL, Sadasivpet.**
- xiii. 10 KW for Aravinda Schools, Kottayam, Kerala**
- xiv. 10 KW for S.S.Service Station, IOCL, Kallakal, Medak.**
- xv. 10 KW for MadhuVidyalayam, Wyr, Khammam.**
- xvi. 10 KW for Hotel Satya Inn, Ashok Nagar, BHEL, Hyderabad.**
- xvii. 10 KW Solar Grid Tied System for Dr. Reddys Foundation, Hyd.**
- xviii. 10 KW for Mr.Surendra Reddy, Champapet, Hyderabad.**
- xix. 10 KW for Mr. Srinivas Reddy, Champapet, Hyderabad.**
- xx. 10 KW for Pastoral Centre, Abids, Hyderabad.**
- xxi. 10 KW for Mr. Mukul Chand, Agra, Uttar Pradesh.**
- xxii. 6 KW for Dr Water Mineral Water Plant, Boduppal, Hyderabad.**
- xxiii. 6 KW for Mr. B.V.Bhadrappa, Champapet, Hyderabad**
- xxiv. 5 KW for Commissioner of Industries APIIC, Hyderabad.**
- xxv. 5 KW for Mahathma Gandhi University, Nalgonda, Hyderabad.**
- xxvi. 5 KW for Vrihat Solar Lucknow.**
- xxvii. 5 X 2 KW(2X5Hp Motors) for KommuriPrathap ReddyEngg. College.**
- xxviii. 5 KW for Mr.C.Shashidhar Reddy, Ashok Nagar, Hyderabad.**
- xxix. 5 KW for Mr. GovardhanHeda, Uppal, Hyderabad.**
- xxx. 5 KW for Mr. ArunSoundhi, Agra, Uttar Pradesh.**
- xxxi. 5 KW for Mr. Krishna Singh, Noida, Uttar Pradesh.**

Prestigious Clients:



DETAILS OF THE PROPOSED 20 KW_p ROOFTOP SOLAR PV POWER PLANT

Client	E.I.DuPont India Private Limited.
Location	MADURAI (DT)
Plant Size	20 KW_p
Latitude	9°54'
Longitude	78°07'
Elevation	462 Ft
Type of Installation	Rooftop
Solar Radiation	5.26 KW/ Hr / Sq. m
Technology	Poly Crystalline

Energy Generation:

Solar Power Plant Capacity	20 KW_p
Average Solar Energy Generated Per Day	90 KWh / UNITS
Average Solar Energy Generated Per Year	28,800 KW / UNITS
Area Required	1600 SFT
Space required for the control room	1 Sq.m

System configuration:

Equipment Description	Rating	Qty.
Solar Grid Tied UPS MPPT based	20 KVA	1
Polycrystalline PV panels	325	62
Mounting Structures	GI/MS Galvanized	62
AJB's/SCB's, Cables, ACDB, Transformers, L/A, Earthling & BOS etc.	As per MNRE Spec	

SCOPE OF WORK:

- a. Scope of work covers Supply of PV Modules, Inverter and Structure.
- b. Installation and Commissioning charges Extra for outstation sites.
- c. Taxes & Transportation Extra.
- d. Civil / Grouting work at customer's scope
- e. Mounting Structure is for flat RCC roofs/ leveled ground only.
- f. Prices quoted are firm and valid for a period of 15 days from the date of this offer
- g. We have quoted as per the information received. Any modification will require corresponding revision of rates.
- h. Any further taxes levied on this work by the government with the Amendment in the act effective, retrospectively will be charged extra.

Note: Additional cost will be charged for customized Structure depending up on the requirement of elevation. Technical calibrations considered for this offer are for budgetary purpose. During the execution final quantity may vary as per the actual site situation and final design.

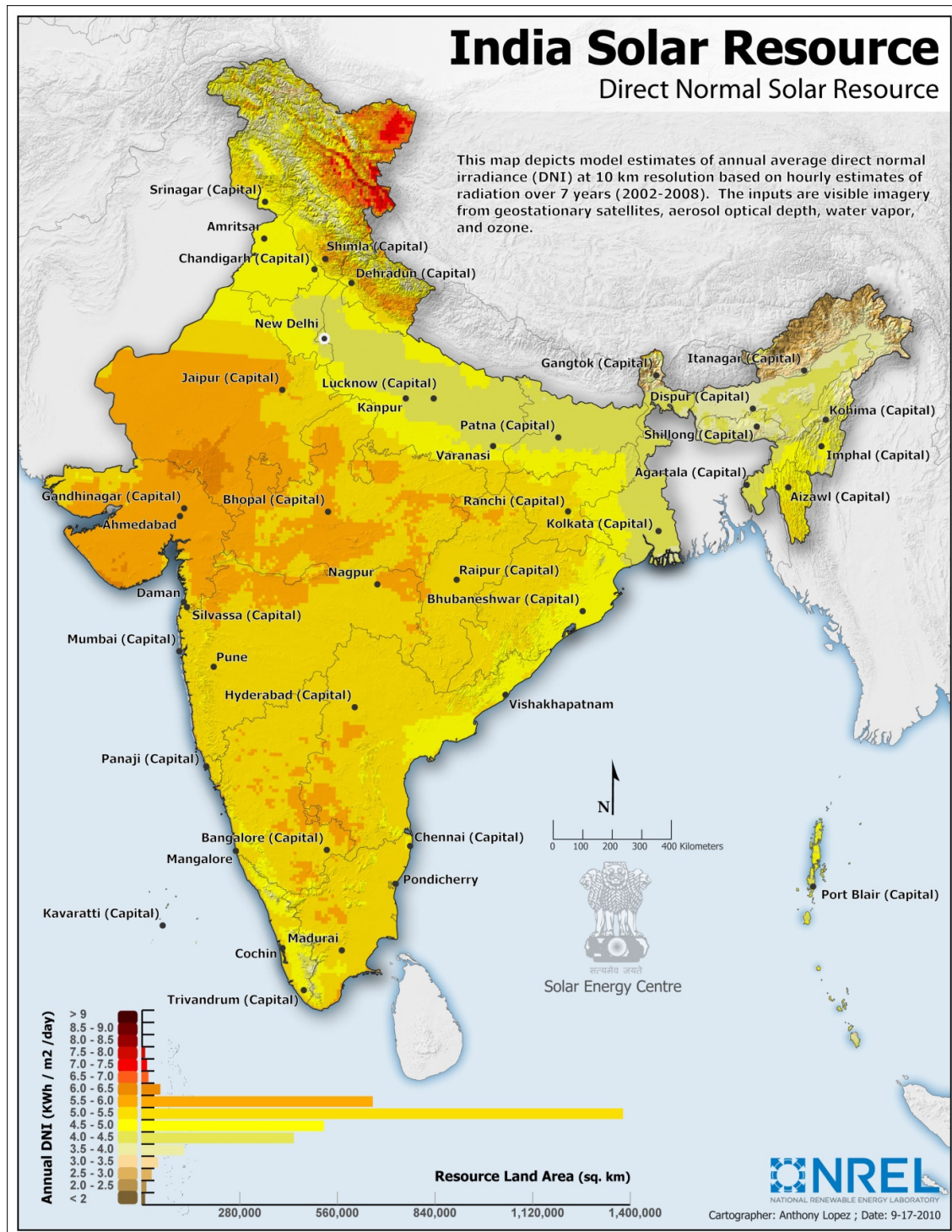
The beneficiary has to make his payment through Cheque/ Demand Draft/ RTGS only no cash payments will be accepted.

SATELLITE IMAGE OF PROPOSED SITE.

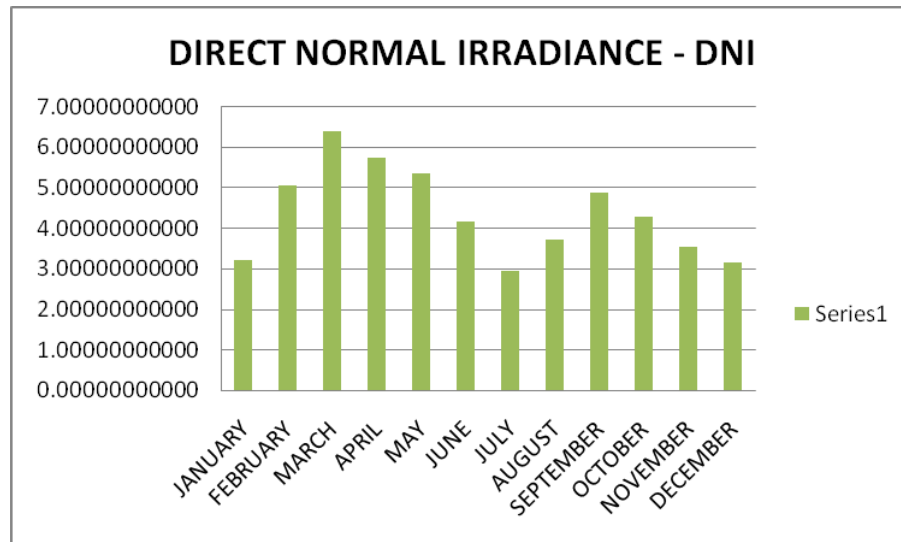
Physical parameters:

Latitude : 9°54'¹
Longitude : 78°07'¹
Elevation : 462 Ft

SOLAR INSOLATION AT PROPOSED SITE



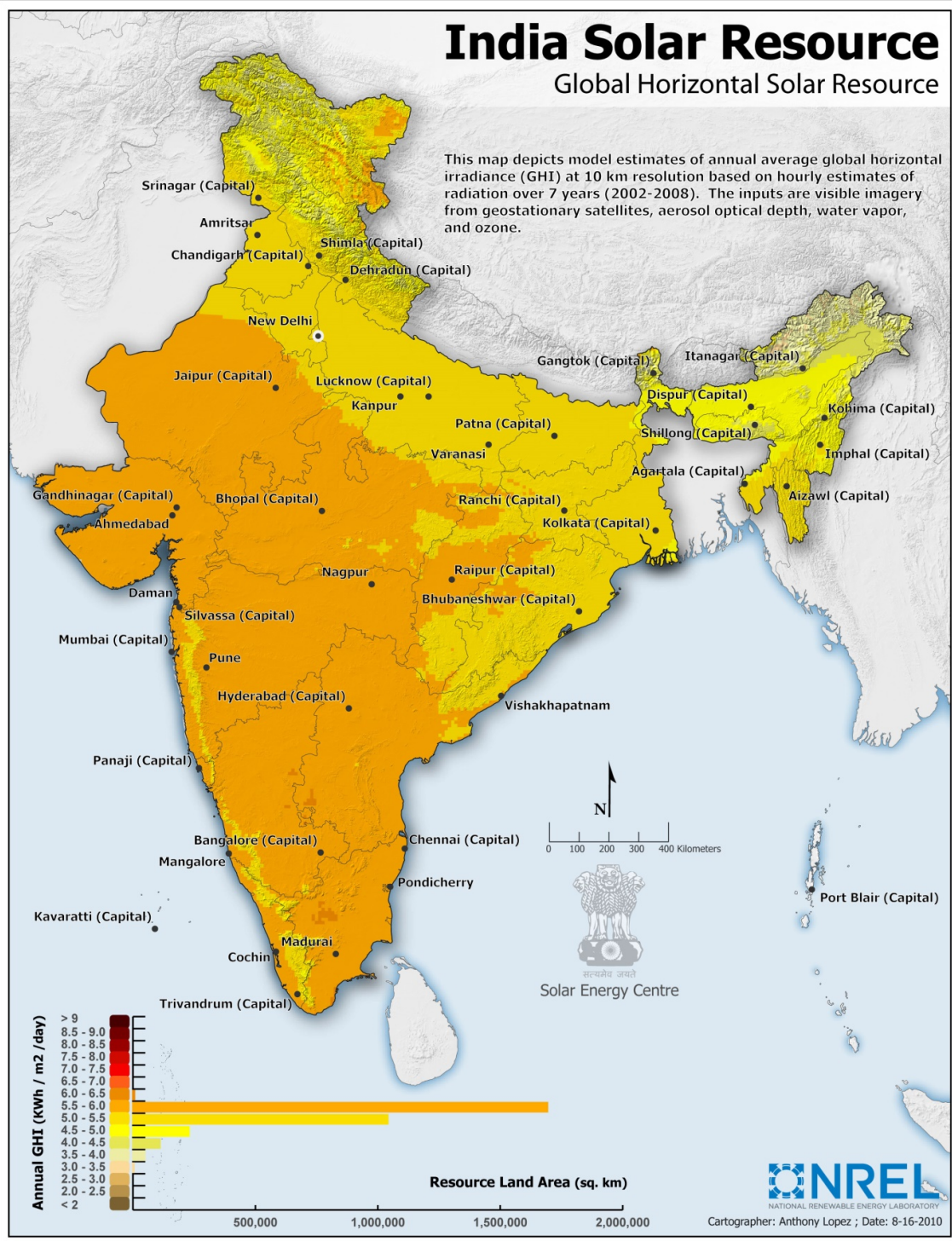
DNI	DIRECT NORMAL IRRADIANCE
LATTITUDE:	9°54¹
LONGITUDE:	78°07¹
ELEVATION:	462 Ft
CLIENT	E.I.DuPont India Private Limited.
MONTH	SOLAR INSOLATION KWh/Sq.M/DAY
JANUARY	3.22789990234
FEBRUARY	5.05600000000
MARCH	6.39170019531
APRIL	5.74810009766
MAY	5.35570019531
JUNE	4.16389990234
JULY	2.96310009766
AUGUST	3.71230004883
SEPTEMBER	4.89529980469
OCTOBER	4.27729980469
NOVEMBER	3.53030004883
DECEMBER	3.15530004883
ANNUAL DNI	4.36560009766



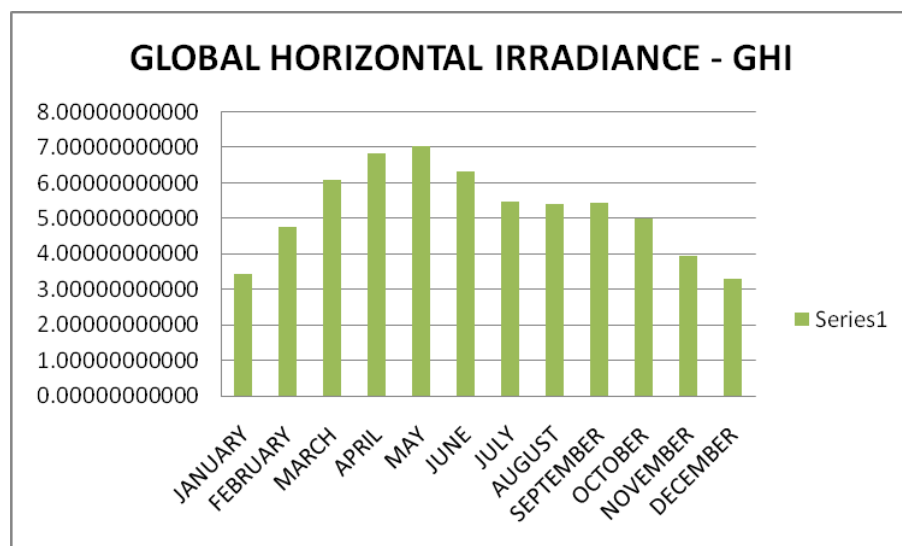
India Solar Resource

Global Horizontal Solar Resource

This map depicts model estimates of annual average global horizontal irradiance (GHI) at 10 km resolution based on hourly estimates of radiation over 7 years (2002-2008). The inputs are visible imagery from geostationary satellites, aerosol optical depth, water vapor, and ozone.



GHI	GLOBAL HORIZONTAL IRRADIANCE
LATTITUDE:	9°54'
LONGITUDE:	78°07'
ELEVATION:	462 Ft
CLIENT	E.I.DuPont India Private Limited.
MONTH	SOLAR INSOLATION KWh/Sq.M/DAY
JANUARY	3.43889990234
FEBRUARY	4.75610009766
MARCH	6.09129980469
APRIL	6.85839990234
MAY	7.03310009766
JUNE	6.34389990234
JULY	5.48470019531
AUGUST	5.41470019531
SEPTEMBER	5.45910009766
OCTOBER	5.00729980469
NOVEMBER	3.95760009766
DECEMBER	3.29189990234
ANNUAL GHI	5.26089990234



TECHNICAL DETAILS:

SOLAR PV PANELS:

Make	: GREENTEK
Model	: 325 Wp – 72 Cells
RFID	: Internal
Approvals	:MNRE, UL, IEC
Warranty	: 25 Years
Wattage	:325Wp
Voltage	: 46.6 V
Current	:8.85 A
Size	: 1961 X 991 X 40 mm
Weight	: 24 KG



CERTIFICATIONS:

IEC – 61215, 61730, 62716& UL CERTIFIED

MNRE APPROVED

Solar Grid – Tied Inverter:

Make	: Ploycab
Model	:50 KVA
MPP Range	:480-850 V
Operating Range	:200-950 V
Min DC Voltage	
/Starting Voltage	:200/250V
No-Load Voltage	:1000V
Maximum input Current	:3*36.0A
No of MPP Trackers	:4
Max Power /Tracker	:50KW
No of strings	:3*4
Rated Output	:49900 VA
Supply Voltage	:According to requirement
Rated Current	: 50 A
Rated Frequency	:50/60Hz
Cos Phi	:0.80 inductive,capacitive
No of Grid Phases	:3
Protection Class	:IP-65
Weight	:50 Kg

SAFETY/STANDARDS

Anti-islanding Protection / Grid Regulation	VDE-AR-N 4105; VDE 0126-1-1
EMC	EN 61000-6-2; EN 61000-6-4
Safety	IEC 62109-1/-2
Efficiency	IEC 61683:1999
Environmental Testing	IEC 60068-2-1; IEC 60068-2-2; IEC 60068-2-14; IEC 60068-2-30; IEC 60068-2-6; IEC 60068-2-21; IEC 60068-2-27; IEC 60068-2-75; IEC 60068-2-78 (As Per MNRE and SECI Requirement)
Ingress Protection	IEC 60529

Mounting Structure:

Protection:Galvanized

Longevity:Rust proof

Material:Mild steel

Warranty : 30 years



Cables:

Polycab

UV Resistant

Type 1 cable

ISO 9001:2008 and 14001:2004 certified

Flame Retardant Low Smoke

High temperature resistant (Up to 120 °C)



Tasks and Scope of work:

TASK DESCRIPTION	SCOPE	
PRE-CONTRACT STAGE		REMARKS
AGREEMENT	CLIENT&GREENTEK	
GATHER REQUIREMENTS	GREENTEK	
SITE SURVEY	GREENTEK	
PROJECT PROPOSAL	GREENTEK	
FEASIBILITY REPORT	DISCOM	
EXECUTION STAGE		
DESIGN – Civil, Electrical and Mechanical	GREENTEK	
SOURCE ALL COMPONENTS	GREENTEK	
CIVIL WORKS	GREENTEK	
MOUNTING STRUCTURE'S ERECTION	GREENTEK	
PV MODULE MOUNTING	GREENTEK	
DC WIRING FROM PV MODULES TO INVERTER & TERMINATION	GREENTEK	
AC WIRING FROM SOLAR INV. TO LOADS& TERMINATION	GREENTEK	
EARTHLING & LIGHTNING ARRESTORS	GREENTEK	
COMMISSIONING	GREENTEK	
POST-EXECUTION STAGE		
TRIAL RUN	GREENTEK	
INSPECTION	DISCOM	
GRID SYNCHRONISATION	DISCOM	
TRAINING CLIENT PERSONNEL	GG Enterprises	
SUBMISSION OF MANUALS & WARRANTIES	GG Enterprises	
HANDING OVER	GREENTEK & GG Enterprises	
OPERATIONS& MAINTENANCE	GG Enterprises	

Financials:

Cost of the project	INR. 12,32,000/-
Taxes (VAT-5%)	INR. 61,600/-
SECI SUBSIDY 30%	INR. 0/-
NET PAYABLE BY CUSTOMER	INR. 12,93,600/-
Transportation to Site	At actual
Cost of Grid Synchronization	At actual
Cost of Bi-Directional meter	At actual

(Rupees: Twelve lakhs thirty two thousand six hundred only)

Note:

1. Cost of Liasoning with DISCOM, MNRE for getting approvals and processing fee will be INR. 1,00,000/-.
2. Subsidy 30% applicable only to Educational Institutions, Hospitals, Residential and nonprofit making organizations (Trusts and Societies).
3. Total plant insurance – Customer scope.
4. AMC free for first 1 years.

Payment Terms:

Advance along with PO	30%
After getting DISCOM feasibility	
Before the dispatch of material	60%
Upon commissioning	10%

Warranty:

Solar PV module Performance warranty	25 years
Grid tied Inverter	5 years

Key Features of the Plant:

Expected Power Generation from 20 KW solar power plant per day	90 Units
Net Export to the Grid (Month)	2,700 Units
Net Generation Cost@Rs. 9 (Monthly)	INR 24,300-00
Peak Generation cost per year	INR 2,91,000-00

CASH FLOW – ANALYSIS FOR 20 KW SOLAR PV PLANT:

YEAR	GENERATED UNITS	TARIFF	SAVING	CUMULATIVE SAVINGS	Cum Int on Surplus	TOTAL SAVING
1	28800	9	259200	259200	0	259200
2	28512	9.45	269438.4	269438.4	10238.4	538876.8
3	28226.88	9.9225	280081.2168	280081.2168	20881.217	839839.234
4	27944.61	10.41863	291144.4249	291144.4249	31944.425	1162928.08
5	27665.17	10.93956	302644.6296	302644.6296	43444.63	1509017.34
6	27388.51	11.48653	314599.0925	314599.0925	55399.093	1879015.53
7	27114.63	12.06086	327025.7567	327025.7567	67825.757	2273867.04
8	26843.48	12.6639	339943.2741	339943.2741	80743.274	2694553.59
9	26575.05	13.2971	353371.0334	353371.0334	94171.033	3142095.66
10	26309.3	13.96195	367329.1892	367329.1892	108129.19	3617554.03
11	26046.2	14.66005	381838.6922	381838.6922	122638.69	4122031.42
12	25785.74	15.39305	396921.3205	396921.3205	137721.32	4656674.06
13	25527.88	16.16271	412599.7127	412599.7127	153399.71	5222673.49
14	25272.61	16.97084	428897.4013	428897.4013	169697.4	5821268.29
15	25019.88	17.81938	445838.8487	445838.8487	186638.85	6453745.99
16	24769.68	18.71035	463449.4832	463449.4832	204249.48	7121444.95
17	24521.98	19.64587	481755.7378	481755.7378	222555.74	7825756.43
18	24276.76	20.62816	500785.0894	500785.0894	241585.09	8568126.61
19	24034	21.65957	520566.1005	520566.1005	261366.1	9350058.81
20	23793.66	22.74255	541128.4614	541128.4614	281928.46	10173115.7
21	23555.72	23.87968	562503.0357	562503.0357	303303.04	11038921.8
22	23320.16	25.07366	584721.9056	584721.9056	325521.91	11949165.6
23	23086.96	26.32735	607818.4208	607818.4208	348618.42	12905602.5
24	22856.09	27.64371	631827.2485	631827.2485	372627.25	13910057

25	22627.53	29.0259	656784.4248	656784.4248	397584.42	1054368.85
					TOTAL SAVINGS	1054368.85

ROI (Return on investment)

TOTAL CUMULATIVE SAVING IN 25 YEARS

TARIFF

ESCALATION 5% per anum

DETORIATION 0.5% Per Year

INTEREST ON SAVINGS 7% Per Anum

Annual Maintenance Contract (AMC)

FREE FOR 1 YEARS

SCOPE OF WORK

We offer the following services as a part of solar plant annual maintenance contract:

- 1) Facility Management:** Maintenance and
Implementation of official requirements for technical operation,
- 2) Plant Monitoring:** Monthly analysis and evaluation of operational plant data
Remote monitoring
Plausibility test of current yield and weather data(If available)
Energy meter value management
Service Hot line from 8.00 hr-17.00 hr.
- 3) Preventive Maintenance:** Preventive inspection and maintenance of system according to
Manufacturer's specifications
Documentation of events and measures
Provision of small parts and operating material
Conduction of regulatory tests according to technical standards
- 4) Fault detection and analysis:** Function check after fault message is received
Immediate start of fault removal measurers
Long term trend analysis
- 5) Management of repairs:** Analysis of interruptions and incidents and claims
Supply chain management for spare parts i.e. modules, inverters,
Cabling and mechanical components
- 6) Documentation and Data management:**
Documentation of plant energy output and system availability
Electronic plant logbook
Detailed information about main events measures
Customer reports on a quarterly/yearly basis
- 7) Warranty and service management:**
Monitoring and tracking of warranty rights
Support with insurance cases
Coordination and managing of external (3rd party) service providers (If any)

AMC – COST AFTER 1 YEARS

OPTION - 1

AMC – Service without spares

AMC COST FOR 100 KW SOLAR POWER PLANT	INR. 45,000-00
SERVICE TAX @ 18%	INR. 8,100-00
NET PAYABLE	INR. 53,100-00
ESCALATION	5% P.A

OPTION – 2:

As the solar power plant is maintenance free, as and when there is a problem, our service team will attend within 24 hours to resolve the issue. We will be charging per visit INR. 5,000/- + Tax as service charge per visit. If any part replaced during service, it will be charged extra at actual.

With all the attributes of a reliable group, we take the opportunity to approach you for giving us the opportunity to serve you with quality and expertise.

Looking forward to receive your valuable order on which we will give our prompt attention for smooth execution.

S.SANDHOSH KUMAR

Regional Manager – Projects & Sales | South India

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