Techno-Commercial offer
For EPC of Solar Rooftop 7161 kWp Solar PV Power Plant

Project Name	6 MWp Rooftop Solar
Customer Name	Amber Enterprises India Limited
Supplier Name	Oriana Power Ltd.
Product/Solution	Rooftop Solar- SOLAR EPC
Offer reference /Rev.	OPL/RFP/23-24/396/(Rev. 0)
Offer date	15.10.2023

Introduction

To

Amber Enterprises India Limited
Gurgaon, Haryana

Subject: Techno-commercial offer for design, supply, Installation (EPC) of Rooftop 7161 KWp Solar Power Project in multiple Location.

Dear Sir,

Thank you very much for your interest in Green energy Initiatives and Solar Power solutions.

Oriana Power would like to introduce ourselves – We are a complete Renewable Energy /Solar EPC / Developer company based out in Delhi doing projects across India.

As on date we have completed more than 200MW + capacity solar projects supply and execution for ground based, industrial and commercial buildings in India. In addition to this, we have delivered 3MW+ capacity solar rooftop solutions for private clients in **Kenya**.

ORIANA POWER is a **MNRE approved channel partner** and an industry leader in **RESCO /OPEX/BOOT/ Group captive/ Open access /Energy Storage mode of SOLAR SOLUTION (SOLAR ROOFTOP/Ground Mounted-EPC/OPEX) for Industries, commercials and Institutions in India**. Through our in-house production facility for most of the components, ORIANA POWER has emerged as a leader with their best in the class products available in the market. Our products are developed as per the international standards applicable for all the products. We believe in optimization and innovation and the same is our prime focus. As on date we have delivered world class projects (more than 200MW Total Installed capacity).

ORIANA POWER has been serving the market since last one decade with highly qualified & experienced workforce.

ORIANA POWER has got wide solutions range for all categories of solar application existing in the market i.e. Ground mount/ RCC Roof/ Industrial Roof/ Car Parking/ Custom solutions.

With gratitude we would like to name some of our key clients – JK Group (JK Foods) , JK Lakshmi Cement , Hindustan Salt Limited, Mantora Oils refinery , DOE Delhi, REIL Rajasthan, Sledgehammer Oil Tools Pvt Ltd Faridabad , MDPS Faridabad, GVMC Visakhapattam, Omkar Agro Nagpur, Lupin Pharma Goa, Crompton Greaves Goa, Saint Gobain Bhiwadi, Shah infra Towers Karnatka , Ircon International Gurugram, Insta Products Kenya, Adpack Kenya , Cremica Biscuits, Uneecops Technologies, KIIT Orisha, CREST Chandigarh, PEDA Punjab, NISE-MNRE, C&S Electric, AZURE, ACME, RENEW POWER, JAKSON, SANKALP, HERO FUTURISTIC ENERGIES, SUNSOURCE and many more..

Please find enclosed our techno-commercial offer for quotation for supply of **7.16 MWp design, supply, erection & commissioning of Rooftop Mounted Grid Tie Solar PV plant**. The offer consists of detailed technical specifications of our product/services as well as a price overview.

We look forward to your response and are at your full disposal if you require any further information.

Harshit Pundir,
Manager- BD
+91-8802578929

Award and Recognition

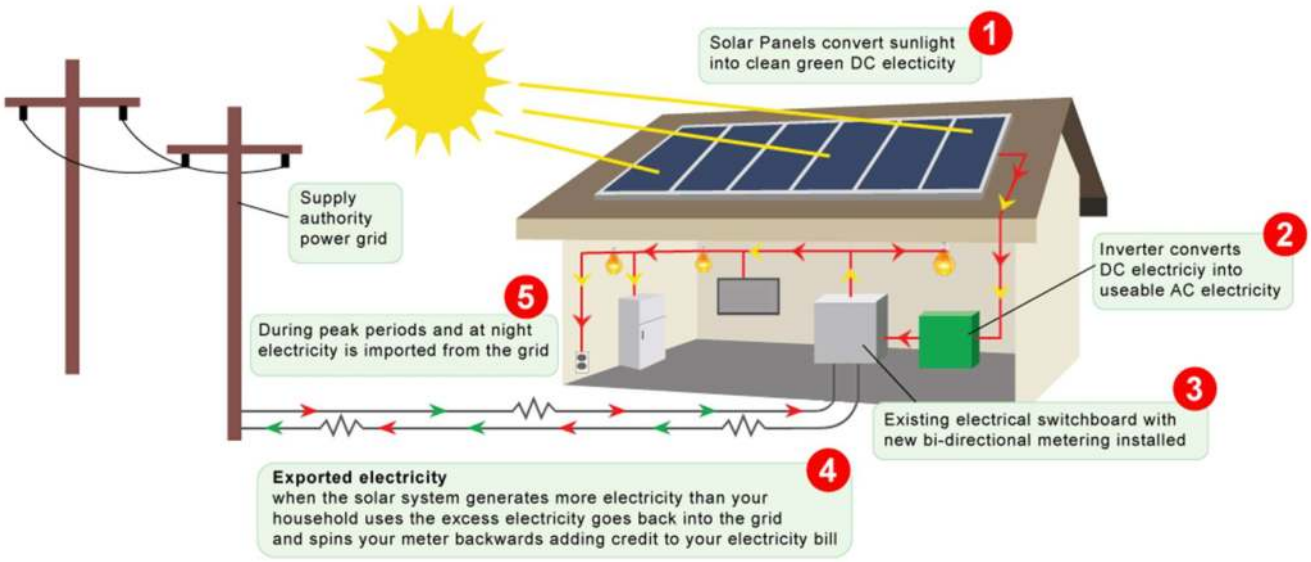
1. Solar Energy Introduction

Solar energy is radiant light and heat from the Sun that is harnessed using a range of ever-evolving technologies such as solar heating, photovoltaics, solar thermal energy, solar architecture, molten salt power plants and artificial photosynthesis.

It is an important source of renewable energy and its technologies are broadly characterized as either passive solar or active solar depending on how they capture and distribute solar energy or convert it into solar power. Active solar techniques include the use of photovoltaic systems, concentrated solar power and solar water heating to harness the energy. Passive solar techniques include orienting a building to the Sun, selecting materials with favorable thermal mass or light-dispersing properties, and designing spaces that naturally circulate air.

A photovoltaic system, also PV system or solar power system, is a power system designed to supply usable solar power by means of photovoltaics. It consists of an arrangement of several components, including solar panels to absorb and convert sunlight into electricity, a solar inverter to change the electric current from DC to AC, as well as mounting, cabling, and other electrical accessories to set up a working system. It may also use a solar tracking system to improve the system's overall performance and include an integrated battery solution, as prices for storage devices are expected to decline. Strictly speaking, a solar array only encompasses the ensemble of solar panels, the visible part of the PV system, and does not include all the other hardware, often summarized as balance of system (BOS). Moreover, PV systems convert light directly into electricity and shouldn't be confused with other technologies, such as concentrated solar power or solar thermal, used for heating and cooling.

PV systems range from small, rooftop-mounted or building-integrated systems with capacities from a few to several tens of kilowatts, to large utility-scale power stations of hundreds of megawatts. Nowadays, most PV systems are grid-connected, while off-grid or stand-alone systems only account for a small portion of the market.



Operating silently and without any moving parts or environmental emissions, PV systems have developed from being niche market applications into a mature technology used for mainstream electricity generation. A rooftop system recoups the invested energy for its manufacturing and installation within 0.7 to 2 years and produces about 95 percent of net clean renewable energy over a 25-year service lifetime

2. Solar PV Modules

Photovoltaic solar panels absorb sunlight as a source of energy to generate electricity. A photovoltaic (PV) module is a packaged, connected assembly of typically 6x12 photovoltaic solar cells. Photovoltaic modules constitute the photovoltaic array of a photovoltaic system that generates and supplies solar electricity in commercial and residential applications.

Each module is rated by its DC output power under standard test conditions (STC), and typically ranges from 100 to 350 Watts (W). The efficiency of a module determines the area of a module given the same rated output – an 8% efficient 230 W module will have twice the area of a 16% efficient 230 W module. There are a few commercially available solar modules that exceed efficiency of 20%.

A single solar module can produce only a limited amount of power; most installations contain multiple modules.

Mechanical & General

Dimensions

Given in inches and/or millimeters, a module's size determines how many can fit in a given space, whether on a roof or on a ground- or pole-mount. If rack information is also known, the number of rows and each row length can be determined, based on the space intermodule clips add between modules (typically 1/2- to 1-inch per gap). Many manufacturers will also diagram the appropriate rail positioning for their modules, such as how much of the module can overhang the rails, and whether rails can cross the module in a landscape or portrait orientation or both.

Area

Simply width times length, the area of a module is useful for checking power density. The total module area can be used along with site-specific data to calculate wind uplift forces and thus lag bolt requirements, or to calculate weight loading on a structure.

Thickness

The frame thickness determines what rack components to use, like slip-in racks, or the required size of end and intermodule clips. Typically, thicker frames result in sturdier, although heavier, modules.

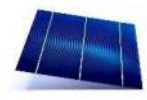
Weight

Most permitting authorities will ask for basic structural engineering data for roof-mounted PV arrays, and there will be a limit to the weight that can be added to a roof structure. Module weight, rack weight, and engineering data will restrict the quantity of PV modules that can be installed. Crystalline, glazed modules with plastic backsheets typically weigh about 10 kg per square meter.

Cells

Cells will be either monocrystalline, polycrystalline, ribbon silicon, thin-film, or even multiple silicon layers, such as with Panasonic's HIT module. Electrical characteristics, efficiencies, and appearance vary by cell type.

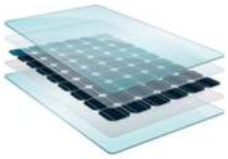
Modules can have variable numbers of cells (usually between 36 and 108), with each crystalline cell operating at around 0.5 VDC, wired in series or series-parallel configurations. For example, a 72-cell module with all cells in series will operate at a voltage of about 36 volts. But a 72-cell module with two series strings of 36 cells paralleled will operate at about 18 V, perfect for charging a 12 V battery.



Cell Dimensions

While all crystalline PV cells operate near 0.5 volts per cell, the diameter of the cell (normally 5 or 6 inches) will partially determine the current output of the cell, with larger cells producing higher current.

Glazing



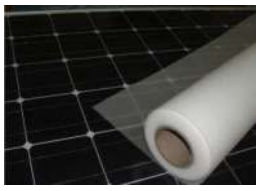
Most crystalline modules use low-iron, high-transparency tempered glass with an antireflection surface treatment. Low-iron glass has high clarity, and tempered glass shatters into small fragments, instead of sharp shards, if broken. Modules are strenuously tested for weight loading and impact resistance, and the front glazing of a module is extremely durable. Thin-film modules may use a polymer film (plastic) as the front sheet, which is designed for arrays in high-impact environments.

Backsheet

Most crystalline modules have a plastic backing material that seals the cells against environmental infiltration. The most common material is Tedlar, a polyvinyl fluoride film. This backsheet is the fragile underbelly of the module, and care must be taken not to scratch it.

Some crystalline modules have a glass backing (such as bifacial modules that can also utilize light reflected to the back side). Thin-film modules have a wider range of backings, including glass, stainless steel, and varieties of tough plastic polymers.

Encapsulation



A glue laminate, such as ethylene vinyl acetate, is used to seal and protect the back and front of cells within the module glazing and backsheet.

Frame

Some crystalline modules are frameless, with a glass front and back, similar to the technique used for many thin-film modules. But most crystalline modules have anodized aluminum frames, with clear-coated aluminum and silver gray being the most commonly available colors. Noting the frame information can help with other decisions, for example making sure that the color of the frame matches rack and clips, and to help blend with the roof color.

3. Solar Inverters

A solar inverter or PV inverter, is a type of electrical converter which converts the variable direct current (DC) output of a photovoltaic (PV) solar panel into a utility frequency alternating current (AC) that can be fed into a commercial electrical grid or used by a local. It is a critical balance of system (BOS)–component in a photovoltaic system, allowing the use of ordinary AC-powered equipment. Solar power inverters have special functions adapted for use with photovoltaic arrays, including maximum power point tracking and anti-islanding protection.

Solar grid-tie inverters are designed to quickly disconnect from the grid if the utility grid goes down. This is an NEC requirement that ensures that in the event of a blackout, the grid tie inverter will shut down to prevent the energy it produces from harming any line workers who are sent to fix the power grid.

Grid-tie inverters that are available on the market today use a number of different technologies. The inverters may use the newer high-frequency transformers, conventional low-frequency transformers, or no transformer. Instead of converting direct current directly to 120 or 240 volts AC, high-frequency transformers employ a computerized multi-step process that involves converting the power to high-frequency AC and then back to DC and then to the final AC output voltage.

Historically, there have been concerns about having transformer-less electrical systems feed into the public utility grid. The concerns stem from the fact that there is a lack of galvanic isolation between the DC and AC circuits, which could allow the passage of dangerous DC faults to the AC side. Since 2005, the NFPA's NEC allows transformer-less (or non-galvanically) inverters. The VDE 0126-1-1 and IEC 6210 also have been amended to allow and define the safety mechanisms needed for such systems. Primarily, residual or ground current detection is used to detect possible fault conditions. Also isolation tests are performed to ensure DC to AC separation.

Many solar inverters are designed to be connected to a utility grid, and will not operate when they do not detect the presence of the grid. They contain special circuitry to precisely match the voltage, frequency and phase of the grid.

4. Balance of System

The balance of system (BOS) encompasses all components of a photovoltaic system other than the photovoltaic panels and Solar Inverter. This includes wiring, switches, a mounting system, ACCB, Meters, Earthing etc.

Other optional components include, renewable energy credit revenue-grade meter, Energy management software, solar irradiance sensors, or task-specific accessories designed to meet specialized requirements for a system owner.

Major BOS components are described here:

Module Mounting Structure

The solar array of a PV system can be mounted on rooftops, generally with a few inches gap and parallel to the surface of the roof. If the rooftop is horizontal, the array is mounted with each panel aligned at an angle. If the panels are planned to be mounted before the construction of the roof, the roof can be designed accordingly by installing support brackets for the panels before the materials for the roof are installed. The installation of the solar panels can be undertaken by the crew responsible for installing the roof. If the roof is already constructed, it is relatively easy to retrofit panels directly on top of existing roofing structures. For a small minority of roofs (often not built to code) that are designed so that it is capable of bearing only the weight of the roof, installing solar panels demands that the roof structure must be strengthened before-hand. In all cases of retrofits particular consideration to weather sealing is necessary There are many low-weight designs for PV systems that can be used on either sloped or flat roofs (e.g. plastic wedges or the PV-pod), most however, rely on a type of extruded aluminum rails. In some cases, converting to composition shingles, the weight of the removed roof materials can compensate the additional weight of the panels

structure. The general practice for installation of roof-mounted solar panels include having a support bracket per hundred watts of panels.

LT Panels

The combiner box's role is to bring the output of several solar strings together. Solar combiner boxes also consolidate incoming power into one main feed that distributes to a solar inverter. This saves labor and material costs through wire reductions. Solar combiner boxes are engineered to provide overcurrent and overvoltage protection to enhance inverter protection and reliability.

If a project only has two or three strings, like a typical home, a combiner box isn't required. Rather, you'll attach the string directly to an inverter. It is only for larger projects, anywhere from four to 4,000 strings that combiner boxes become necessary. However, combiner boxes can have advantages in projects of all sizes. In residential applications, combiner boxes can bring a small number of strings to a central location for easy installation, disconnect and maintenance. In commercial applications, differently sized combiner boxes are often used to capture power from unorthodox layouts of varying building types. For utility-scale projects, combiner boxes allow site designers to maximize power and reduce material and labor costs by distributing the combined connections.

Solar Cable

A solar cable is the interconnection cable used in photovoltaic power generation. Solar cables interconnect solar panels and other electrical components of a photovoltaic system. Solar cables are designed to be UV resistant and weather resistant. They can be used within a large temperature range and are generally laid outside.

One common factor for most of the photovoltaic power systems is outdoor use, characterized by high temperatures and high UV radiation. Single-core cables with a maximum permissible DC voltage of 1.8 kV Umax. The phase to ground DC voltage rating must be Uo1.5kVDC and a temperature range from -40 °C to +90 °C ambient, 120 °C on the conductor for 25 year service life against thermal ageing. Ambient temperature and conductor temperature is derived from the Arrhenius law for ageing of polymers - ageing of polymers doubles for every 10 °C rise. DC string cables must be class II double insulated to protect against short circuits and ground faults

AC Cables

Cross-linked polyethylene, commonly abbreviated XLPE, is a form of polyethylene with cross-links. It is used predominantly in solar outdoor applications, outdoor heating and cooling systems, and insulation for high tension (high voltage) electrical cables. It's outdoor armored surface provide mechanical strength to cable.

Earthing and Protection

A major cause of catastrophic failures in PV systems is lightning and the related static discharge of electricity. The lightning strike does not have to be to the solar panel directly in order to damage equipment like inverters, string boxes or other electronic controls. The strike can actually occur miles away and be completely invisible to the area where the surge produces the damage, doing so by inducing voltage surges throughout wiring, even in very long lines. There are two crucial elements involved in the protection of PV systems from the damages of lightning surges: proper grounding and the installation of surge protective devices. Without proper grounding and protection, damage can be sustained at nearly any point in the equipment chain from the photovoltaic panel onward.

5. Bill of Material for Solar Plant

Sl. No.		Item Description	Quantity	Unit	Make	Comments
	PV SECTION					
A	1	**Solar PV module** **Model:** Mono PERC **Half cut cell:** (144 cells/Module) **Module Efficiency:** ≥21% **Maximum Power-P_{Max}:** ≥540 Wp **IP:** 68	7161	kWp	a. Trina Solar b. Longi c. Renew sys d. Adani solar **e.** similar	
	2	**String Solar Inverter** **Output Voltage:** xxV **Outdoor Type - IP:** 66 **Output Power:** 295 kVA @ 50°C **Inverter Efficiency:** ≥98% **Protection:** • Over Voltage, • Under Voltage, • Frequency, • DC reverse Polarity, • Anti-islanding	6000	kW	a. SunGrow b. Growatt c. similar	
	3	Connectors MC4 / **Y** Pair (Male + Female), 1800V max connectors IP: 68	1	Lot	a. Bizlink b. Staubli	
	STRUCTURES					
B	1	**Module Mounting Structures** **Type of Module Mounting:** Rooftop - Tinshed **Material:** Aluminium **Fasteners:** SS304 (With Plain & Serrated Washer) **Fixed Tilt:** As per tinshed **Wind Load:** 120 kmph **Minimum Distance between Module Frame & Shed:** 50mm	7161	kWp	Reputed	
	REMOTE MONITORING SYSTEM & ACCESSORIES (SCADA WITH WMS)					
C	1	Global Tilt Irradiance Sensor (GTI)	1	No's	Suryalogix/equivalent	
	2	Module Temperature Sensor	1	No's	Suryalogix/equivalent	
	3	Ambient Temperature Sensor	1	No's	Suryalogix/equivalent	
	4	RS485 Communication Cable	1	Lot	Parashield/Equivalent	
	5	CAT 6 Cable	1	Lot	D-Link/Equivalent	
	6	Data Logger with Battery Back-up	1	Set	Suryalogix	
	7	Sensor Mounting System/Junction Box	1	Set	reputed	
	8	HDPE DWC Conduit, Size: 32/26mm & Accessories (Bends, Couplers etc.)	1	Lot	Tirupati / Duralline/ Equivalent	
	LT PANEL					
D	1	Field ACDB with following - I/C - (1 no XXX Amp breaker, and individual breaker for each inverter input) - Mounting stand with locking arrangement & shading from rainwater. - IP 65 indoor Enclosure CRC Powder Coated - SPD Type 2 surge Arrester , All Input and Output lugs	1	Nos.	Breaker make a. L&T b. Schneider c. Siemens d. Reputed	3 phase, 415 V, 50 Hz ACCB Panel with - Enclosure material made of CRCA with Powder coated paint - Suitable MCB's at Input & Output - 3 phase, 4 W, bus bar. - IP 65 with canopy - Panel with double door & lock - SPD Type 2

						- with class 0.5 MFM energy meters
	DC SIDE CABLES & ACCESSORIES					
G	**1**	1 Core 4 / 6 Sq.mm. (UV protected double sheathed XLPO) 1 Core , xx Sqmm solar cable (module to inverter)	1 Lot	Meter	a. Siechem b. Apar c. KEI d. Similar	
	2	1 Core 2.5 Sq.mm. Green Cable, 1.1 KV Grade (Flexible PVC Insulated Cable)	1 Lot	Meter	a. Polycab b. KEI c. RR d. Havells e. Similar	
	3	DC Electrical Accessories (Ferrules, Cable Ties, uPVC Tape, etc.)	1 Lot	Lot	Reputed	
	4	HDPE DWC Conduit, Size: 32/26mm & Accessories (Bends & Couplers etc.)	1 Lot	Meter	Tirupati & Similar	
	AC SIDE CABLES & ACCESSORIES					
H	**1**	3.5 C X xx Sq.mm alu. XLPE armoured for -- Inverter to ACDB 3.1 KV Insulation, Class: 2, Extruded sheathed Cable. Extruded FRLS Outer sheath (UV Protected) Size: xxx sqmm	1 Lot	Meter	a. Polycab b. KEI c. Universal Similar	
	2	3.5 C X xxSq.mm Al. XLPE Galvanized Steel Strip/Round Wire Armoured – ACDB to client feeder Extruded Inner sheath Extruded FRLS Outer sheath (UV Protected) Size: xxxsqmm	1 Lot	Meter	a. Polycab b. KEI c. Universal Similar	
	3	AC Electrical Accessories Consumables like: • Canopy • Lugs • Glands, • Ferrules, • Cable Ties, • uPVC Tape, • uPVC Saddle, • Cable Clips etc.	1 Lot		Agreed make	
	CIVIL WORKS					
I	**1**	Foundation for Mounting Structure	1	Lot		
	2	Inverter Mounting Structure	1	Lot		
	3	Electrical Panel Foundation	1	Lot		
	SAFETY & PROTECTIONS					
J	**1**	Fire Extinguisher with sand bucket (4 Kg)	1	Lot	As per standard	
	2	DC & AC Earthing: Chemical Earthing-Earth Pits (3 Mtrs Cu. Bonded rod) & Module Earthing Carbon Based Ground Enhancing Material	1	Lot	Allied Power (LPI) / SGI	
	3	GI Strip for LT Earthing HDG min. 80 micron	1	Lot	Reputed	
	4	Earthing Wire	1	Lot	a. Polycab b. KEI	
	5	Lighting Arrester with Earthing-ESE type	1	Lot	Allied Power (LPI)	

	6	Safety & Danger Boards, Tags	1	Lot	Agreed standard	
	7	Walkway & lifeline	1	Lot	Reputed	
	MISCELLANEOUS					
K	1	Manual Module Cleaning System UPVC/HDPE Pipe, Valves and flexible hose pipe	1 Lot	No's	Apollo make	
	2	0.5 HP, 230V/415 AC Pump	1 Lot	No's	Kirloskar/Similar	
	Services					
L	1	Installation & Commissioning	1 Lot	No's	Oriana	

6. EPC SCOPE OF WORK

Serial	*Description of item*	*Scope of EPC*
1	Module Mounting Structure	✔
2	PV Modules	✔
3	Inverter	✔
4	ACDB	✔
6	Remote monitoring system/ SCADA	✔
7	DC Cable 4sqmm	✔
8	AC Cable	✔
9	Communication Cable	✔
10	Lighting arrestor (LA ESE type)	✔
11	Earthing for AC/DC System	✔
13	MC4 Connectors	✔
14	Fire extinguisher & Sand buckets	✔
15	Cable tray for AC cable	✔
16	Conduit HDPE pipes for cables (string,comm.)	✔
17	Cable tie	✔
19	Safety instruction boards	✔
20	Module Cleaning system	✔
21	Land Levelling & Cleaning of Bushes	Client scope
22	CEIG approval (statutory Charges shall be in client scope)	✔
23	Net Metering (statutory charges and metering charges in client scope)	✔

7. Client's Scope of work

1) Provision of permission to work on site for I&C. 24x7 – 7 days a week.
2) Access to the Roof shall be in client scope.
3) Provision of Internet connection using SIM cards/Lan for remote monitoring of Solar Power Plant.
4) Levelled and cleared land shall be provided for installation of solar power plant.
5) Secure area for keeping tools and tackles.
6) Construction power and water has to be provided by client.
7) Statutory fees (direct or indirect cost) required for any approval/ permissions pertaining to power evacuation from solar plant shall be in client's scope however liasioning will be done by Oriana Power limited.

8. Commercial Terms - Capex

S. No.	Description	Capacity	Price
1.1	***7161 kWp Rooftop capacity solar power plant Design, Supply, Installation, Testing & Commissioning with*** • ***Monocrystalline pv panels*** • ***String inverter***	**6000 KWp**	**Project Value:** **INR 37,16,65,590/-** **@ INR 51.90 Rs per Wp** **Including GST and 5 Years O&M**

Notes:

- Freight & Transit Insurance: Inclusive.
- Statutory fees (direct or indirect cost) required for any approval/ permissions pertaining to power evacuation from solar plant shall be in client's scope however liasioning will be done by Oriana Power limited.
- **GST Extra – as per government norms**
- Any change in Tax/ Duties shall be borne by the Purchaser. During order finalization and order project execution any duty being applied by government shall be charged to client.
- We have ESI & EPF for our employees / project team, to cover 3rd party subcontractor we have EAR Policy to cover subcontractor manpower and daily wages manpower also.

Offer Validity

Our offer will remain valid for your acceptance up to 15 days, and thereafter subject to our confirmation.

Delivery Schedule

5-6 months from the date of issuance of clear purchase order and advance payment.

Payment Terms

- 30% advance along with EPC order
- 10% against Team mobilization at site
- 20% against structure dispatch proof /PI
- 10% balance BOS material dispatch /PI
- 20% against PV module / Inverters readiness at supplier end, before dispatch
- 5% after installation of MMS/ Solar panel and DC work
- 5% after charging and handover of project

9. General Terms & Conditions

1. Quotations made is strictly non-binding
2. The contract is only considered to be concluded when Oriana/Supplier has issued a written order confirmation after the receipt of order and this has been received by the purchaser, or a delivery has been dispatched.
3. All payments must be made within seven (7) days from date of invoice / PI issued by the contract, by bank transfer to the account indicated on the invoice from the same. In case of delay in payment more than seven days – Due payment shall be charged with interest @ 2% month.
4. Changes and additions, if any to scope of work or to this agreement have to be done in a written form and must clearly be marked as those. The above price is on deliverables as defined in the scope of work above.
5. Any change in factory infrastructure and relocation of solar plant, shall be charged and paid by client
6. Any maintenance related solar power plant equipment shall be done by Oriana power, any maintenance/replacement related to factory machinery, equipment's, transformer, cables, and DGs etc. shall be done by client.
7. Oriana maintenance scope of solar plant shall be considered without land.
8. Standard force majeure clause applies.

10. Performance Guarantees

1. Oriana guarantees the Performance Ratio (PR) i.e. 75% (Annual Average)

S.No.	Parameters	Specific Expected Generation (kWh/kWp/yr)	Total Annual Expected Generation (kWh/yr)	Guaranteed generation (kWh/KW/Yr)
1	Plant Capacity: 7161 kWp Orientation : South Shadow Free Timing: 9:30AM to 3:30PM	1350 kWh	1,18,26,000 kWh	85% of Expected Generation (i.e. 1,39,12,941 kWh

Note: expected generation is subject to proper module cleaning and 100% up-time of plant and grid both.
Oriana guarantees the Performance Ratio (PR) i.e. 75% (Annual Average) and above solar generation linked to the Global Horizontal solar radiation of 1900 KWh/m2/year.

Annual guaranteed generation shall have deration in between 0.5% to 0.8%, 2 % degradation in 1st year.

Exclusions from performance guarantees

Energy losses due to following events will not be considered to be covered by the performance guarantee. Any losses which can be attributed to these events will be treated as if the corresponding energy would have been generated by the system:

- Losses due to shut-downs caused by the contractor or third independent parties not controlled by Oriana or our subcontractors (e.g. during site visits, etc.)
- Losses due to plant/component malfunctions caused by improper operation of the plant/units/ components by the contractor or third independent parties not controlled by Oriana or our subcontractors.
- Losses due to failures of components which were not delivered by Oriana or our subcontractors.
- Losses due to inverter shut-downs because of grid outages
- Losses due to poor grid quality (grid quality out of the specifications of the inverter manufacturer).
- Losses due to lightning strikes, overvoltage, storms, floods, etc. or any other force majeure.
- Losses due to vandalism or theft.
- Losses due to excessive module soiling (in case of ground mounted system) (e.g. intensive agricultural work inside or outside the PV plant) which is out of control of Oriana or our subcontractors.
- Losses due to modifications at the site or its surroundings which are out of our control (i.e. shading due to new installations on the site or next to the site, etc.).
- Losses due to delayed reactions caused by outages of telecommunication networks.
- Losses due to poor/low solar radiation in that year than mentioned above.
- Losses due to delayed or not carried out repair or maintenance work which are under the obligation of the PV plant owner
- Losses due to changes caused by modified grid connection and/or feed-in conditions by the grid owner or the government.

11. Warranty

All equipment supplied by us shall carry original equipment warranty / guarantee terms. The back to back warranties / Guarantee provided for components and workmanships are as highlighted below:

- 25 years of performance warranty for Solar Modules.
- 5 years warranty for Solar Inverters.
- 1 Years for Balance of system.

Warranty does not cover

1. Damage, deterioration or malfunction resulting from accident, misuse, neglect, fire, water, lightning, or other acts of nature, unauthorized product modification, or failure to follow instructions supplied with the product.
2. Repair or attempted repair by anyone not authorized by producer.
3. Causes external to the product, such as electric power fluctuations or failure or insufficient ventilation.
4. Freight costs.
5. Removal, installation, and set-up service charges.
6. There are no warranties, express or implied, which extend beyond the description contained herein including the implied warranty of merchantability and fitness for particular purpose. Oriana's liability is limited to the cost of repair or replacement of the product. Oriana shall not be liable for:
   - 6.1. Damage to other property caused by any defects in the product, damages based upon inconvenience, loss of use of the product, loss of time, loss of profits, loss of business opportunity, loss of goodwill, interference with business relationships, or other commercial loss, even if advised of the possibility of such damages.
   - 6.2. Any other damages, whether incidental, consequential or otherwise.

6.3. Any claim against the customer by any other party.

PROJECT REFERENCE LIST

Project Name	Capacity	Location	Developer	COD
Solar Park in Rajasthan -50MW	50MW	Bikaner	Captive	By Oct 2023
Solar Park in UP -50MW	50MW	Lalitpur	RESCO-Self	By Dec 2023
JK Laxmi Cement-3 Sirohi	7MW	Sirohi RJ	RESCO-Self	By June 2023
Prashar Bharti (Under Construction)	14MW	Delhi	RESCO-Self	by Jun 2023
JK Laxmi Cement-2	8MW	Rajasthan	RESCO-Self	Nov 2022
GVMC 3MW (Floating solar)	3 MW	Visakhapatnam	EPC_Renew Power	Dec-21
JK Laxmi Cement-1	4.35MW	Udaipur	RESCO-Self	Nov-21
SaintGobain	4.1MW	Bhiwadi	EPC-Renew Power	May-20
Premier solar Kenya	3MW	Kenya	EPC-Premier Solar	Aug-19
Delhi Schools (DOE)	4.7MW	Delhi	RESCO-Self	Nov-20
Water works-Chandigarh (CREST)	2.35MW	Chandigarh	EPC-RGS Solar	Mar-18
Hindustan Copper Limited	1MW	Khetri, RJ	RESCO-Self	Sep 2022
HPCL	1.3MW	Banglore, KR	EPC- Hindustan Petroleum	Dec 2022
SECI- Multiple sites	2MW	Delhi	EPC-(Fourth Partner / Mplus	Jul-19
Elgris Solar	2MW	Silvasasa/Solapur/ Surat	EPC_Elgris Solar	Jul-21
KIIT /Gita/Gift University	1.5MW	Bhuvaneswar	EPC-Renew Power	Jun-19
Sector 26 - Chandigargh Crest	1MW	Chandigarh	EPC-CREST	Aug-17
Adani Solar (multiple sites)	1MW	Goa/ Nagpur	EPC-Adani Solar	2019-2020
REIL- ESIC, EPFO, AIR	1.5MW	Delhi, HR, UP	RESCO-Self	Mar-21
SledgeHammer Oil Tools	1MW	Faridabad	RESCO-Self	Nov-19
Mantora Oils Refinery	1MW	Kanpur	RESCO-Self	Jul-21
JK foods Limited	1.15MW	Greater Noida, Gajraula	RESCO-Self	Sep-21
Hindustan Salts Limited	1MW	Nawa, RJ	RESCO-Self	Sep-21
Shah infra group	500kW	Davangiri-KR	EPC- Shah Infra Group	Sep-18
Shilpa medicare group-	500kW	Raichure	EPC-Inok Mall	Mar-21
Total	**200MW+**			

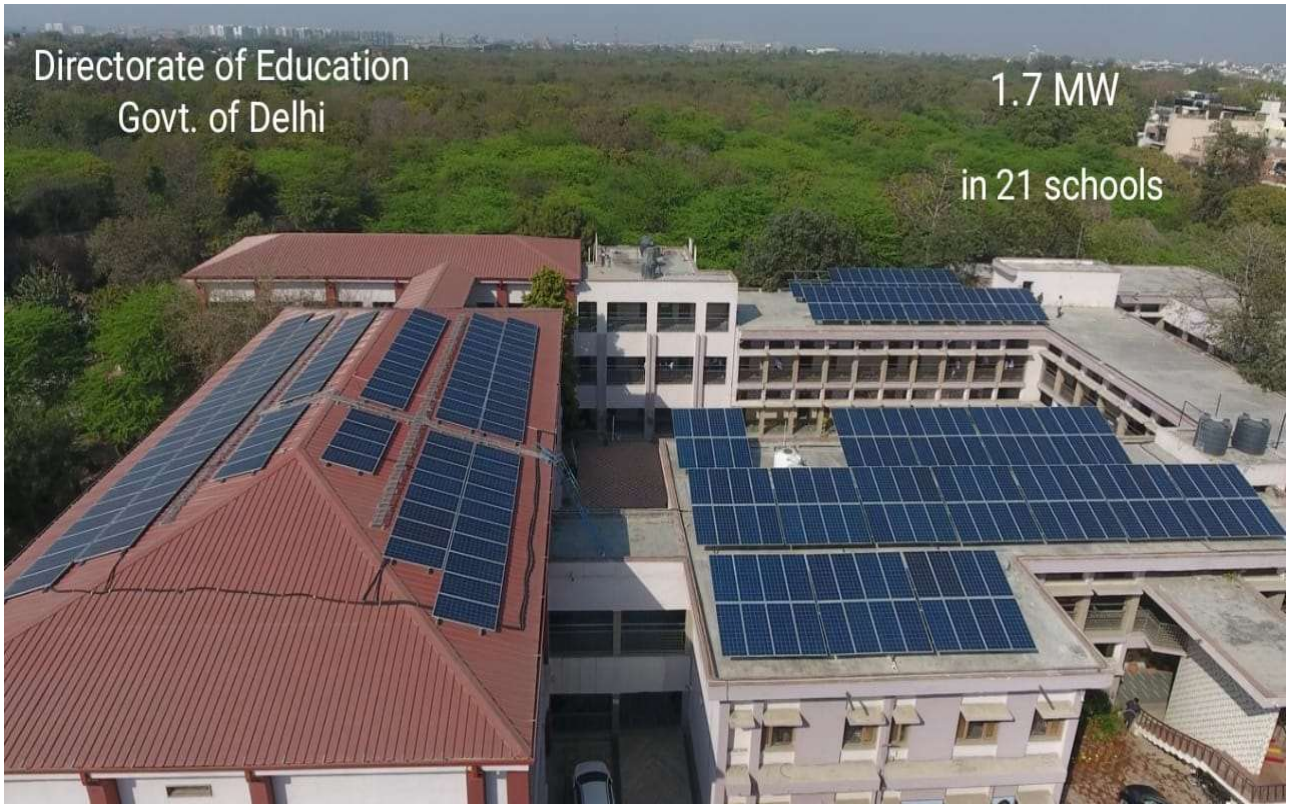
PROJECTS PICTURES

Solar Power Plant Pics (CO_2 emissions free electricity)

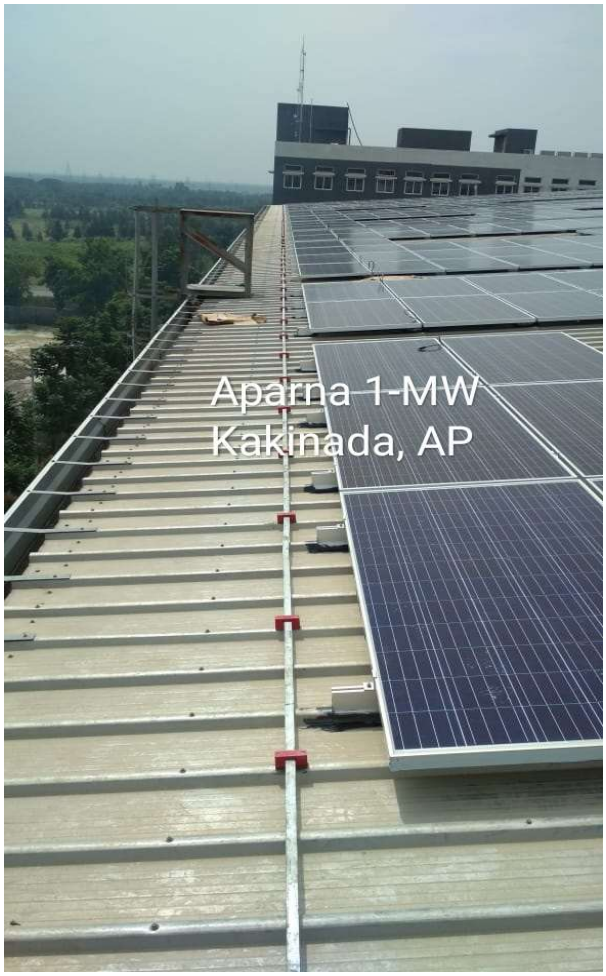

Saint Gobain, Bhiwadi 4.2 MWp

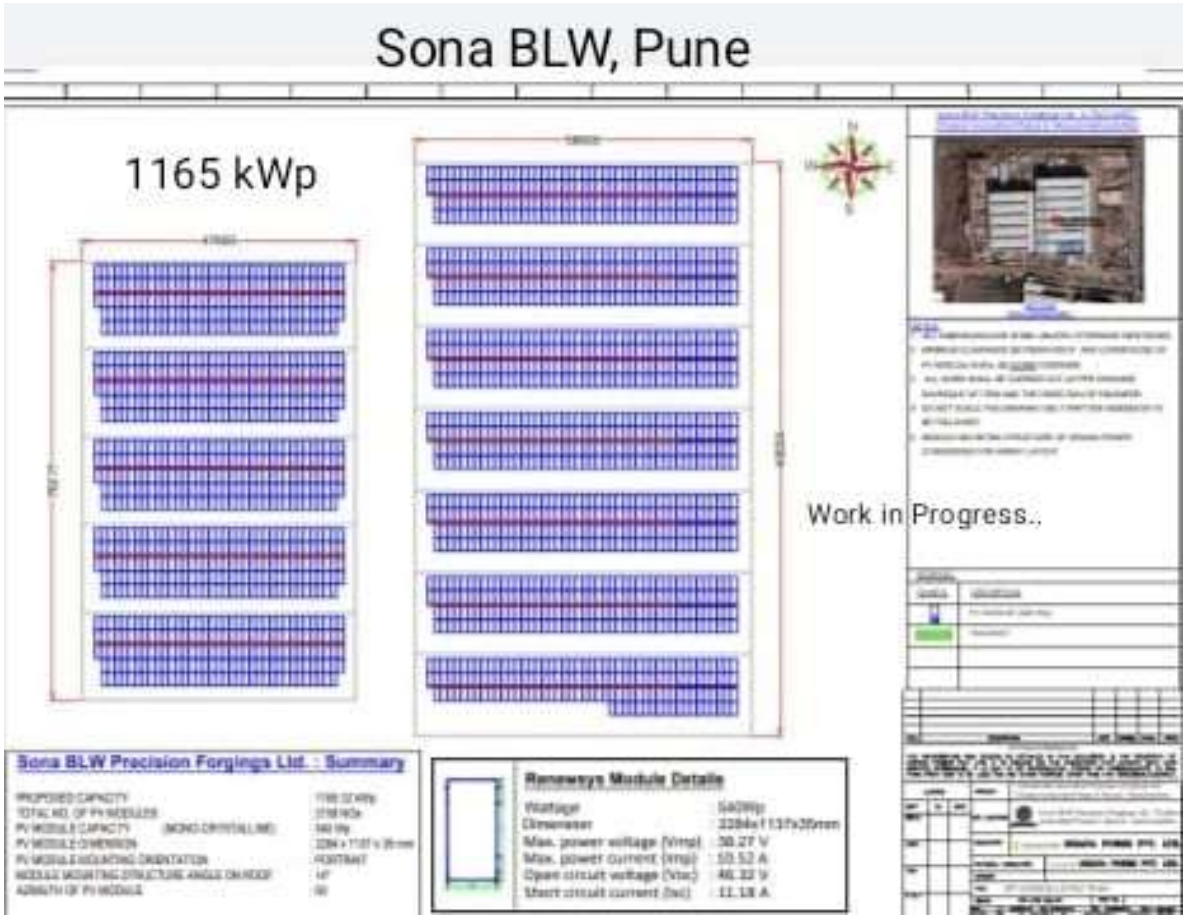

Electricity saving: Rs. 360 Cr
8 MW
CO_2 saved: 251,217 Ton
ORIANA POWER
Eqv. Trees Planted: 30,636,259
JK Lakshmi Cement, Sirohi, India

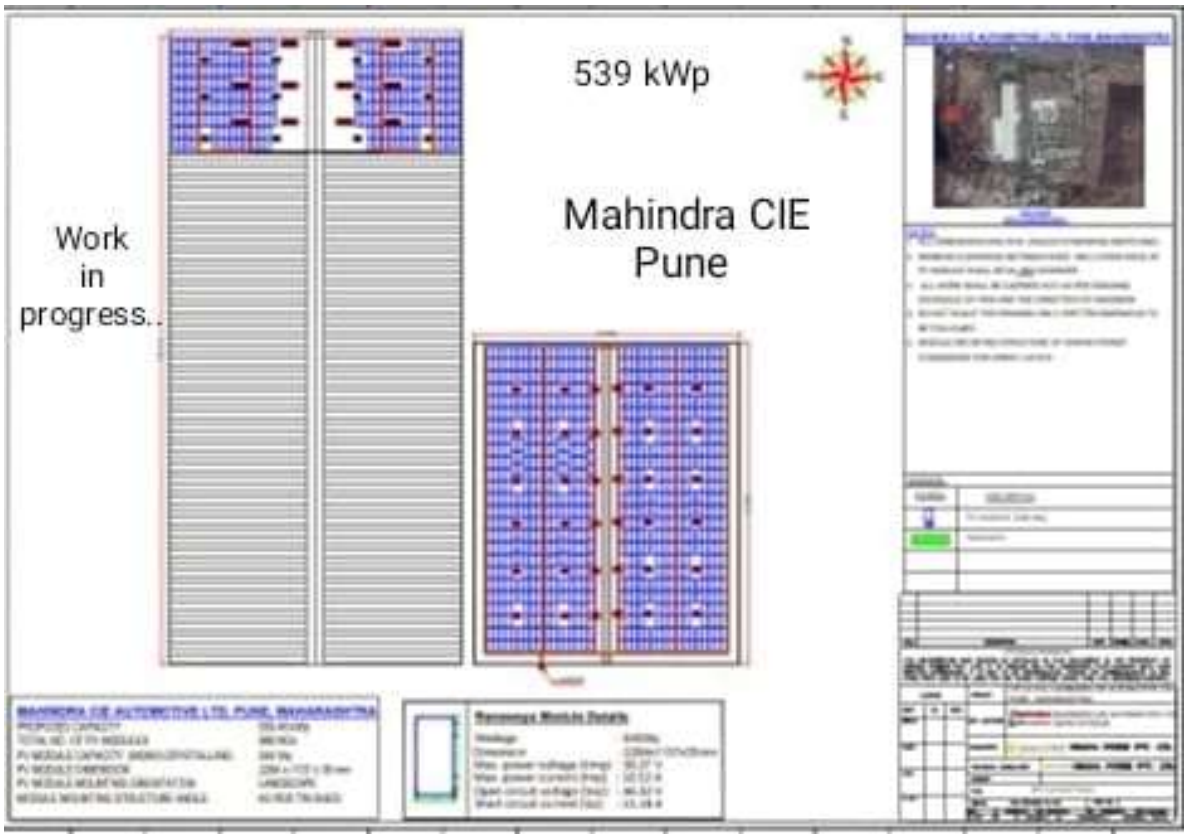

Mangalore
Hindustan Petroleum
1.3 MW
HPCL

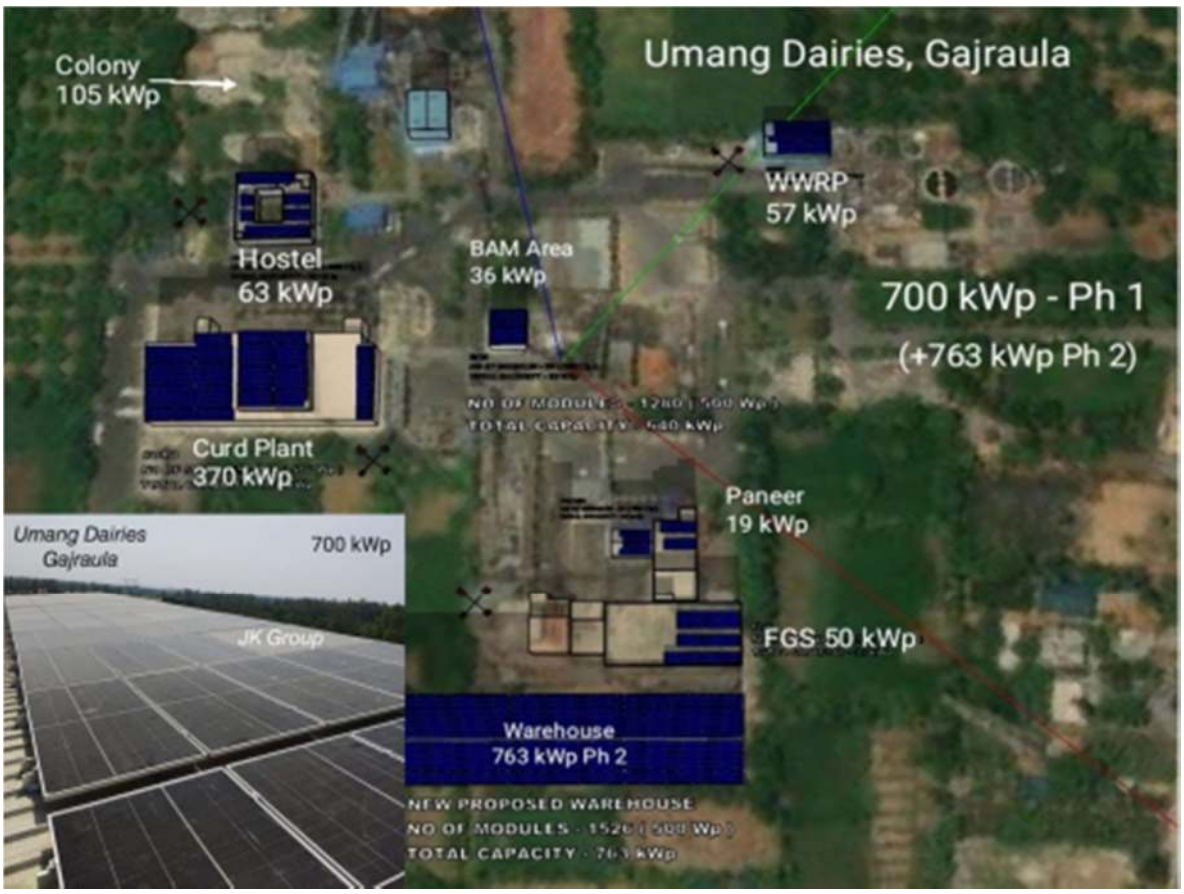

Directorate of Education
Govt. of Delhi
1.7 MW
in 21 schools


Shah Infra
Karur, Karnataka
400 kWp


Aparna 1-MW
Kakinada, AP

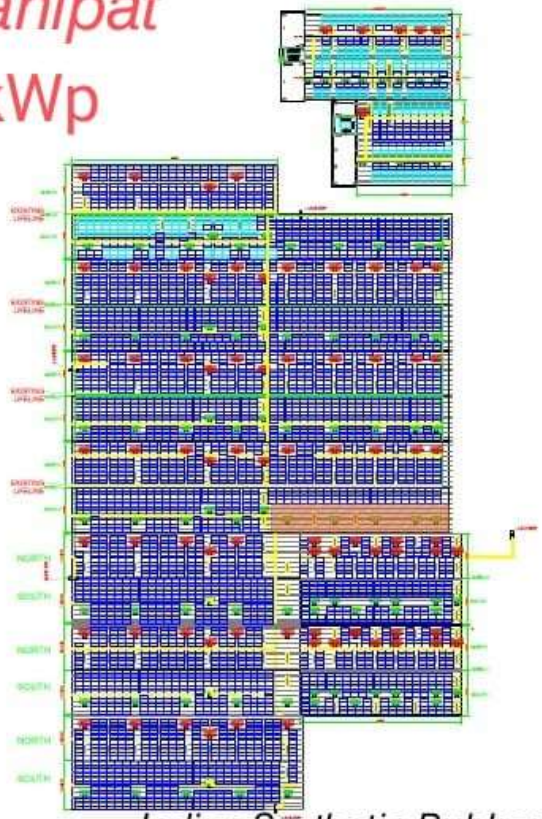

Sona BLW, Pune
1165 kWp
Work in Progress..
Sona BLW Precision Forgings Ltd. : Summary
Renewsys Module Details


539 kWp
Work
in
progress..
Mahindra CIE
Pune


Umang Dairies, Gajraula
Colony
105 kWp
WWRP
57 kWp
Hostel
63 kWp
BAM Area
36 kWp
700 kWp - Ph 1
(+763 kWp Ph 2)
Curd Plant
370 kWp
Paneer
19 kWp
FGS 50 kWp
Umang Dairies
Gajraula
700 kWp
JK Group
Warehouse
763 kWp Ph 2
NEW PROPOSED WAREHOUSE


JK Group
Umang Dairies
Gajraula
440 kWp
700 kWp
Terrestrial Foods
Gr. Noida

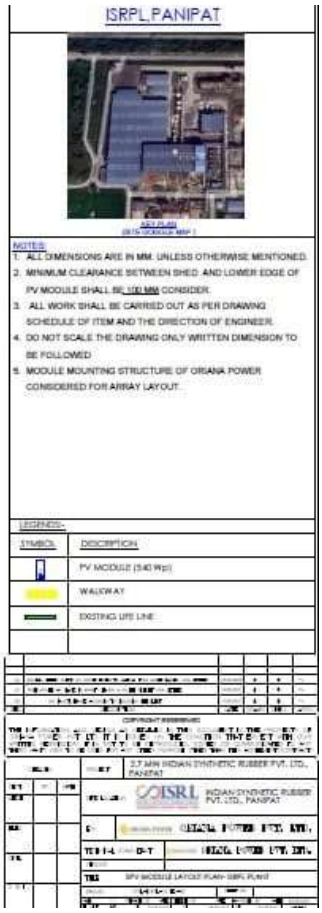
ISRPL, Panipat
2700 kWp



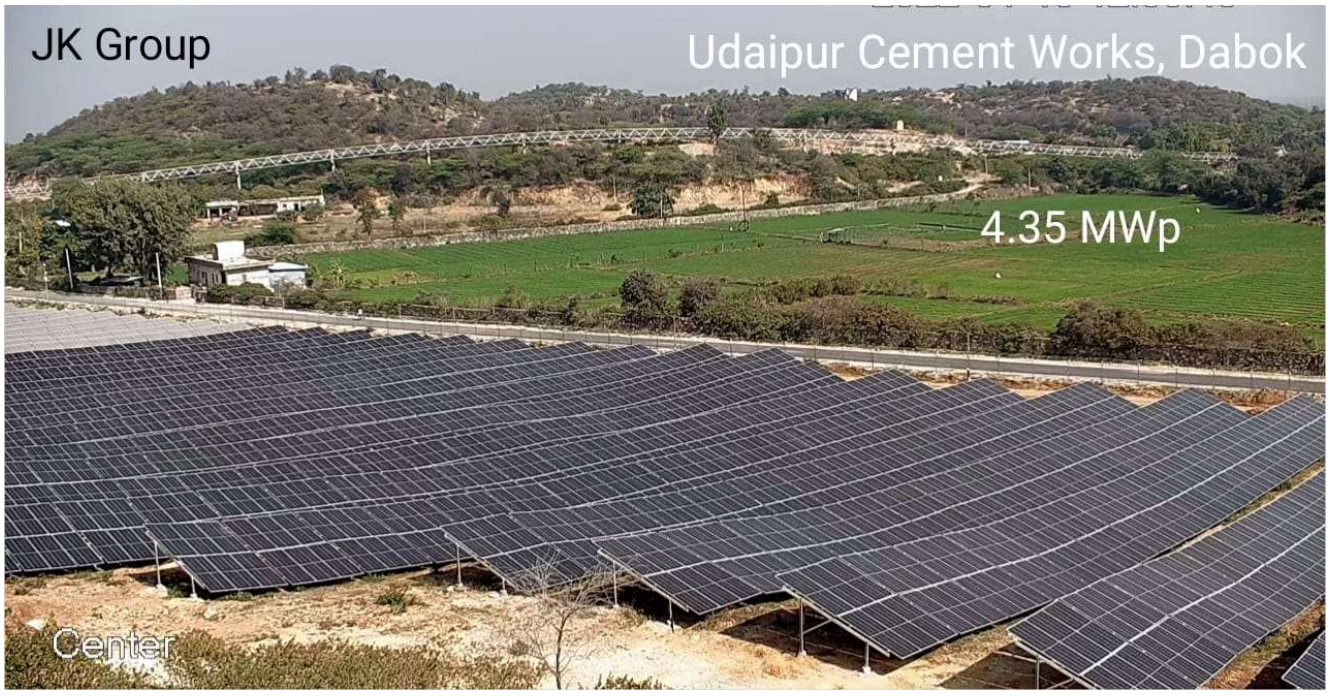
Work in progress..

Indian Synthetic Rubber Private Limited : SUMMARY

1	WORKSHOP	216	116.64kWp
2	STORE	168	90.72kWp
3	PRODUCT WAREHOUSE	264	142.56kWp
4	BOX WAREHOUSE	1260	680.4kWp
5	FINISHING	456	246.24kWp
	TOTAL	5004	2700.54kWp



Indian Synthetic Rubber P. Ltd.

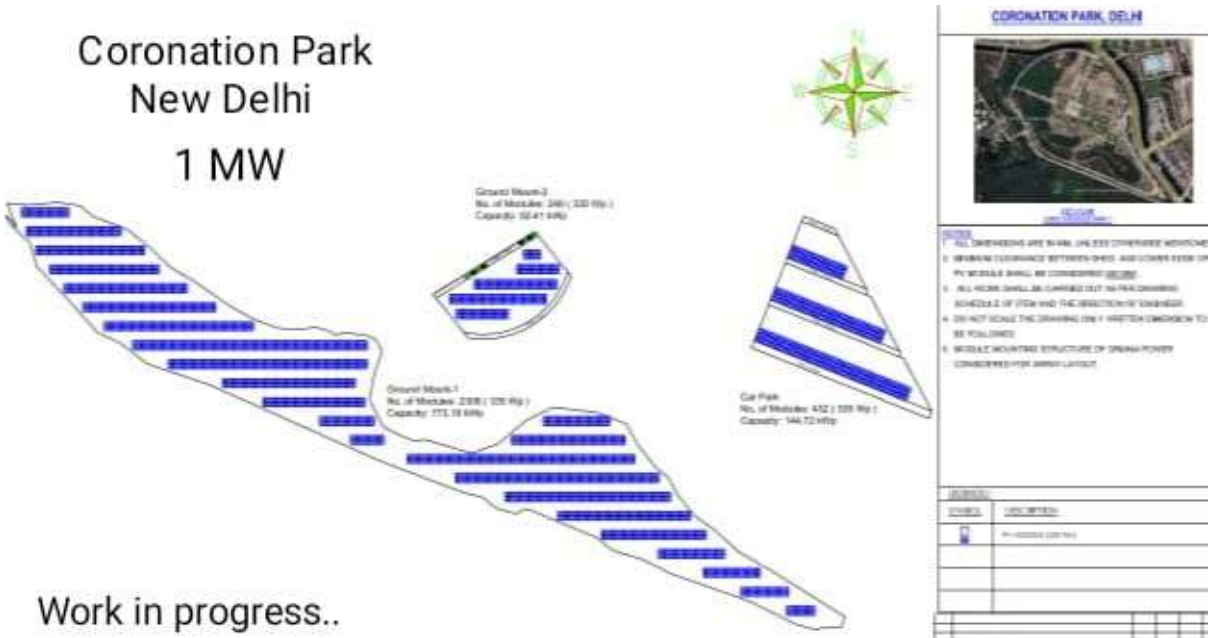



Cremica
Mumbai, Phillaur, Ludhiana
Tahliwal HP, Rajpura
2.6 MW
on Tin Sheds


Cremica, Gr. Noida
224.7 kWp


Indore
Symbiosis
300 kWp
Work in progress..

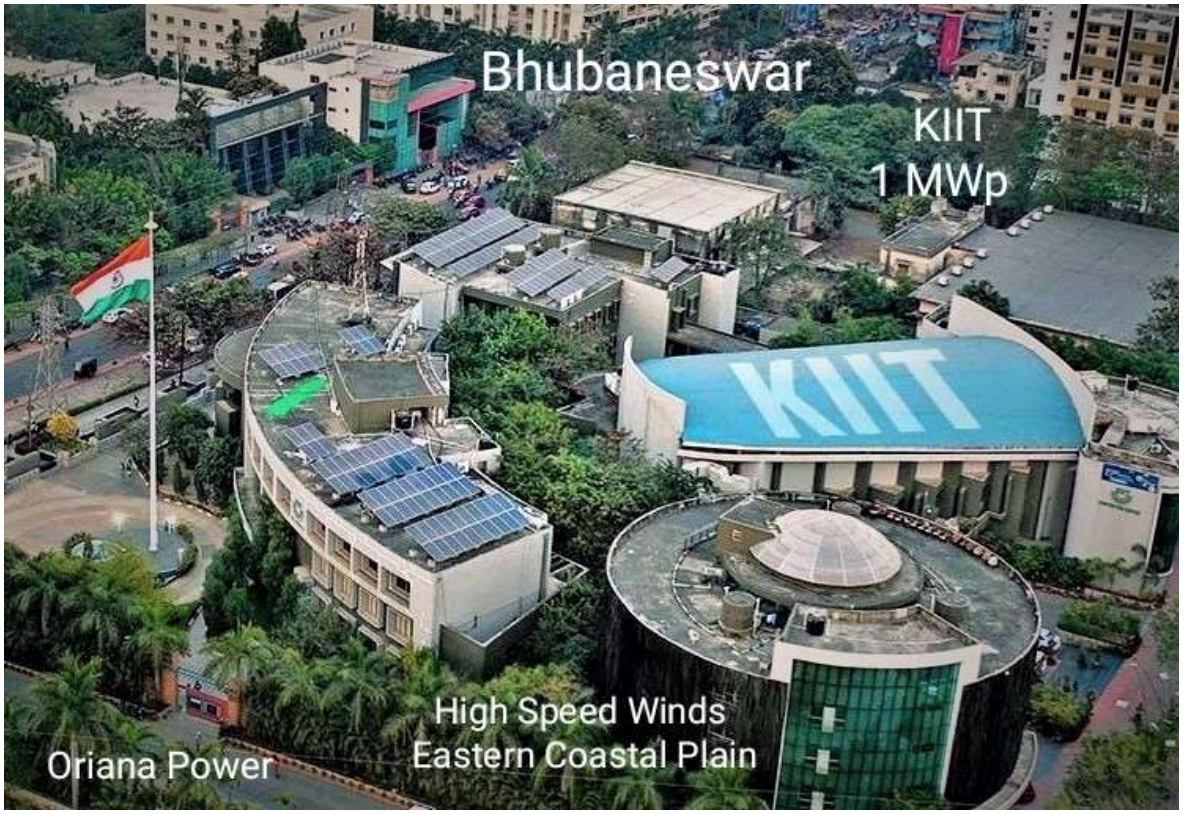
Coronation Park
New Delhi
1 MW

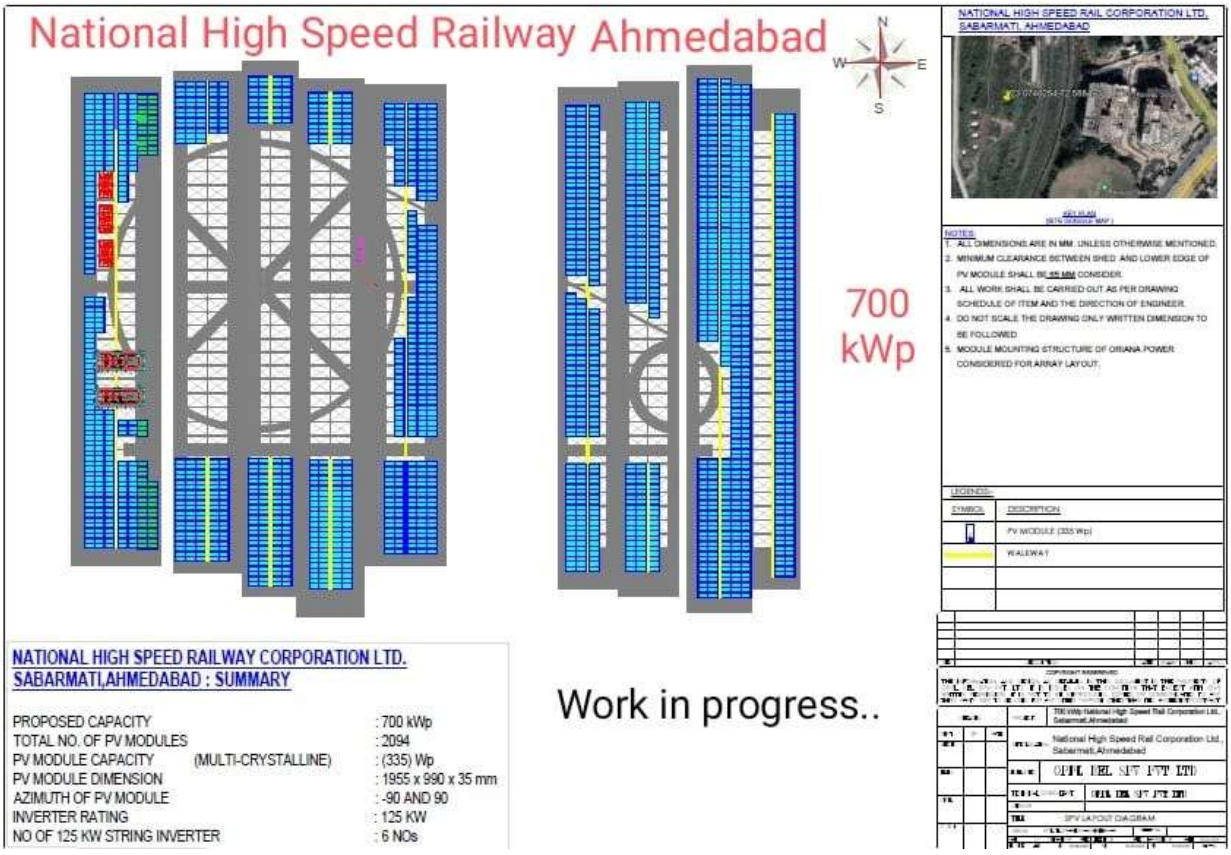


Work in progress..

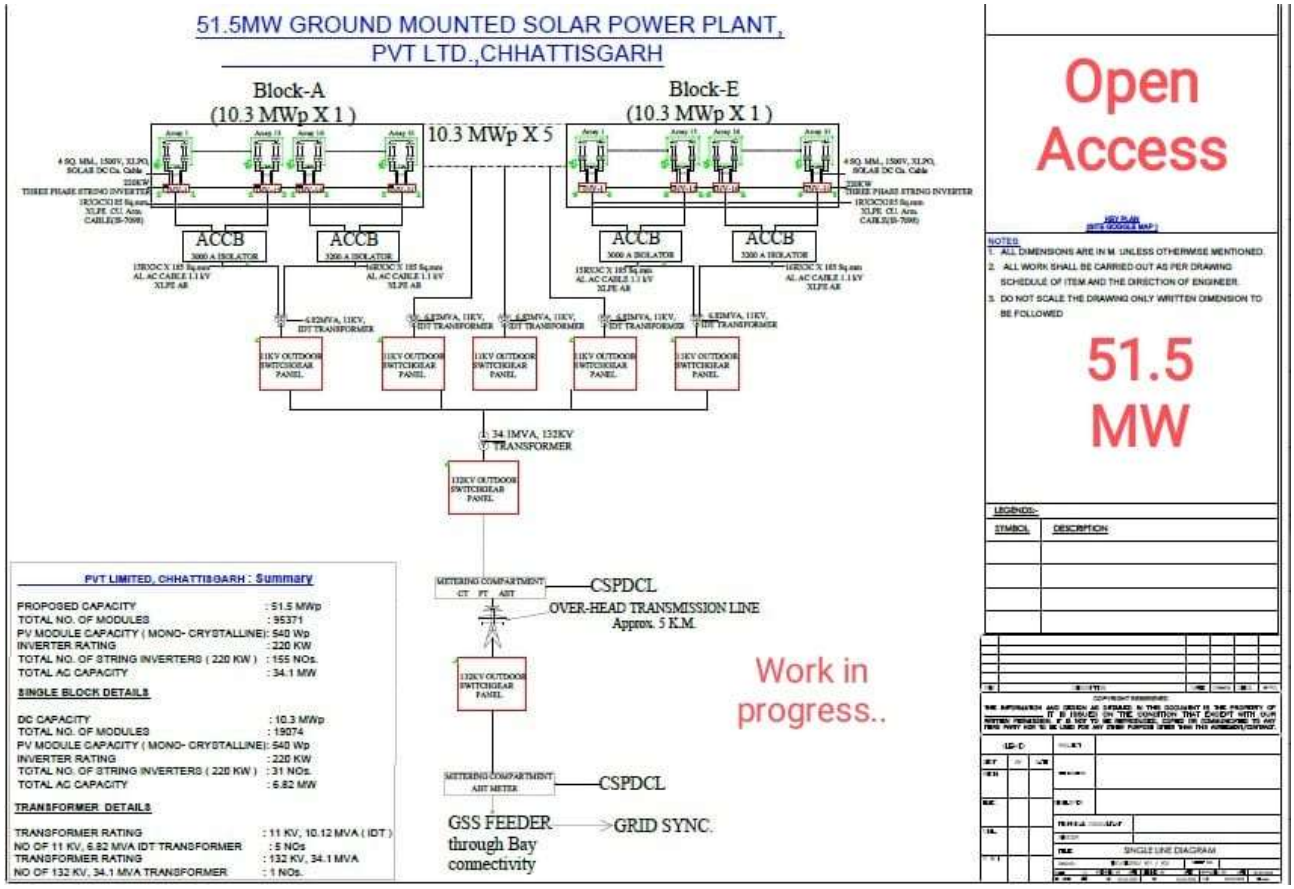
CORONATION PARK,MODEL TOWN,NEW DELHI : SUMMARY

PROPOSED CAPACITY	: 1 MWp
TOTAL NO. OF PV MODULES	:2988
PV MODULE CAPACITY (POLY-CRYSTALLINE)	: 335 Wp
PV MODULE MOUNTING ORIENTATION	: PORTRAIT
MODULE MOUNTING STRUCTURE ANGLE ON GROUND	:20
AZIMUTH OF PV MODULE	:0
MINIMUM HEIGHT OF PV MODULE FROM GROUND	: 500 MM


Bhubaneswar
KIIT
1 MWp
KIIT
High Speed Winds
Eastern Coastal Plain
Oriana Power


National High Speed Railway Ahmedabad
700
kWp
NATIONAL HIGH SPEED RAILWAY CORPORATION LTD.
SABARMATI,AHMEDABAD : SUMMARY
PROPOSED CAPACITY : 700 kWp
TOTAL NO. OF PV MODULES : 2094
PV MODULE CAPACITY (MULTI-CRYSTALLINE) : (335) Wp
PV MODULE DIMENSION : 1955 x 990 x 35 mm
AZIMUTH OF PV MODULE : -90 AND 90
INVERTER RATING : 125 KW
NO OF 125 KW STRING INVERTER : 6 NOs
Work in progress..
NATIONAL HIGH SPEED RAIL CORPORATION LTD.
SABARMATI, AHMEDABAD


RR Kabel
Silvasa
450 kWp


51.5MW GROUND MOUNTED SOLAR POWER PLANT,
PVT LTD.,CHHATTISGARH
Block-A
(10.3 MWp X 1)
10.3 MWp X 5
Block-E
(10.3 MWp X 1)
ACCB
ACCB
ACCB
ACCB
34.1MVA, 132KV
TRANSFORMER
132KV OUTDOOR SWITCHGEAR PANEL
METERING COMPARTMENT
CSPDCL
OVER-HEAD TRANSMISSION LINE
Approx. 5 K.M.
Work in progress..
METERING COMPARTMENT
CSPDCL
GSS FEEDER
through Bay connectivity
GRID SYNC.
PVT LIMITED, CHHATTISGARH : Summary
PROPOSED CAPACITY : 51.5 MWp
TOTAL NO. OF MODULES : 95371
PV MODULE CAPACITY (MONO- CRYSTALLINE): 540 Wp
INVERTER RATING : 220 KW
TOTAL NO. OF STRING INVERTERS (220 KW) : 155 NOs.
TOTAL AC CAPACITY : 34.1 MW
SINGLE BLOCK DETAILS
DC CAPACITY : 10.3 MWp
TOTAL NO. OF MODULES : 19074
PV MODULE CAPACITY (MONO- CRYSTALLINE): 540 Wp
INVERTER RATING : 220 KW
TOTAL NO. OF STRING INVERTERS (220 KW) : 31 NOs.
TOTAL AC CAPACITY : 6.82 MW
TRANSFORMER DETAILS
TRANSFORMER RATING : 11 KV, 10.12 MVA (IDT)
NO OF 11 KV, 6.82 MVA IDT TRANSFORMER : 5 NOs
TRANSFORMER RATING : 132 KV, 34.1 MVA
NO OF 132 KV, 34.1 MVA TRANSFORMER : 1 NOs.
Open Access
NOTES:
1. ALL DIMENSIONS ARE IN M. UNLESS OTHERWISE MENTIONED.
2. ALL WORK SHALL BE CARRIED OUT AS PER DRAWING SCHEDULE OF ITEM AND THE DIRECTION OF ENGINEER.
3. DO NOT SCALE THE DRAWING ONLY WRITTEN DIMENSION TO BE FOLLOWED
51.5 MW
LEGENDS:
SYMBOL
DESCRIPTION
SINGLE LINE DIAGRAM


MDPS
250
kWp
Faridabad


Mono Trina
645 Wp
Dehradun
800 kWp
Bifacial
Horawala


1 MW
Mantora Oil
Crompton Greaves, Goa
200 kWp
32.24 Lac


Anti-Skid Walkway

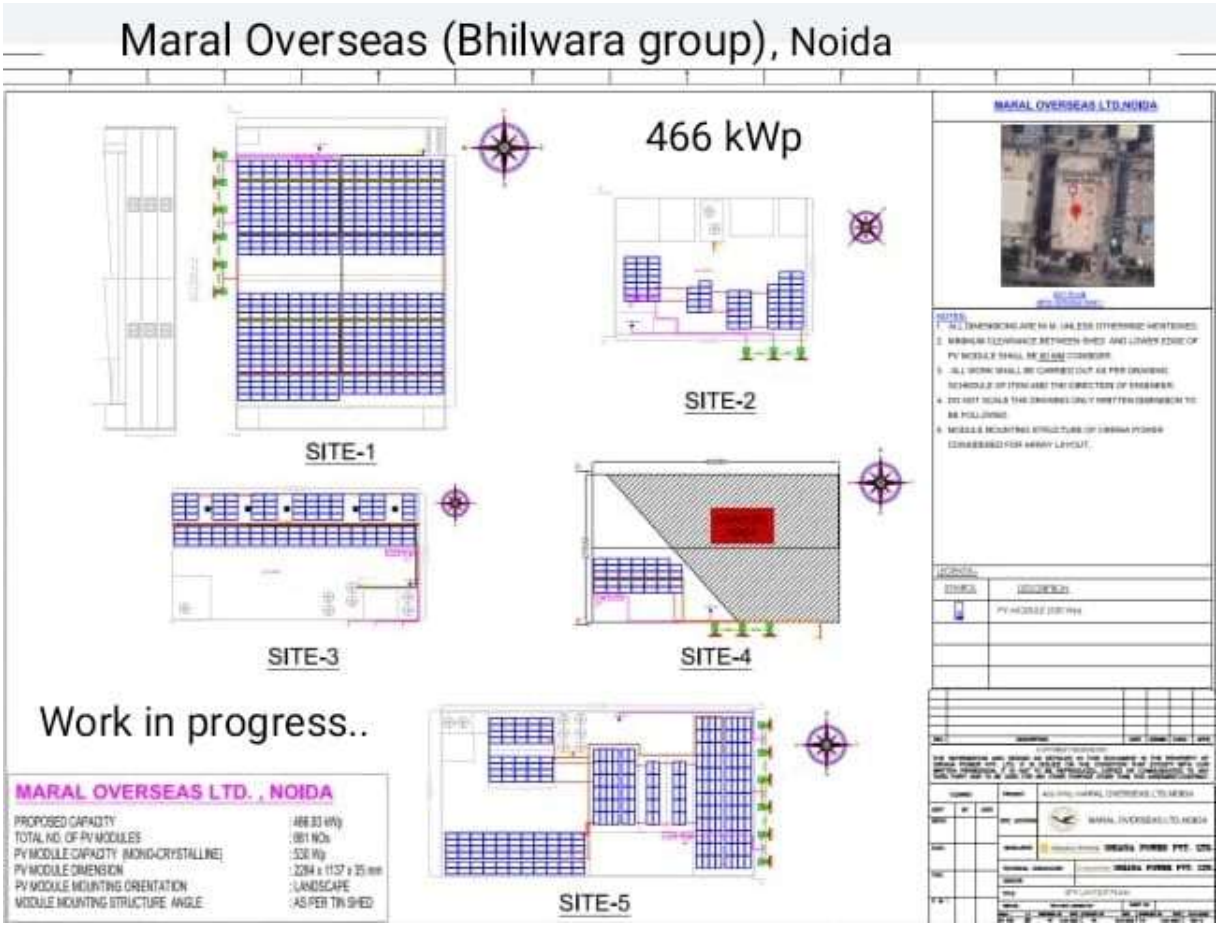

Carefully..
Panchwati Nutrients, Roorkee
400 kWp
..on
Fragile
Asbestos Cement
Sheds
North India
ORIANA POWER
May 2022


Sheesh Mahal Park
Delhi
871 kWp
Work in progress..
SHEESH MAHAL PARK, DELHI
SHEESH MAHAL PARK,SHALIMAR BAGH NEW DELHI : SUMMARY


Faridabad
1 MWp
SLEDGEHAMMER
Sledgehammer
Oil & Tools


Tata Memorial
Cancer Research Instt.
1 MW
Mullanpur,
Nr. Chandigarh

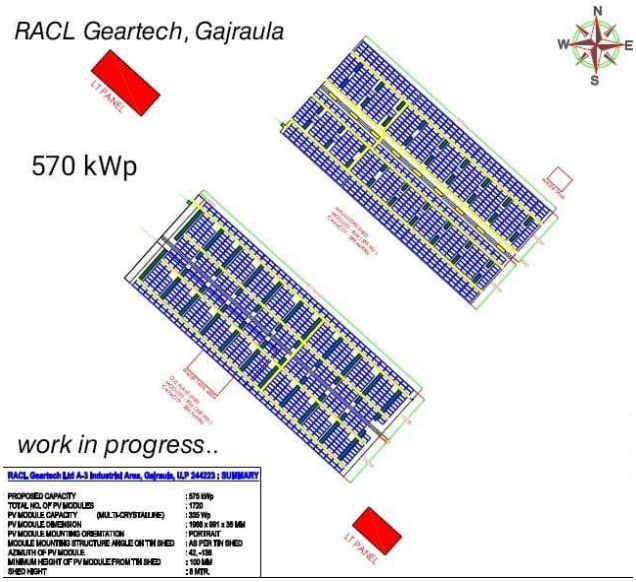

Super Structured
Solar Plant
USI – 270 kWp
Vansant Vihar


Maral Overseas (Bhilwara group), Noida
466 kWp
SITE-1
SITE-2
SITE-3
SITE-4
SITE-5
Work in progress..
MARAL OVERSEAS LTD. , NOIDA
PROPOSED CAPACITY
TOTAL NO. OF PV MODULES
PV MODULE CAPACITY (MONO-CRYSTALLINE)
PV MODULE DIMENSION
PV MODULE MOUNTING ORIENTATION
MODULE MOUNTING STRUCTURE ANGLE
: LANDSCAPE
: AS PER TIN SHED
MARAL OVERSEAS LTD,NOIDA


ORIANA POWER
Punjab..
Solar Capacity: 1 MW
CO2 Emissions Reduced Annually: 1200 Tons
Electricity Generation Annually: 14,60,000 units


1 MW
Sambhar Salts
Nawa, Jaipur


NGK Spark
Bawal
515 kWp


RACL Geartech, Gajraula
570 kWp
work in progress..
RACL Geartech Ltd A-3 Industrial Area, Gajraula, U.P 244223 ; SUMMARY
PROPOSED CAPACITY : 570 kWp
TOTAL NO. OF PV MODULES : 1720
PV MODULE CAPACITY (MULTI-CRYSTALLINE) : 335 Wp
PV MODULE DIMENSION : 1956 x 991 x 35 MM
PV MODULE MOUNTING ORIENTATION : PORTRAIT
MODULE MOUNTING STRUCTURE ANGLE ON TIN SHED : AS PER TIN SHED
AZIMUTH OF PV MODULE : 42.-138
MINIMUM HEIGHT OF PV MODULE FROM TIN SHED : 100 MM
SHED HIGHT : 8 MTR.


2.1 MWp
Gaja
Tehri Garhwal


SHED - 2 (NORTH)
MODULES - 208 (540 Wp)
CAPACITY - 112.32 kWp
Mahindra CIE
Lalpur
Uttrakhand
N
E
S
SHED - 1
MODULES - 780 (540 Wp)
CAPACITY - 421.2 kWp
650.16 kWp
MAHINDRA CIE AUTOMOTIVE LTD
STAMPINGS DIVISION
Lalpur, Uttarakhand 263148
MODULES - 1204 (540 Wp)
CAPACITY - 650.16 kWp
SHED - 2 (SOUTH)
MODULES - 216 (540 Wp)
CAPACITY - 116.64 kWp
Work in progress..


Adpack, Kenya
335 kWp
Kenya 3 MWp

Thanks & with Best Regards,

Harshit Pundir

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