

GRID CONNECTED ROOFTOP SOLAR POWER PLANT INSTALLED AT DISTRICT COURT, GARHWA



**HIGH COURT OF
JHARKHAND**



**NIGHT VIEW OF
HIGH COURT OF JHARKHAND**



**1st SOLAR COURT DISTRICT COURT, KHUNTI
From 2nd October, 2015**



**2nd SOLAR COURT DISTRICT COURT,
SAHIBGANJ From 6th April, 2017**



**3rd SOLAR COURT DISTRICT COURT, GARHWA
Experimental Basis From 14th July, 2016**



**CIVIL COURT
GARHWA**



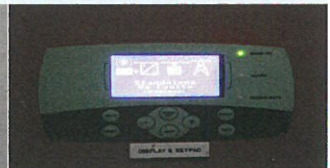
**DISTRICT COURT GARHWA
AT NIGHT**



**LOAD METER ON THE
CONTROL PANEL**



**NO FAULT STATUS OF CPU
ON FULL LOAD**



**BATTERY
BANK**



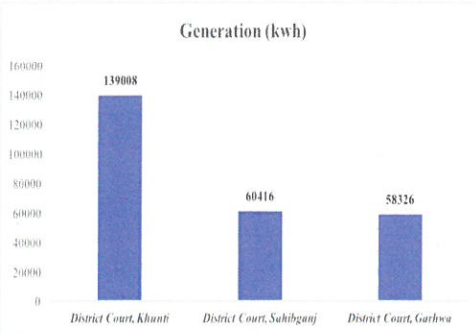
**DISTRICT COURT GARHWA
AT NIGHT**



**SOLAR ILLUMINATED ENTRANCE
AT NIGHT**



GENERATION OF ELECTRICITY AS ON 28.06.2017



SITE DETAILS OF DISTRICT COURT, GARHWA

- Site Location: District Court
- Latitude: 24°09'32.99"N,
- Longitude: 83°47'18.45"E
- Elevation (m): 197
- Area (sq. m): 2,600 sq. m.
- Shadow free Rooftop Area for PV System (sq. m): 1,270 sq. m.



GENERATING CAPACITY

- By this Solar Energy Generating Unit per Year approx. 1,32,000 Units will be generated.
- 58, 326 Units of Solar energy has been generated & consumed till 28.06.2017

LIFE OF PANELS

- Life of Solar Panel is Twenty Five Years.
- Each solar PV module is warranted by the manufacturer for at least 90% of its rated power after initial 10 years and 80% of its rated power after 25 years.
- Every Panel has 60 cells which are known as semi conductor cells made in Germany.
- These are Crystalline Cells which are more efficient than Amorphous Cells.

AREA OF SOLAR PANELS

- Dimension of one Panel: 1635 mm X 990 mm X45mm
- Total Nos. of Solar Panel: 440
- Area of Solar Panel: 713 Sq. meter
- Area occupied by the plant on the roof- 1210 sq. mt. (13025.6 sq. ft)

MAINTENANCE

Five Years comprehensive maintenance by the Contractor who installed the panels including:

- Washing of Panels,
- Battery Maintenance
- Power Conditioning Units (PCU) maintenance etc.
- Transmission lines
- Array Junction Box.
- And such other parts.
- Training i.e. Knowledge Transfer to three District Court Staffs.



MAJOR COMPONENTS OF SYSTEM

- Solar PV Modules
- PCU or Inverter
- Battery
- Module Mounting Structure
- Junction Box
- Data Logger
- Cables
- Bi-Directional Meter
- ACDB & DCDB



GRID CONNECTED ROOFTOP SOLAR POWER PLANT AT DISTRICT COURT, GARHWA

- High Court of Jharkhand initiated the proposal to install Grid Connected Rooftop Solar Power Plant in District Court, Garhwa after successful inauguration of Khunti which was the pilot project.
- Jharkhand Renewable Energy Development Agency (JREDA), under the Department of Energy, Govt. of Jharkhand is nodal agency for implementing the scheme.
- JREDA after the open tender process, awarded the work to M/s Kamala Instruments, Ranchi.
- Project cost is Rs. 1,48,50,000/- for 110 kWp Grid Connected Solar Power Plant with battery backup and five years Comprehensive Maintenance Contract (CMC).
- Project is funded by the State Government and MNRE, Govt. of India.

TIMELINE

- Date of issue of work order – 15th January, 2016
- Actual work started at site – 15th April, 2016
- Date of commissioning of the plant -14th July, 2016
- Plant is working on full load.
- Project was completed within scheduled period. .



GARHWA DISTRICT COURT PAST POWER CONDITION

- Frequent Power cuts number of times a day
- Every time when power fails, all the work of Court was affected.
- People had to wait for DG operation.
- Diesel consumption was too high.
- Voltage fluctuation
- Air Pollution due to DG running.

LOAD DETAILS OF DISTRICT COURT, GARHWA

| S. No. | Equipments | Quantity (Nos.) | Rating (Watt) | Load (Watt) |
|--------|-------------------------------|-----------------|---------------|---------------|
| 1 | Air Conditioners (1.5 Tonnes) | 26 | 1500 | 39000 |
| 2 | Air Conditioners (2.0 Tonnes) | 5 | 2000 | 10000 |
| 3 | Tube Light & Bulb | 196 | 40 | 7840 |
| 4 | Fan | 200 | 60 | 12000 |
| 5 | Server | 2 | 2000 | 4000 |
| 6 | Lifts | 2 | 20000 | 40000 |
| 7 | Computers | 50 | 100 | 5000 |
| 8 | Printers | 30 | 1000 | 30000 |
| 9 | Xerox | 1 | 1000 | 1000 |
| 10 | Fax Machine | 1 | 1000 | 1000 |
| 11 | Security Light | 24 | 250 | 6000 |
| | | | Total | 155840 |

SYSTEM DESIGN

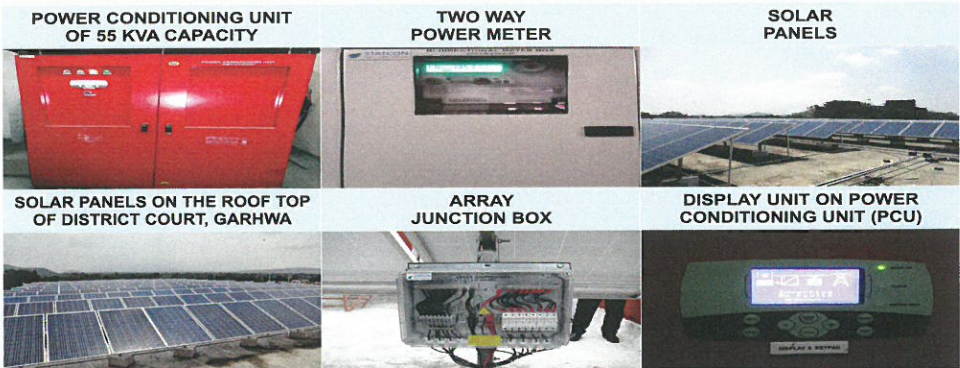
- Grid Connected Rooftop Solar Power Plant has been designed considering the peak load requirement, 15% losses, 70% depth of discharge of battery and 4 hours battery backup at full load.
- Photovoltaic Module capacity of the plant is 110 kWp (kilo Watt peak).
- Battery capacity for the backup power - 2x1100AH, 240V (2V, 1100 AH, 240 Nos.) Two banks.
- Time required for complete charging is six hours.
- Power Conditioning Unit (PCU):
to increase the reliability 2x55KVA/240V (2 Nos.) PCU has been installed.
- PCU in addition to battery charging during sunny hours, the loads are fed from SPV power plant.
- If the power generated from power plant is not sufficient to feed the loads then the balance power shall be fed by battery bank.
- In case battery bank is not sufficiently charged, then only, balance energy shall be drawn from the grid.
- Total of 440 nos. of 250 Wp each Solar Photovoltaic (SPV) module has been installed all on the rooftop of the District Court building for the capacity of 110 kWp Solar Power Plant.
- Plant has Net Metering facility.
- Plant will be under the Comprehensive Maintenance Contract (CMC) for next five years.
- Agency (M/s Kamala Instruments, Ranchi) will train the Personnel deputed by District Court for operation of the plant by way of KT (Knowledge Transfer).

HIGHLIGHTS OF THE PLANT

- 100% power requirement of District Court, Garhwa met by this plant.
- Expected life of the power plant is 25 years.
- High reliability due to use of two numbers of PCU.
- Remote Monitoring facility using GPRS and can be accessed from any place.
- Surplus power if any can be fed to the grid.

ADVANTAGES

- Freedom from hassles of Irregular Power Cuts.
- Uninterrupted Power Supply during day & night – Continuity of work maintained,
- Ensure Safety during night.
- Green Energy – less global warming, saving fossil fuel, less emission of green house gases, eco-friendly.
- DG running is almost zero. – Zero Pollution, Saving Money.
- On holidays or when court is closed extra power will be exported to grid - Saving Money.



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