

SPARK INDUSTRIES

**RATNA FARMER PRODUCER
SOLAR PROJECTS (100KW)
Technical Details**



By,
SPARK INDUSTRIES

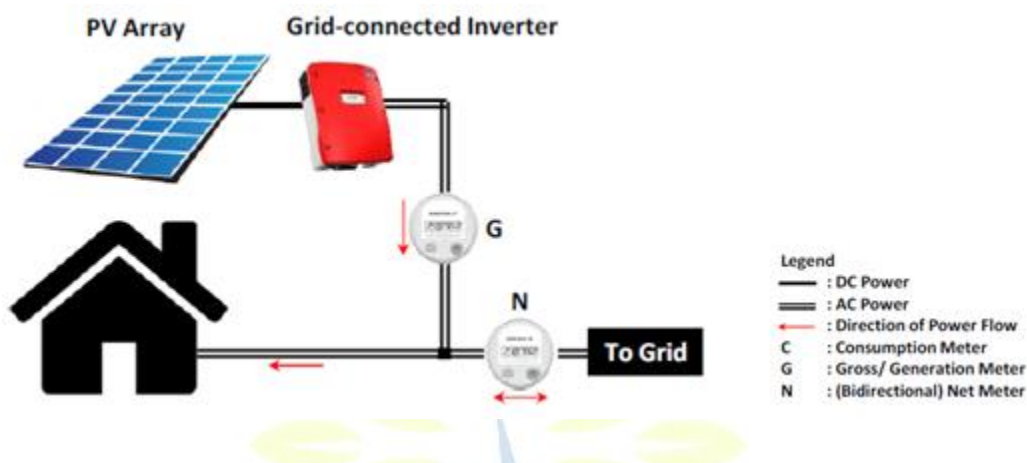
INDEX

SR. NO.	TITLE	PAGE NO.
1	SOLAR NET-METERING CONCEPT	2
2	CLIENT,METEO & PROJECT DETAILS	3
3	SOLAR SYSTEM PV DESIGN	8
4	OVERALL PLANT PERFORMANCE	9
5	FINANCIAL ANALYSIS & FEASIBILITY	10
6	NET CASH FLOW PER YEAR	10
7	TIMELINE OF PROJECT	11
8	STEPS TO FOLLOW FOR SOLAR PLANT	12
9	TERMS & CONDIDTIONS	14

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SOLAR NET-METERING CONCEPT



What is Net Metering?

Under net metering, electricity generated by the Solar Rooftop System is first utilized by the consumer to meet their internal/captive requirements. Excess electricity, if any, is exported to the grid. Subsequently, when the consumer imports power from the grid, the exports are adjusted against the imports, lowering the electricity bill.

What is a Net Meter?

A net meter (bi-directional meter) records the energy imported from the grid to meet the load and surplus energy exported to the grid after self-consumption. Both energy import and export are recorded in the net meter. The difference between export and import readings is the actual energy consumed/delivered.

What is the Method of Billing under Net Metering?

The energy generated from Solar Rooftop System shall be adjusted against the consumption of energy from the DISCOM by an eligible developer/consumer every month. In case of groups/societies, the energy generated shall be prorated as per the installed capacity share indicated in the Agreement between the group/society and DISCOM. This computed energy share shall be adjusted against the consumption of energy for each consumer every month.

In case of excess generation (after energy adjustment) injected into DISCOM network in a billing month will be carried forward to the next month till every quarter end and settlement will take place on an Average Cost of Supply (ACOS) basis for net metering as determined by MERC from time to time.

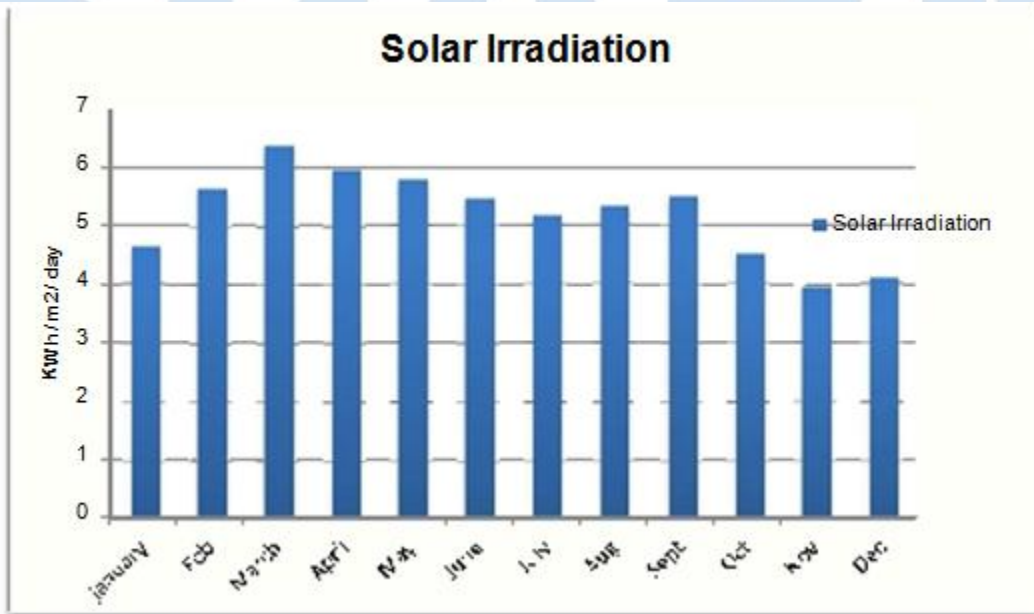
CLIENT, METEO AND PROJECT DETAILS

- CLIENT DETAILS

Country	INDIA
Location	Gotkhidi, Ashta
Contact ID	—
Contact Person	—
Company/Society	Ratna Farmer Producer
Purpose	Solar Rooftop Net-metering Grid Connectivity

- METEO DETAILS

Location Co-ordinates	16.8524° N, 74.5815° E
Ambient Temp	29°
Daily Solar Irradiation	5.19 Kwh/Day
Average Temperature	30°



- **PROJECT DETAILS**

Type of Installation	Solar Rooftop Net-metering Grid Connectivity
Estimated Array peak power	(100) KW
Shading Consideration	Shade Free
Grid Voltage	415 V
Phase Consideration	3-Phase
Gird Frequency	50 Hz
Required Area (panel area 5.5 sq m per KW)	(6500 sq. ft.) 650 sq.m approx
Safety Level	IP 65
<i><u>Service Care Visit: Every 6 months (June/Dec) visit-Basic checkup, data analysis.</u></i>	



SOLAR ROOFTOP INDUSTRIAL ON GRID SOLUTIONS

SPARK/WAAREE/RENEWSYS SOLAR PV MODULE

High Output Power
High Efficiency: 20.7 %
Product warranty: 12 Year
Performance warranty: 25 Year



GROWATT/POLYCAB- ON GRID INVERTERS

- Three Phase,
- High efficiency inverter up to 98 %
- Built in DC Switch,
- WiFi / GPRS Data logger, RS485
- IEC – under certification



MOUNTING STRUCTURES & ACCESSORIES

Distribution Boxes: These systems facilitate flow of current from DC side to AC side with proper protection.

Module Mounting Structures: The structures are mounted in such a way that the roof is not damaged. The structures are leak proof to avoid water leakage.

Cables and protection devices: Cables to transmit currents and protection devices to keep the system protected from lightening and other electric surges.

Cleaning System: Sprinkler based panel cleaning system



SOLAR PV SYSTEM DESIGN

● SYSTEM OVERVIEW (110 KW)

Components	Make	Specification	110 KW
Solar Module	Renewsys/Waree/Spark	540 Wp Monoperc (halfcut), (20.98%) 12 yrs, Product 27 yrs, Perf.	185 (100 KW)
Solar Inverter	Growatt/Polycab	3 Phase- Grid Tie, MPPT, (Eff. 98%) Std. Warranty-05 Years	01 (100 KW)
Mounting Structure	GI/ Aluminium	Railing or Structure	Yes
DCDB	ABB/Schneider	(Fuse/MCB, Surge Arrestor, IP65 box) As per IEC standard	01
ACDB	ABB/Schneider	(Fuse/MCB, Surge Arrestor, IP65 box) As per IEC standard	01
Wiring/Cables	Polycab-DC-04 sq mm AC- 4C Armoured Al Cable 70 Sq.mm	As per IEC standard	Yes
Cable Protection	HDPE Pipes	As per Req	Yes
Earthing	Self-Manufactured- Chemical Earthing (GI pipe with Aluminium Strip)	Heavy duty GI pipes, 50mm dia, 2ft long	Yes
LA LA Conductor	Aluminium Spike Strip or Cable	20mm dia with 3m height As per Req	Yes
AMC	--	05 Years (free)	Yes
Inverter Wifi Access	--	As per company	Yes
Net-Metering	L&T, HPL,Secure	As per MSEDCL	Yes
Time Period	--	Approximately	80
Average Payback Time (months)			35
COSTING (Inclusive GST-12%+18%) in lacs			Rs.(57.5 L)

OVERALL POWER-PLANT PERFORMANCE

Contents	100 KW		
Plant Production (4.0 Units/KW) per month	12000		
Specific Production (1 % consumption) + Overall Losses (1 %)	240		
Normalized Production	11760		
Overall Performance	98%		
<i>Service Care Visit: Every 6 months (June/Dec) visit-Basic checkup, data analysis.</i>			

TIME LINE OF PROJECT

Procurement	<ul style="list-style-type: none"> Purchase Procedure (BOQ) & Material Delivery 20 Days
Construction	<ul style="list-style-type: none"> Installation Process (Electrical & Civil Works) 10 Days
Commissioning	<ul style="list-style-type: none"> Commissioning by Govt. body or 3rd party 20 Days
MSEB Sanctioning Process	<ul style="list-style-type: none"> Agreement with State Utility 30 Days
Total Periods	80 Days (2.5 Months)-combined
Service Care Visit	
Service Care Visit	<ul style="list-style-type: none"> 5 Years (Free) Every 6 Months Service Visit (June/Dec). System Check/Maintenance.
	<ul style="list-style-type: none"> 5 Years (Paid-optional). Every 6 Months Service Visit (June/Dec). System Check/Maintenance.

STEPS TO FOLLOW

METHODOLOGY FOR SOLAR POWER PROJECTS

This methodology is applicable to the solar power projects included in the composite policy for new and renewable (non-conventional energy sources) power projects dated 20th July 2015. The policy prescribes a target of 7500 MW in respect of solar power projects.

1. The minimum capacity for solar power projects shall be 1 MW (outside solar park). **The approval for grid connectivity will be given in accordance with the following guidelines -**

Procedure for Application for connectivity of Roof-top Solar PV System with Distribution Licensee's Network

(a) A consumer intending to set up a Roof-top Solar Net Metering System or who has already installed such a System may download the Application Form from the MSEDCL's website www.mahadiscom.in and submit it, duly filled, along with technical details of the System to the concerned office of MSEDCL along with registration fee, or apply and pay the fee online.

(b) Duly filled Application Form, in prescribed format, shall be submitted to the office of the respective nodal officer/ authorities authorized for billing along with requisite Processing Fees (non-refundable) and certified true copies of the documents as may be required /informed from time to time as under:

Voltage level	Threshold limit of Rooftop Solar PV system	Authority to which the application is to be submitted (MSEDCL concerned office)
230/240V(1 Φ)	Less than 8 kW/40 A	Concerned Sub-division Office
400/415 V(3 Φ)	Less than 150kW/187 kVA (in Municipal Corporation areas) Less than 80kW/100 kVA (in other areas)	Concerned Sub-division Office
11kV and above	Above 150KW/187 KVA and less than 1000 KVA (in Mumbai Metropolitan Region) Above 80 kW/100 kVA and less than 1000 kVA (in other areas)	Concerned Circle office

MSEDCL's concerned office shall register the Application in separate register on first come first basis and acknowledge its receipt within three working days; or intimate the Applicant within that period of any deficiency or incompleteness.

(d) MSEDCL concerned office shall conduct a technical feasibility study within 15 working days from the registration of the Application considering the following aspects:—

- (i) AC Voltage level at which connectivity is sought;
- (ii) Sanctioned Load / Contract Demand of the Applicant;
- (iii) Rated Output AC Voltage of the proposed Roof-top Solar PV System;
- (iv) Available cumulative capacity of relevant Distribution Transformer;

(e) Before rejecting any application for setting up a Roof-top Solar PV System at a particular Distribution Transformer, MSEDCL concerned officer shall serve the Applicant with a notice to rectify, within 15 days or such longer period as may be necessary, the deficiencies.

(f) If found technically feasible, MSEDCL shall, within 7 working days of the completion of the feasibility study, convey its approval for installing the Roof-top Solar PV System. The approval shall indicate the maximum permissible capacity of the System, and shall be valid for a period of 6 months from the date of approval, or such extended period as may be agreed to by the MSEDCL.

(g) The Applicant shall, within the period of validity of such approval, submit the work completion report, along with relevant details (such as technical specifications, test reports received from manufacturer / system provider, etc.), with a request to the MSEDCL for the testing and commissioning of the Roof-top Solar PV System.

(h) MSEDCL shall complete the testing and commissioning of the System within 10 working days from receipt of such request, and shall install the Net Metering equipment and synchronise the Roof-top Solar PV System within 10 working days thereafter.

(i) The Eligible Consumer and MSEDCL shall enter into a Net Metering Connection Agreement in the prescribed format after the Roof-Top Solar PV System is installed but before it is synchronized with the distribution Network.

TERMS & CONDITIONS

- 1. Payment:** Payment of the Purchase Price shall be made by Buyer to Company in accordance with the following schedule:
- i. Advance : (80%)
 - ii. Material Delivery : (10%)
 - iii. Site Installation : (10%)

Buyer should be liable to pay the entire pending amount as mentioned above before receiving the final invoice. All invoices submitted to Buyer by Company shall list the items of Equipment purchased thereunder in the same sequence used in Buyer's Purchase Order for such Equipment. Buyer's Purchase Order Number shall appear on all invoices submitted to Buyer here under.

- 2. Taxes:** The equipment sold to Buyer by Company falls in 12% & 18% GST under **Goods and Services Tax Act, 2017**. All invoices made will include 12% & 18% GST with **GSTIN- 27DLOPS4838A1ZR**.

- 3. Site Evaluation:** At no cost or expense to Buyer, Company shall furnish Buyer with site preparation studies, which shall include, Site Survey-System Designing-System Approval with Divisional Electrical Inspector, with respect to the Equipment.

- 4. Site Preparation:** Buyer shall be responsible for preparing a site suitable for the installation and operation of the Equipment (hereinafter "Installation Site").

- 5. Delivery:** Delivery of the Equipment to Buyer by Company, at Company's sole cost and expense, shall be made within three (2) weeks after receipt of a purchase order. Delivery of the Equipment in an undamaged condition to Buyer's Installation Site shall constitute "Delivery" to Buyer. Risk of loss during transit shall remain with Company.

A **packing slip/delivery challan** indicating each item and item quantity shipped shall accompany every shipment. The packing list shall be attached to the exterior of one of the containers in each shipment in a conspicuous manner.

All items "not found" shall be noted and the anticipated availability of the items shall be indicated clearly on the packing list. No substitutions shall be made without prior authorization by Buyer's.

- 6. Installation:** Company shall install the Equipment at the Installation Site in accordance with the installation schedule and design approved, only after the total approval of MSEB and Divisional Electrical Inspector for Net Meter. Company shall be responsible for all costs associated with delivery and installation of the Equipment. Time is of the essence to this Agreement.

Note: Company shall comply with all permits and licenses required by MSEB authorities in connection with the delivery and installation of the Equipment.

7. Testing and Certification: Upon completion of installation of the Equipment, Company shall perform prescribed tests to determine that the Equipment is operating in conformance with Company's published performance specifications for the Equipment. Two (2) copies of Test Certificates, Service Instruction and Basic Operational Manuals are to be provided to Buyer by Company.

8. Acceptance: "Acceptance" of the Equipment and Invoices shall be deemed to occur on the date when, in the reasonable opinion of Buyer, the Equipment conforms to the Specifications, and has continuously operated in compliance with the Specifications for ten (10) days after Equipment Installation.

9. Equipment Warranty: The warranty certificate should be provided to Buyer by Company with respect to the Equipment. The warranty period shall commence upon commissioning of the Equipment.

- Warranty will cover on manufacture and workmanship defects only.
- Warranty will not cover damage of product resulting from misuse or negligence of Buyer.

10. Equipment Service:

- As per the company policies Lifetime Service is given to customer which includes (5 years' free care, rest will be paid).
- Service Visit will be twice a year (June/December) every year.
- Charges will be applied for each replacement or new equipment's after completion of warranty period.

11. Construction and Jurisdiction: This Agreement shall be governed by the laws of the State of Maharashtra under Sangli Jurisdiction.



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SOLAR SITE PHOTOS



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VITA-ISLAMPUR-SANGLI-ATPADI



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SPARK INDUSTRIES
VITA-ISLAMPUR-SANGLI-ATPADI

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Ac No. : 919020071496114
Bank Name : AXIS
Branch: Vita
IFSC Code : UTIB0002839

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