



7.1.2 : The Institution has facilities for alternate sources of energy and energy conservation measures

Solar Energy

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1. Solar Energy Project- 400 KW Solar Roof Top PV Plant:

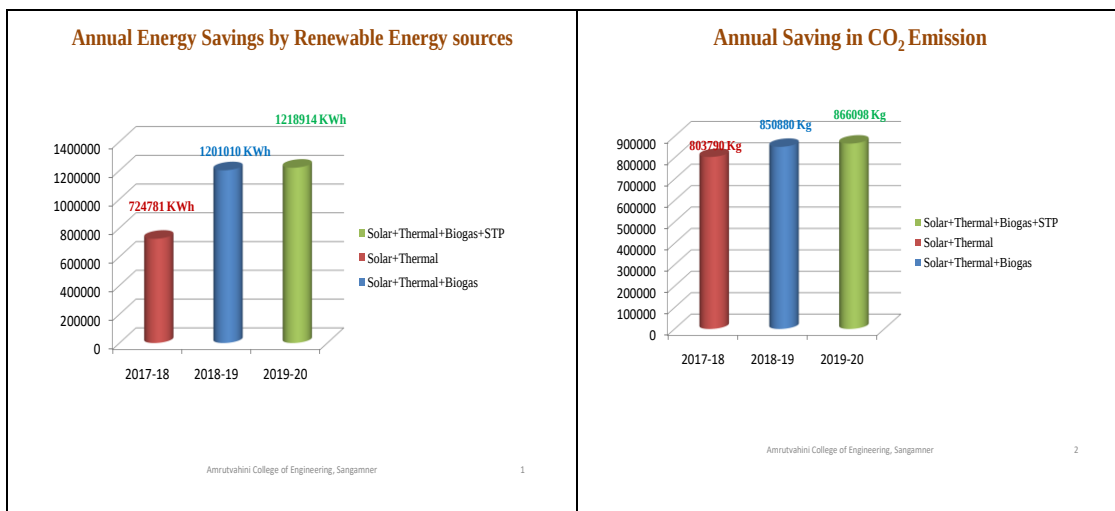
- Institute has installed 400 KW Solar Roof Top PV Plant as a clean energy project to make the campus eco-friendly. The project has been successfully installed and generating power which is more than energy requirement of the campus. The surplus power is export to MSEDCL (2.87 Lakh units)
- Effective utilization of natural sunlight in the campus.
- Using solar water heater at hostels. (capacity 41000 Litres per day)
- Use of Solar street lights in the campus.

Solar Roof Top PV Plant SRTPV Impact





Installation cost (Rs. In lakhs)	= 148.25
Generated electricity	= 1303 Mwh
Estimated saving (Rs. In lakhs)	= 177.86
CO2 Saving	= 782600 Kg



Outcomes:

1. Awarded as “Energy efficient Unit” in 21st National Energy Award for Excellence in Energy Management organized by Confederation of Indian Industry (CII).
2. 12th State Level Energy Conservation Award of excellence in energy conservation and management by MEDA.
3. Clean and Green Campus Award from AICTE, New Delhi.
4. Reduction in Energy Consumption as Reflected in Electricity bill.



Student Solar Ambassadors Workshop Organized in Association with IIT Bombay

Organized Students Solar Ambassador Workshop in association with IIT Bombay on 2nd October 2019, 150th Birth anniversary of Mahatma Gandhi where in 875 students and 40 trainers from institute participated which was Guinness World record event (Gandhi Global Solar Yatra). Trainers trained the students for assembling the solar-LED lamp unit and learnt practical skills.

2. Solar-Wind Hybrid Plant: Photo





3. Solar Water Heaters: Photos





Amrutvahini College of Engineering, Sangamner

4. Purchase Order of 100kWp Solar Photo Voltaic Plant:

Amrutvahini Sheti And Shikshan Vikas Sanstha's
Amrutvahini College Of Engineering Ghulewadi, Sangamner.
 P.O. Sangamner S.K. Tal-Sangamner, Dist-Ahmednagar-422 608, Phone No-02425-259016/259017

:-PURCHASE ORDER:-

Order No. AE Purchase Electrical Dept. / 2017-2018

Date:- 03/08/2017

To,

M/S:- Ravindra Energy Limited,
 BC- 109, Davidson Road, Camp,
 Belgaum - 590 001, Karnataka, India.

Ref:- Your Quotation No. ----- & Date:- 24/05/2017.

Ref:- Our Quotation No. ---- & Date:- 23/03/2017.

Dear Sir,

With reference to your above cited quotation. We are pleased to place our order for supplying the following goods as per the term and conditions mentioned below. Please acknowledge receipt of the order.

Sr. No	Particulars	Quantity	Rate	Total Rs
1	100 kw SRTPV Systems – Solar Photo Voltaic Modules – 323 Nos. Make / Vendor – Vikram Solar. Specification – * Module Capacity - 310 Wp, 72 Polycrystalline solar cells. * Cell Encapsulant - EVA (Ethylene Vinyl Acetate) type * Module Size - 1960 x 990 x 45mm, Wt: 22.5 kg * string arrangement - 20 modules * Module Efficiency - 16.15% * Superstrate - High Transmission low iron tempered glass, AR coated. * Temperature Range - -40°C to +85°C * Module Frame - Anodized aluminum frame with twin wall profile * Junction Box - IP67, 3 bypass diodes * Performance Warranty - Linear power warranty for 27 years with 2.5% for 1st year degradation and 0.67% from 2 to 27 year * Approvals and Certificates - IEC 6125 Ed2, IEC 61730, IEC 61701, IEC 62716, CE, MCS, PV Cycle, IEC 62804	01 Set.	35,25,000=00	35,25,000=00
1.1	Power Conditioning Unit (PCU) Invertor – 50KW x 02 Nos. Make / Vendor – Delta make. Specification – * Maximum Input Voltage - :1000 V (DC) * MPPT Voltage range - :520-800 V (DC) * Start-Up Voltage - : >250V (DC)			

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- * DC/AC disconnection Switch - : Provided (in-built)
- * AC Voltage range - : 3Phase 400 V +/- 20% (320-480 V)
- * Nominal Frequency - : 50Hz
- * Power factor at rated power - : Unity
- * Maximum Efficiency - : 98.60%
- * Loading Factor - : 18% of rated Capacity
- * Threshold harmonic distortion (THD)- : <3% at rated power
- * Protections - : IP65 protection level for both AC and DC Side
- * Operating temperature - : -25°C to +60°C
- * Relative Humidity - : 0-100%, Non condensing
- * Built-in Energy data logger - : Provided
- * Communication Interface - : MODBUS RTU over RS 485 physical layer
- * Graphical display - : 20 X 4 LCD
- * Emergency power off(EPO) - : Yes, External switch to be connected
- * Efficiency Standards - : IEC61683:1999, : IEC 60068-2-1, IEC 60068-2-2, IEC 60068-2-14, IEC 60068-2-30,
- * Environmental testing - IEC 60068-2-6, IEC 60068-2-21, IEC 60068-2-27, IEC 60068-2-75 (As per MNRE and SECI requirement)
- * Anti-islanding protection - : VDRE-AR-N 4105; VDE 0126-1-1
- * Safety - : IEC 62109-1/2
- * Indicators -
 - 1) Inverter and Grid ON,
 - 2) Inverter over /under voltage,
 - 3) Inverter overload,
 - 4) Inverter over temperature
- * Remote Monitoring -
 - 1) DC power input
 - 2) DC input voltage
 - 3) DC input current
 - 4) AC power output
 - 5) AC voltage
 - 6) AC current
 - 7) AC frequency
 - 8) Power factor
 - 9) Energy harvested
 - 10) Inverter status
 - 11) Total power generated



1.2	Module Mounting Structure – As per Design Std. & Layout Specification – * Wind Velocity withstanding Capacity – 180 KMPH/50 m/s * Structure Material – Hot dip galvanized steel with 80 microns galvanization thickness, all structural members and washers shall be galvanized in accordance with IS:4759 * Bolts, nuts, fasteners, panel mounting clamps Stainless steel SS304 * Distance between parapet wall and mounting structure – 600 mm * Slope of Structure - 16 degree			
1.3	Junction Boxes – 50 KW X 02 Nos. Make – Nordic / Adlere / Trinity Specification – ➤ DC Junction Box - * No of inputs and outputs (50 KW Inverter) : 10 in – 10 Out * DC fuses - : 15 Amps, 1000 V * Surge protection device - : 1000V * Enclosure - :Thermoplastic polycarbonate box with transparent lid * Protection - : IP65 protection ➤ AC Junction Box - * No of inputs and outputs (50 KW Inverter)- : 1 in – 1 Out (4-Wire) * Isolation switch - : 4 pole, MCCB (50KW Inverter-125 amps & 30KW Inverter-63 amps) * Surge protection device - : 3-Phase 415 Volts * Enclosure - :Thermoplastic polycarbonate box with transparent lid * Protection - : IP65 protection			
1.4	Cables And Accessories – As Per design std. & layout. Make – Havela / KEI/Unicab/Reputed. Specification – ➤ DC Cables * Size - : Single Core 4 Sq.mm 1.5 KV grade * Type of material -: Tinned copper * Type of insulation -: XLPO * Type of outer sheath - : PVC, flame retardant and halogen free * Cable Standards - : IS 7098, IEC-60502,BS-5467 ➤ AC Cables * Size - : 3 core 95 sq.mm Al HT cable			

P.T.O.



	: 3.5 core 120 sq.mm Al 11 KV grade LT cable : 3.5 core 300 sq.mm Al 11 KV grade LT cable : Single core 6 sq.mm copper green PVC flexible earth wire : Single core 35 sq.mm flexible copper cable * Type of material - : Aluminum and copper * Type of insulation - : XLPE * Type of outer sheath - : PVC, flame retardant and halogen free * Cable Standards - : IS 7098, IEC-60502, BS-5467
1.5	Accessories – As per design std. & layout Make – Finolex / Kisan Specification – * Termination kit - : 11 KV 3 core 95 sq.mm Aluminium HT cable (indoor and outdoor type) * PVC conduit pipes - : PVC pipe- 1, ½ " heavy duty class 3 (PN), 6 kgf/ cm2. : Elbow long bend suitable for 1, ½ " PVC pipe
1.6	HT Metering Cubicle - As per design std. & layout Make – AS Per the MSEDCL Recommendation. Specification – * Current Transformer - :Voltage class : 11 KV Ratio : 30/-1-1 Amps Accuracy class : 0.2S Burden : 2.5 VA * Potential Transformer - : Voltage class : 11 KV Ratio : 11000V/110V/RT3-110V/RT3 volts Accuracy class : 0.2 Burden : 15 VA * Energy meters - : Model : ER 300 P. Make – L&T make. Voltage : 3x63.5 volts, 3 phase 4 wire, 50 Hz Accuracy class : 0.2S Impulse: 50000 impulse per kwh. Type: Bidirectional – TOD and DLMS. No of meters: 2 Nos (Main meter and Check meter)
1.7	Earthing And Protection - As per design std. & layout Make – Matrix / True Power / Ecosysm / JEF Specification – * Type - : GI flat 25x3 mm size * Earthing Material - : Earthing electrodes, chemical filled, 2 meter, 5 mm thick, 50 mm dia GI pipe with back fill compound

P.T.O.



1.8	• Earthing Resistance - ≤ 5 Ohms for each pit and ≤ 1 Ohm for grid line 1.1 Panel - As per design std. & layout Make - AS per the requirement and shall met all the latest MSFDCL/MNRE/SECI Guidelines And IEC Specification - Panel shall consist with other essentially required accessories like MCB./fuses/ITB / Glass window etc. those shall be MSFDCL guidelines/specifications. Type of fabrications/ cable termination arrangements etc. to be complied MSFDCL standards			
1.9	Main Junction Boxes - As per the requirement and shall meet all the latest MSFDCL/MNRE/SECI guidelines and IEC standards.			
1.10	Lighting & Surge Protection - As per design std. & layout Make - JEF/True Power/ECosym. Specification - • Type - : ESE type with 5 meter GI mast shall be provided to cover the building area • Protection - : As per Indian Electricity Act for safety and IEC 62305			
1.11	Module Cleaning Systems - As per design std. & layout Specification - • Modules Cleaning and Maintenance - : Water pipe line, Pump, elbow, post pipe and Electrical connection with MCB for protection			
Rs- Thirty Five Lack Twenty Five Thousand Only.		Total Rs	35,25,000=00	

• **Terms and Conditions**

1. Price of the Solar Project Work:

The price must include all the taxes applicable including GST (Goods and Service Tax) as on the date of this offer.

2. Bank Guarantee against the guaranteed performance:

The party (system provider) has to provide the Bank Guarantee of 10% of projects cost for the period of one year against specified guaranteed performance of project/system (Annexure 1).

3. The work related to Subsidy:

The party should look after the necessary things required for submission and to get the sanction of subsidy from government agency.

The scope of this work also includes obtaining approvals/ clearances from statutory authorities (ESCOM, MSFDCL/ electrical inspector/ factory inspector etc).

4. Terms for Disbursement of the Payment:

a) Thirty percent (30%) amount will be paid along with purchase order against bank guarantee.

b) Forty percent (40%) amount will be paid after receiving the material in our institute at site.

P.T.O.



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- c) Fifteen percent (15%) will be paid after installation of the project
d) Fifteen percent (15%) will be paid after successful trial of the project

5. Operation and Maintenance (O & M) cost of the system:

The scope of the O & M work will include

- a) Periodic Cleaning of the modules will be responsibility of user.
b) Periodic check of Modules, Power Conditioning Unit (Inverter/PCUs), and Balance-of-System (BoS) as a part of routine and breakdown maintenance.
c) Replacement of defective modules, PCUs etc subject to warranty/ guarantee if any and insurance.
d) Supply of spares and consumables as and when required.

6. Manufacturer's warranty -

- a. Solar PV Modules - 10 years from date of supply, against material and workmanship defect.
Power warranty: Manufacturer warrants that the module will exhibit nominal power output for 25 years as follows: 90% for a period of 12 year and 80% for a period of 25 years under STC
b. Inverter - 1 year from date of supply, against manufacturing defects
c. REL will obtain manufacturer's warranties on various components of the project for which manufacturer's warranty is available.
2. Warranty does not apply under following conditions
a. Product has been unkempt, damaged, subject to misuse, abnormal service or handling, or not maintained as per product manual
b. Any unauthorized tampering of electrical parts and connections
c. Any damage to the electrical components due to heavy fault on the load side
d. Product has been subject to abnormal environmental conditions such as acid rain or other such similar conditions, viz. unprecedented heavy winds and rains, etc.

B) Operation & maintenance for first 5 years. As already discussed & agreed -

- 1) AVCOE will provide manpower for periodic module cleaning.
2) REL will assist for technical monitoring & technical person visit schedule will be -
- Year one- First 6 month -Monthly, second 6 month -once in 2 months.
- Year two & three - Quarterly.
- Year four & five -Once in 6 months.

C) Operation and Maintenance cost of the System

O&M work will include

- o Periodic cleaning of modules.
- o Periodic check of Modules, PCUs, and BoS as a part of routine and breakdown maintenance
- o Replacement of defective modules, PCUs etc subject to warranty.

* Annual Maintenance contract will be finalise after 05 year of free services periods.

D) Remote DATA - Monitoring -

Below output from inverter will be available -

DC power input, DC input voltage, Input current, AC power output, AC voltage, AC current, AC frequency, Power factor, Energy harvested, Inverter status.

7. Project Completion Period

The system should be ready for commissioning within 90 days from the date of advance payment.

Purchase Dept.

H.O.D.

Principal

Copy to:- 01) A/C Dept. 02) H.O. D. 03) Store Dept. 04) O.C.

PUR-R-03, Rev-00, Date-03-07-2010



5. Purchase Orders of 300 kWp Solar Photo Voltaic Plant

Amrutvahini Sheti and Shikshan Vikas Sanstha's
Amrutvahini College of Engineering, Sangamner.
 P.O. Sangamner S.K. Tal-Sangamner, Dist-Anmednagar-422 608, Phone No-02425-259016 259017

:-PURCHASE ORDER:-

Order No.AE/Purchase/ Electrical Dept./ 1792 /2017-2018

Date:- 15/03/2018

To,
M.S. Ravindra Energy Limited,
 BC- 109, Davidson Road, Camp,
 Belgaum – 590 001 Karnataka, India.

Ref:-Your Quotation No. Email & Date:- 05/02/2018.

Ref:- Our Request for Quotation No. 1937 & Date:- 02/02/2018.

Dear Sir,

With reference to your above cited quotation, we hereby place our order for supplying the following goods as per the term's and conditions mentioned below. Please acknowledge receipt of the order.

Sr. No	Particulars	Quantity	Rate (Each)	Total Rs
1	300kW SRTPV System- Solar Photo Voltaic Modules Make: Vikram Solar Module Capacity - 320Wp, 72 Polycrystalline solar cells. Cell Encapsulant EVA (Ethylene Vinyl Acetate) type Module Efficiency 16.15% Superstrate High Transmission low iron tempered glass, AR coated Temperature Range - -40°C to +85°C Module Frame Anodized aluminum frame with twin wall profile, Junction Box, IP67, 3 bypass diodes, Performance Warranty, Linear power warranty for 27 years with 2.5% for 1st year degradation and 0.67% from 2 to 27 year Approvals and Certificates IEC 6125 Ed2, IEC 61730, IEC 61701, IEC 62716, CE, MCS, PV Cycle, IEC 62804	940 No's	98,00,000=00	98,00,000=00
2	Power Conditioning Unit (PCU) Make: Delta make. Inverter Maximum Input Voltage :1000 V (DC) MPPT Voltage range :520-800 V (DC) Start-Up Voltage: >250V (DC) DC/AC disconnection Switch : Provided (in- built) AC Voltage range : 3Phase 400 V +/- 20%	50KW X 6 No's		



	(320-480 V) Nominal Frequency : 50Hz Power factor at rated power : Unity Maximum Efficiency : 98.60% Loading Factor : 18% of rated Capacity Threshold harmonic distortion (THD) : <3% at rated power Protections : IP65 protection level for both AC and DC Side Operating temperature : - 25°C to +60°C Relative Humidity: 0-100%, Non condensing Built-in Energy data logger : Provided Communication Interface: MODBUS RTU over RS 485 physical layer Graphical display : 20 X 4 LCD Emergency power off(EPO) : Yes, External switch to be connected Efficiency Standards : 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 (As per MNRE and SECI requirement) Anti-islanding protection : VDRE-AR-N 4105; VDE 0126-1-1 Safety : IEC 62109-1/2 Indicators : Inverter and Grid ON Inverter over /under voltage, Inverter overload, Inverter over temperature Remote Monitoring : DC power input DC input voltage DC input current AC power output AC voltage AC current AC frequency Power factor Energy harvested Inverter status Total power generated		
3	Module Mounting Structure Wind Velocity withstanding Capacity 180 KMPH/50 m/s Structure Material Hot dip galvanized steel with 80 microns galvanization thickness, all structural members and washers shall be galvanized in	As per design std. & layout	



	accordance with IS:4759 Bolts, nuts, fasteners, panel mounting clamps Stainless steel SS304 Distance between parapet wall and mounting structure 600 mm Slope of Structure 16 degree			
4	Junction Boxes Make: Nordic/Adlere/Trinity DC Junction Box No of inputs and outputs (50 KW Inverter) : 10 in – 10 Out And 6 in - 6 Out As Per Selection of inverter DC fuses : 15 Amps, 1000 V Surge protection device : 1000V Enclosure :Thermoplastic polycarbonate box with transparent lid Protection : IP65 protection AC Junction Box No of inputs and outputs (50 KW Inverter) : 1 in – 1 Out (4-Wire) Isolation switch : 4 pole, MCCB (50KW Inverter-125 amp. Surge protection device : 3-Phase 415 Volts Enclosure :Thermoplastic polycarbonate box with transparent lid Protection : IP65 protection	50KW X 6No's		
5	Cables and Accessories Make: Havells DC Cables Size : Single Core 4 Sq.mm 1.5 KV grade Type of material : Tinned copper Type of insulation : XLPO Type of outer sheath : PVC, flame retardant and halogen free Cable Standards : IS 7098, IEC-60502,BS- 5467 AC Cables Size : 3.5 core 95 sq.mm Al HT Armoured cable ; 3.5 core 120 sq.mm Al 1.1 KV grade LT Armoured cable; 3.5 core 300 sq.mm Al 1.1 KV grade LT Armoured cable ; Single core 6 sq.mm copper green PVC flexible earth wire ; Single core 35 sq.mm flexible copper cable Type of material : Aluminum and copper as per string design Type of insulation : XLPE	As per design std. & layout		

	Type of outer sheath : PVC, flame retardant and halogen free Cable Standards : IS 7098, IEC-60502, BS-5467			
6	Accessories (As per design standard and layout) Make: Finolex : 1.1 KV 3.5 core 95 sq.mm Aluminum HT cable (indoor and outdoor type) PVC conduit pipes : PVC pipe- 1.½ " heavy duty class 3 (PN), 6 kgf/cm ² (UPVC) : Elbow long bend suitable for 1.½ " UPVC pipe			
7	HT Metering Cubicle As per the MSEDCL recommendation Current Transformer : Voltage class : 11 KV Ratio : 30/-1-1 Amps Accuracy class : 0.2S Burden : 2.5 VA Potential Transformer : Voltage class : 11 KV Ratio : 11000V/110V/RT3-110V/RT3 volts Accuracy class : 0.2 Burden : 15 VA Energy meters : Model : ER 300 P Voltage : 3x63.5 volts, 3 phase 4 wire, 50 Hz Accuracy class : 0.2S Impulse: 50000 impulse per kwh. Type: Bidirectional - TOD and DLMS. No of meters: 2 Nos (Main meter and Check meter)	As per design std. & layout		
8	Earthing and Protection Make: Matrix/True Power/Ecosysm/JEF Type : GI flat 25x3 mm size Earthing Material : Earthing electrodes, chemical filled, 2 meter, 5 mm thick, 50 mm dia GI pipe with back fill compound Earthing Resistance : < 5 Ohms for each pit and <1 Ohm for grid line	As per design std. & layout		
9	LT Panel As per MSEDCL/MNRE/SECI guidelines and IEC Standards Powder coated Panel shall consist with other essentially required accessories like LT panel should consist of required busbar chamber ACB / MCCB, necessary meters required cables/wires and CT & PT. MCB/fuses/TTB / Glass window etc. those shall be MSEDCL guidelines specifications	As per design std. & layout		



	Type of fabrications/ cable termination arrangements etc. to be complied MSEDCL standards			
10	Main Junction Boxes As per the requirement and shall meet all the latest MSEDCL/MNRE/SECI guidelines and IEC standards	As per std.		
11	Lightning & Surge Protection Type Make: JEF/True power/Ecosym : ESE type with 5 meter GI mast shall be provided to cover the building area Protection : As per Indian Electricity Act for safety and IEC 62305	As per design std. & layout		
12	Module cleaning system Modules Cleaning and Maintenance : Water pipe line, Pump capacity must be suitable for water sprinkler system to cover all solar panels, starter, elbow, post pipe and Electrical connection with MCB for protection Suitable water sprinkler system is recommended UPVC pipe should be suitable for high pressure UPVC type to clean PV modules	As per design std. & layout		
13	Monitoring system SCADA system SCADA should be compatible for 400kwp plant & wireless connectivity for online remote monitoring system to cover all parameters. CCTV Camera outdoor CCTV camera 10X Hikuzen cat 6 D-Link make cable 05mega pixel Bullet camera Ethernet Cable Ethernet Cable - Cable sheath diameter (ϕ) 2 x 5 to 7 mm, Cable type STP cable (Shielded Twisted Pair, CAT 6 Cable D-Link make characteristic impedance - 100 Ω to 120 Ω RJ45 connector RJ45 connector: RJ45 for Ethernet (Metallic Wire size 24 to 26 AWG (depending on design of the RJ45 plug) Cable shield termination Via RJ45 plug Unmanaged Ethernet Switch Unmanaged Ethernet Switch 100/1000 Industrial grade 8 ports switch RMU	6 No Camera As per design std. & layout		



	Central communication unit for at maximum 30 PV/50kW/33kW Inverters, integrated modbus interface, interface for compatible weather stations and external I/O module			
	Rs-Ninety Eight Lacks only.		Total Rs-	98,00,000-00

Terms and Conditions:

1. Price of the Solar Project Work:

The price must include all the taxes applicable including GST (Goods and Service Tax) as on the date of this offer.

2. Bank Guarantee against the guaranteed performance:

The party (system provider) has to provide the Bank Guarantee of 10% of project cost for the period of one year against specified guaranteed performance of project/system (Annexure 1).

3. The work related to Subsidy:

The party should look after the necessary things required for submission and to get the sanction of subsidy from government agency.

The scope of this work also includes obtaining approvals/ clearance from statutory authorities (ESCOM, MSEDCL-Regional, Divisional and Sub-divisional office etc./ electrical inspector/ factory inspector etc).

4. Terms for Disbursement of the Payment:

- Thirty percent (30%) amount will be paid along with purchase order against bank guarantee.
- Forty percent (40%) amount will be paid after receiving the material at site in our institute.
- Fifteen percent (15%) will be paid after installation of the project.
- Fifteen percent (15%) will be paid after successful trial of the project.

5. Operation and Maintenance (O &M) cost of the system:

The scope of the O &M work will include:

- Periodic Cleaning of the modules will be the responsibility of user.
- Periodic check of Modules, Power Conditioning Unit (Inverter/PCUs), and Balance-of-System (BoS) as a part of routine and breakdown maintenance.
- Replacement of defective modules, PCUs etc. subject to warranty/guarantee if any and insurance.
- Supply of spares and consumables as and when required.

6. Manufacturer's warranty:

A)

- Solar PV Modules – 10 years from date of supply against material and workmanship defect. Power warranty: Manufacturer warrants that the module will exhibit nominal power output for 25 years as follows; 90% for a period of 12 year and 80% for a period of 25 years under STC.
- Inverter – 1 year from date of supply against manufacturing defects.
- REL (Ravindra Energy Limited) will obtain manufacturer's warranties on various components of the project for which manufacturer's warranty is available.

B) Operation & maintenance for first 5 years (As already discussed & agreed) –

- AVCOE will provide manpower for periodic cleaning of modules.
- REL will assist for technical monitoring & technical person visit schedule will be-
Year one: a) First 6 month –Monthly b) Second 6 month – Once in 2 month.
Year two & three:- Quarterly.
Year four & five:- Once in 6 month.
- Incase of emergency REL Should send service engineer immediately.



C) Operation and Maintenance cost of the System

O&M work will include:

- Periodic cleaning of modules.
- Periodic check of Modules, PCUs, and BoS as a part of routine and breakdown maintenance.
- Replacement of defective modules, PCUs etc. subject to warranty.

* Annual Maintenance contract will be finalized after 05 year of free service period.

D) Remote DATA – Monitoring:

Below output from inverter will be available-S

DC power input, DC input voltage, Input current, AC power output, AC voltage, AC current, AC frequency, Power factor, Energy harvested, Inverter status.

7. Project Completion Period

The project system should be ready for commissioning within **60** days from the date of issue of purchase order. If not followed then penalty of Rs. 5000/Day will be charged. The penalty amount will be deducted from the final bill payment.

8. The curing of concrete related activity should be executed properly (i.e. purchasing of jute gunny bags and should be kept covered the concrete elements in wet condition round the clock for at least 28 days.)

9. The party has to submit the project execution cum completion schedule (i.e. Bar chart and or Gantt chart showing the various activities along with time duration for its completion - independent/dependent/concurrent).

10. The party should submit the detailed analysis of payback period for the project.

11. The party should submit the test certificate and / or report from competent authority at the time of sending the material (equipment/machinery) at site.

12. The party should give the detailed drawing (structural plan, elevation, section, index map, layout) & specifications of Civil work and Electrical work required for completion of the project at the time of commencement of the project.

13. There will be agreement between both the parties for 300KW SRTPV Project (the system provider and owner).

14. Any accident/injury caused to you as your labour during completion of project, which will be your sole responsibility.

15. After installation of the project while injecting the solar power into our existing systems if anything goes wrong due to your mistakes then it will be your sole responsibility.


Purchase Dept.


H.O.D.


Principal

Copy to:- 01) A/C Dept. 02) H.O. D. 03) Store Dept. 04) O.C.

PUR-R-03, Rev:00, Date-15/06/2017



6. Purchase Order of 5kW Solar-Wind Hybrid Plant:

Amrutvahini Sheti And Shikshan Vikas Sanstha's
Amrutvahini College Of Engineering Ghulewadi, Sangamner.
P.O.Sangamner S.K. Tal-Sangamner, Dist-Ahmednagar-422 608, Phone No- 02425- 259016/259017

:-PURCHASE ORDER:-

Order No.AE/Purchase/ Electrical Dept. / **1015** /2013-2014 Date: - 05/ 10/2013
To,
M/S:- Saidip Enterprises,
K.G. Road, A/P. Tal – Akole,
Dist – Ahmednagar.

Ref:-Your Quotation No. SE/WS/35/2013-014 & Date:- 05/10/2013
Ref:-Our Enquiry No. --- & Date:- 02/07/2013

Dear Sir,

With reference to your above cited quotation. We are pleased to place our order for supplying the following goods as per the term and conditions mentioned below. Please acknowledge receipt of the order.

Sr.No	Particulars	Quantity	Rate	Total Rs
1.	5kW Hybrid Solar Wind Energy system – Including Following Specifications- 1) Wind electric generator – 3.2kW, Unitron make 2) Solar Panel – 1.8kW, mono/ multy crystalline solar PV-panel of 'A' grade rating company. Make – Emmvee make 3) Inverters capacity – 5kVA /96V, pure sine wave. – 01 No.Make – Emerson make 4) Battery –400AH @96V, VRLA GEL battery bank – 48 cell. 5) Tower Height – 60ft. (as per requirement) Control pannel of solar system & wind system should consist of Voltmeter, Ammeter, and Frequency meter separately as well as main output control panel (Inventor output) should consist of Voltmeter, Ammeter. Electronics frequency meter, energy meter and power factor meter as per the rated capacity & design. There should be provision of measuring turbine speed by tachometer and wind velocity with the help of Anemometer. The entire meter should be AE make. There should be provision of change over switch of rated capacity to synchronies with the grid. Necessary required cables, wires should be provided by you only. Make – polycab/finolex make Rs – Twelve Lack Only.	01 Set.	12,00,000-00	12,00,000-00
			Total Rs	12,00,000-00

Terms & Conditions:-
01) Delivery: - Our College site at your cost.
02) Delivery Period- Before – 04 to 06 week.
03) Sales tax: - All taxes including in price.
04) Payment – 80% after receipt & approval of material against delivery & remaining 20% after successful Installations, testing and commissing and also traing to our staff by cheque only. Non – refundable processing fee of Rs. 5000/- (Five Thousand Only) should be paid along with the P.O.

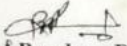
P.T.O.

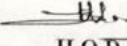
Scanned by CamScanner



Amrutvahini College of Engineering, Sangamner

- 06) Any accident / injury caused to you or your labour while working on our site will be your sole responsibility.
- 07) Subsidy of Rs. 5,00,000/- (Five Lack Only) to be paid by you within 01 year from government or your self to the college & registered bond of Rs. 100/- to be submitted in this respect to college. Preparations of proposal for MNRA subsidy sanction is your own responsibility.
- 08) Warranty / Garranty – Wind generator along with balance of systems carry an extended warranty for two year. Solar panels – 10 years. Inverter & battery – 5 year warranty.


Purchase Dept.


H.O.D.


Principal

Copy to:- 01) A/C Dept. 02) H.O. D. 03) Store Dept. 04) O.C.

PUR-R-03, Rev:00, Date-03-07-2010

7. Amrutvahini Sanstha Policy Document for Solar Energy:

सोसायटी रजि.अंक १८६०
र.नं. महा/३१७/अ.नगर/७८ ता.८-८-७८

मुंबई पब्लीक ट्रस्ट अंक ११५०
रजि.नं.२७४ (अ.नगर) ता.३०-११-७८

अमृतवाहिनी शेती व शिक्षण विकास संस्था. अमृतनगर, संगमनेर
पो.संगमनेर एल.के. ४२२६०८, ता.संगमनेर, जि.अहमदनगर
फोन : (०२४२५) २५९०९४, २५९०९७, २५९०९८ फॅक्स : ०२४२५ - २५९०९६
web : www.avssvsanstha.org

जा.नं. संस्था/पर्सो/२०१७-१८/ ४२४ दिनांक- १७/११/२०१७.

कार्यालयीन आदेश

अमृतवाहिनी शेती व शिक्षण विकास संस्थेने उच्च दाख क्षमतेचे ग्राहक क्र. १५५०४९००४०९९नुसार विद्युत कनेक्शन महावितरण कडून दैनंदिन वापरासाठी घेतलेले आहे. सदर विद्युत कनेक्शनचा वापर संस्था संचालित अमृतवाहिनी अभियांत्रिकी महाविद्यालय, अमृतवाहिनी तंत्रनिकेतन, अमृतवाहिनी औद्योगिक प्रशिक्षण संस्था यांच्यासाठी एकत्रितरित्या केला जात आहे. सदर कनेक्शनचे विद्युत बिल एकत्रित येत असून व्यवस्थापनाने त्याची विभागणी खालील प्रमाणे केलेली आहे.

अ. नं.	महाविद्यालयाचे नाव	१००% बिलाचे वाटप योजनेप्रमाणे भरावयाची रक्कम
०१.	अमृतवाहिनी अभियांत्रिकी महाविद्यालय	४०%
०२.	अमृतवाहिनी तंत्रनिकेतन	१२%
०३.	अमृतवाहिनी औद्योगिक प्रशिक्षण संस्था	२.५%
०४.	अमृतवाहिनी शेती व शिक्षण विकास संस्था	४५.५%

तरी सर्व संस्था प्रमुखांनी उपरोक्त विभागणीनुसार विद्युत बिलाची रक्कम मुख्य संस्था कार्यालयामध्ये मुदतीत अदा करावी.

ABYhinde
अनिल बी.शिंदे
मुख्य कार्यकारी अधिकारी
अमृतवाहिनी शेती व शिक्षण विकास संस्था,
अमृतनगर, संगमनेर

प्रत माहितीस्तव व कार्यवाहिस्तव :

१. प्राचार्य- अमृतवाहिनी अभियांत्रिकी,
२. प्राचार्य- अमृतवाहिनी तंत्रनिकेतन,
३. प्राचार्य- अमृतवाहिनी आय.टी.आय.,
४. रजिस्ट्रार,
५. इलेक्ट्रिकल मॅन्टेनन्स विभाग,
६. मा.फा.