



Government Woman Engineering College, Ajmer, Makhapura, Nasirabad
Road, Ajmer -305002

INVITATION LETTER

Package Code: TEQIP-III/2019/RJ/gwec/81

Current Date: 05-Jun-2019

Package Name: GWECA/EEE/Research Lab (NCE)

Method: Shopping Goods

To,

Sub: INVITATION LETTER FOR GWECA/EEE/Research Lab (NCE)

Dear Sir,

1. You are invited to submit your most competitive quotation for the following goods with item wise detailed specifications given at Annexure I,

Sr. No	Item Name	Quantity	Place of Delivery	Installation Requirement (if any)
1	Solar Photo Voltaic (Generation and Measurement)	1	GWEC Ajmer	
2	Wind Energy System Concepts	1	GWEC Ajmer	

2. Government of India has received a credit from the International Development Association (IDA) towards the cost of the **Technical Education Quality Improvement Programme [TEQIP]-Phase III** Project and intends to apply part of the proceeds of this credit to eligible payments under the contract for which this invitation for quotations is issued.

3. **Quotation**

- 3.1 The contract shall be for the full quantity as described above.
- 3.2 Corrections, if any, shall be made by crossing out, initialling, dating and re writing.
- 3.3 All duties and other levies payable by the supplier under the contract shall be included in the unit Price.
- 3.4 Applicable taxes shall be quoted separately for all items.
- 3.5 The prices quoted by the bidder shall be fixed for the duration of the contract and

shall not be subject to adjustment on any account.

- 3.6 The Prices should be quoted in Indian Rupees only.
4. Each bidder shall submit only one quotation.
5. Quotation shall remain valid for a period not less than **90**days after the last date of quotation submission.
6. Evaluation of Quotations: The Purchaser will evaluate and compare the quotations determined to be Substantially responsive i.e. which
- 6.1 are properly signed; and
- 6.2 Confirm to the terms and conditions, and specifications.
7. The Quotations would be evaluated for all items together.
8. Award of contract The Purchaser will award the contract to the bidder whose quotation has been determined to be substantially responsive and who has offered the lowest evaluated quotation price.
- 8.1 Notwithstanding the above, the Purchaser reserves the right to accept or reject any quotations and to cancel the bidding process and reject all quotations at any time prior to the award of Contract.
- 8.2 The bidder whose bid is accepted will be notified of the award of contract by the Purchaser prior to expiration of the quotation validity period. The terms of the accepted offer shall be Incorporated in the purchase order.
9. Payment shall be made in Indian Rupees as follows:
- Satisfactory Acceptance - 10% of total cost**
Delivery and Installation - 90% of total cost
10. Liquidated Damages will be applied as per the below:
Liquidated Damages Per Day Min % :N/A
Liquidated Damages Max % : N/A
11. All supplied items are under warranty of **36** months from the date of successful acceptance of items and AMC/Others is .
12. You are requested to provide your offer latest by **15:00** hours on **19-Jun-2019**.
13. Detailed specifications of the items are at Annexure I.
14. Training Clause (if any) **required**
15. Testing/Installation Clause (if any) **Required**

16. Performance Security shall be applicable: **5%**
17. Information brochures/ Product catalogue, if any must be accompanied with the quotation clearly indicating the model quoted for.
18. Sealed quotation to be submitted/ delivered at the address mentioned below,
**Government Woman Engineering College, Ajmer, Makhupura, Nasirabad Road,
Ajmer -305002**
19. We look forward to receiving your quotation and thank you for your interest in this project.
20. You are requested to provide the company details viz. **Firm Registration Certificate, GST Registration Certificate** and any other necessary documents **duly certified by Chartered Accountant and Notary Public.**

(Authorized Signatory)

Name & Designation

Annexure I

Sr. No	Item Name	Specifications	Rating (approx.)
1	Solar Photo Voltaic (Generation and Measurement)	<p>(i) Solar PV Stand-Alone System Concepts</p> <p>PV characteristics</p> <ul style="list-style-type: none"> • Single PV module I-V and P-V characteristics with radiation and temperature changing effect. • I-V and P-V characteristics with series and parallel combination of modules. • Effect of shading. • Effect of tilt angle. • Demonstration of bypass and blocking diode. <p>Stand alone system</p> <ul style="list-style-type: none"> • Battery charging and discharging characteristics. • Demo of system using DC load with battery,(with variable rated capacity of system). • Demo of system using AC load with battery. • Combine AC and DC load system with battery. <p>Maximum Power Point Tracking</p> <ul style="list-style-type: none"> • Finding MPP by varying the resistive load across the PV panel. • Finding MPP by varying the duty cycle of DC-DC converter. • Using MPPT algorithm find the V_{mx}, I_{mx} and P_{max} and duty cycle at which MPP occurs. • Perform the experiment (3) with different values of perturbation (ΔD). Observe the response of P_{max} with the P_{max} observed in exp -3. • Perform the experiment no 1 to no 4, with battery in the circuit. 	<p>Power Generating Unit:</p> <ul style="list-style-type: none"> • PV Modules - 74Wp • Artificial Source of Radiation - 900W/m² • Radiation Intensity Regulator – Yes • Manual Tracking – Yes <p>Power Conditioning Unit:</p> <ul style="list-style-type: none"> • DC-DC Converter - Automatic/User-Defined • Inverter - Automatic/User-Defined • Potmeter – Yes • Voltmeter - AC/DC • Ammeter - AC/DC • Temperature Meter – Yes <p>Data Logger and Plotter Accessories:</p> <ul style="list-style-type: none"> • Radiation Meter – Yes • Connecting Wires - Yes • Shading Elements- Yes • Experimental Manual- Yes

Inverter

- Observe the output voltage waveform of inverter in auto mode.
- Observe the output voltage with manual control.
 - 180 degree control
 - 120 degree control.

Observe the RMS value and waveform of output voltage with both 180 and 120 degree control.

(ii) Solar PV Grid – Tied Concepts

List of Experiments:

1. Theoretical Study of various components of complete system
2. Set up for virtual grid and comparison with actual grid in terms of voltage regulation and THD at PCC
3. Observation of current for linear & nonlinear loads and voltage waveform at PCC
4. Power factor improvement using capacitor bank and its impact on power quality at PCC
5. Synchronization of grid tied inverter, observation of current waveform and calculations for distortion, displacement and power factor of grid tied inverter
6. Evaluation of the active, reactive power and net energy flow between grid tied inverter, artificial grid & load
7. Demonstration of Islanding protection for sudden failure of grid

(iii) Solar PV Emulation

Research Insights

- MPPT algorithm testing
- Inverter control testing for different operating conditions
- Analysis and characterization of solar stand alone PV system
- Analysis and characterization of grid

Power Generating Unit:

- PV Modules - 460 Wp
- Grid – Tied Inverter – Yes
- Voltmeter AC/DC
- Ammeter - AC/DC
- Power Analyzers – yes

Artificial Grid Unit:

- Stand Alone Inverter – Yes
- Battery Bank – Yes

Accessories:

- Radiation Meter – Yes
- Connecting Wires – Yes

Power Supplies – 4

- Max. Power - 300 W
- V_{oc} Max – 50 V
- I_{sc} Max – 8 A
- Remote Programming – 8A
- Data Logger and Plotter – Yes
- Variable Temperature Control – Yes
- Variable Radiation Control – Yes

		<p>connected system</p> <ul style="list-style-type: none"> • Micro-grid and smart grid control testing 	
2	Wind Energy System Concepts	<p>List of Experiments</p> <ul style="list-style-type: none"> • Evaluation of cut-in speed and cut-off speed • I-V characteristics of wind turbine at different wind speed • Characteristics of wind turbine with electrolysis and water pump • P, V and F measurement of output of wind generator • Demonstration of system with charge controller and inverter • Power quality of AC output of system. Impact of load and wind speed on power output and its quality 	<p>Power Generating Unit:</p> <ul style="list-style-type: none"> • Artificial Wind Generation Unit – Yes • Wind Turbine - 200 W, 11m/s, 24V <p>Power Conditioning Unit</p> <ul style="list-style-type: none"> • DC-DC Converter – Yes • Inverter – Yes • Battery Bank – Yes • Voltmeter AC/DC • Ammeter - AC/DC • Power Analyzer –Yes

FORMAT FOR QUOTATION SUBMISSION

(In letterhead of the supplier with seal)

Date: _____

To: _____

Sl. No.	Description of goods \ (with full Specifications)	Qty.	Unit	Quoted Unit rate in Rs. (Including Ex-Factory price, excise duty, packing and forwarding, transportation, insurance, other local costs incidental to delivery and warranty/ guaranty commitments)	Total Price (A)	Sales tax and other taxes payable	
						In %	In figures (B)
Total Cost							

Gross Total Cost (A+B): Rs. _____

We agree to supply the above goods in accordance with the technical specifications for a total contract price of Rs. _____ (Amount in figures) (Rupees _____ amount in words) within the period specified in the Invitation for Quotations.

We confirm that the normal commercial warranty/ guarantee of _____ months shall apply to the offered items and we also confirm to agree with terms and conditions as mentioned in the Invitation Letter.

We hereby certify that we have taken steps to ensure that no person acting for us or on our behalf will engage in bribery.

Signature of Supplier

Name: _____

Address: _____

Contact No. _____