MEGHALAYA NON-CONVENTIONAL AND RURAL ENERGY DEVELOPMENT AGENCY

Near BSF Camp Mawpat, Shillong-793012.
Phone No.0364-2537343/2536138## Fax No.0364-2537611
E-Mail mnreda_shg @ bsnl.in ## Website www.mnreda.Gov.in

TENDER DOCUMENT

1.	WORK NO.	:	MNREDA/1417/2010/9
2.	Name of Work	:	Design, Supply, Installation and Commissioning of 13 Nos.of 10 Kw Solar Wind Hybrid at different sites in Meghalaya.
3.	Date of Issue of Tender Document	:	25.10.2010 to 19.11.2010
4.	Date of submission of Tender	:	22.11.2010 at 12.00 hours
5.	Date of Opening of Tender for Commercial Terms and Technical Bid	:	22.11.2010 at 13.00 hours.

6. Tender Issue to_____ against application vide letter NO._____dated_____ against payment of Rs. 5,000/- (Rupees Five thousand) only vide Demand Draft/Bankers Cheque No./Cash_____dated_____of Bank towards cost of Tender Documents (Non-refundable).

PART – A

GENERAL TERMS AND CONDITIONS AND SCOPE OF WORK WITH TECHNICAL SPECIFICATION

(Page 1 to 22)

Issued by :_____

FOR MEMBER SECRETARY CUM DIRECTOR,
MEGHALAYA NON CONVENTIONAL AND
RURAL ENERGY DEVELOPMENT AGENCY,
SHILLONG.

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1. **SHORT NOTICE INVITING TENDER**

NO. MNREDA/1417/2010/9 : Sealed Tender with 90 (Ninety) days validity from any Approved Manufacturer or Supplier recognized by the Govt. of India, Ministry of New and Renewable Energy to undertake the below mentioned work.

1.	Name of Work	:	Design, Supply, Installation and Commissioning of 13 Nos. of 10 KW Solar Wind Hybrid at different sites in Meghalaya.
2.	Cost of Tender	:	Rs. 5,000/-(Rupees Five thousand) only
3.	Date of Issue of Tender	:	25.10.10 to 19.11.2010
4.	Date of Submission	:	22.11.10 at 12:00 hours.
5.	Date of Open of Tender for Commercial Bid & Technical Bid	:	22.11.10 at 13:00 hours

INSTRUCTION :

i) Cost of Tender paper or document should be in the form of Cash/Banker's Cheque/Demand Draft (Non-refundable) drawn in favour of Member Secretary-Cum Director, Meghalaya Non-Conventional and Rural Energy Development Agency, Shillong.

ii). Tender paper/document will be issued by Courier/Speed Post on request but extra payment of Rs. 200/- (Rupees Two hundred) only should be made by Demand Draft in favour of the undersigned towards cost of speed post/courier.

iii). In the event of postal delayed, the undersigned shall not be held responsible.

iv) Tender paper/document shall be issued on any working day within the specified date.

v) Tender can be downloaded from the website, but while submitting of Tender-Tender cost should be deposited.

Member Secretary-Cum Director,
Meghalaya Non Conventional and
Rural Energy Development Agency,
Shillong.

Memo NO.MNREDA/1417/2010/9 (a) Dated Shillong, the 12th October, 2010.

Copy to:

1. The Additional Chief Secretary,
   to the Govt. of Meghalaya
   Power Department.

2. Shri Dilip Nigam,
   Scientist (F),
   Ministry of New and Renewable Energy,
   Block No. 14, C.G.O. Complex,
   Lodi Road, New Delhi-110003.

3. Rajashi S. Choudhury,
   Assistant Manager,
   The Indian Express Ltd.,
   23, Dr. S.K. Bhuyan Road,
   Dighali Pukhuri (East),
   Guwahati-781001,
   E-mail express.ne@gmail.com

   With a request to publish in one issue of Financial Express All Editions. Mum/Del/ Jol/Chen/Kochi/Bgl/Hyd/Pun/Chd/Ahd(Guj)/ Eng and to be submit a bill in duplicate alongwith all sample of advertisement of all editions for necessary payment.

4. The Directorate Information &
   Public Relation Department,
   Meghalaya, Shillong.

5. The State Informatic Officer,
   National Informatic Centre,
   Meghalaya, Shillong.

   With a request to display the NIT on the website enclosed herewith both hard copy and soft copy.

6. Notice Board.

Sd/-
Director.

2.0 **Instruction to Tenderer** :

2.1 **Site Location :**

Sl. No.	Site	Block	District	Capacity
1.	Department of Fisheries Sohra.	Shella Bholaganj	East Khasi Hills	10 Kw (60% Wind and 40% Solar))
2.	Indian Institute of Management Mawdiangdiang	Mawryngkneng	East Khasi Hills	10 Kw (60% Wind and 40% Solar))
3.	Sub-Division and Office(Civil) Sohra.	Shella Bholaganj	East Khasi Hills	10 Kw (60% Wind and 40% Solar))
4.	K.J.P. Assembly Orphanage Boy's Home Mawphlang	Mawphlang	East Khasi Hills	-do-
5.	Tongsang Village Khliehriat	Khliehriat	Jaintia Hills	-do-
6.	Sai-Mica Park Sohra	Shella Bholaganj	East Khasi Hills	-do-
7.	Sangbangla Private Resort Nongpoh.	Umling	Ri-Bhoi	-do-
8.	Sub-Division AH & Veteranary Wah Khlak Khlak Sohra.	Shella Bholaganj	East Khasi Hills	-do-
9.	Bethany Society Laitumkhrah, Shillong.	Mylliem	East Khasi Hills	-do-
10.	Ialong Tourism Jalang Village	Thadlaskein	Jaintia Hills	-do-
11.	North Eastern Hills University Mawlai, Shillong.	Mylliem	East Khasi Hills	-do-
12.	Piggery Farm A & H Deptt. Sohra.	Shella Bholaganj	East Khasi Hills	-do-
13.	Lyngkien Sustanable Development Group Laitlyngkot.	Laitkhroh	East Khasi Hills	-do-

2.2 The Cost of Tender papers or document should be in the form of Cash/Bankers Cheque No/Demand Draft (Non-refundable) drawn in favour of Member Secretary, Meghalaya Non Conventional and Rural Energy Development Agency, Shillong.

2.3 Tender document will be issued by Courier or Speed Post on request but extra payment of Rs.200/-(Rupees two hundred) only should be made by Demand Draft towards cost of Speed Post or Courier.

2.4 Local dealer of any manufacturer or supplier will be issue Tender document but on furnishing of their dealership Certificate and Tender document will be issued in Principal's name.

2.5 In the event of postal delayed, MNREDA shall not be held responsible.

2.6 Tender document will be issued on any working days within the specified date

2.7 In case the opening date is declared as holiday Tender shall be open in the next working day at the same time and hour.

2.8 Tenderers can submit the Tender by down loading from the website but cost of Tender document has to be furnished before casting of Tender.

2.9 Tenderer are to furnish their offer in two seal cover envelope. 1st Envelope marked as "COMMERCIAL AND TECHNICAL BID" should enclosed along with. Part A of Tender documents issued in original. And 2nd envelope marked as "FINANCIAL BID" should contain Part-B of Tender issued in original.

(a)"**Technical Bid**" : List of the Empanelment letter issued from the concern authority for qualification to tender the bid.

(b)"**Financial Bid**" should contain only EMD and the Price bid quoted on the tender document as supplied by the Agency or in a separate sheet but as per format supplied.

2.10 Commercial Terms and Conditions specifically indicating deviations to the terms and conditions stipulated in detailed tender papers including payment terms etc. must be clearly specify the deviation.

2.11 Basis price quoted- The price quoted should be Firm and as per the format provided in the tender document. Price break up of various components must be clearly indicated in the format, failing to comply to the above will result in cancellation or rejection of the tender.

2.12 Any other particular information, which are required to be furnished as per detailed tender papers but which have not been specifically indicated.

2.13 The rate should be legible written in English both in figure and in words. In case of any dispute between the figure and words the letter shall be indicated.

2.14 Date of opening of Financial Bid shall be intimated individually to those firm who is qualified for Commercial and Technical offer.

2.15 The Price Bid/offer of all other who are not qualified for Technical Bid shall be returned unopened to such parties under acknowledgement. For other who qualify for Technical Bid due information shall be given through either **Phone or Fax.**

2.15.1 Earnest Money Deposit of 1% for Schedule Tribe and Scheduled Caste and backward classes and 2% for general on the amount quoted in the form of Bank Guarantee/Call Deposit/FDR from any Scheduled or Nationalized bank of India pledged in favour of Director, MNREDA, Shillong should be furnished without which Tenders will be rejected.

3. **General/Commercial terms and Conditions:**

3.1 **Signing of Tender Paper** : The Tender Document as issued by MNREDA should be sealed and signed by the Authorized person of the firm and it will be view as acceptance of each and every conditions containing therein.

3.2 **Attestation**: All xerox supporting papers which is not original should be duly attested by the Government official not below the rank of Magistrate.

3.3 **VAT**: VAT Registration and VAT Clearance Certificate upto March, 2010 should be furnished alongwith the Bid.

3.4 Time of Completion: The work should be completed within 120 days from the date of issue of final work order i.e. @ Supply of System to the respective site should be completed within 60 (sixty) days from the date of issue of final work order, (b) Installation and Commissioning of System should be completed within 60 days from the date of received of material at sites or designated Centre.

3.5 **Supplier:** The Supplier who are not the Module manufacturer are required to produce a letter from the manufacturer of Module for commitment of supplying the Module without which offer will be rejected.

3.6 **Trading License**: The successful bidder has to produce a Trading License from the proper authority before starting of work at sites.

3.7 **Agreement:** An Agreement has to be signed within 7 (seven) days of issue of final work order. The Agreement shall be prepared by the purchaser on a stamp paper duly signed by the authorize person of the Firm and Purchaser. The Tender Document as issued alongwith the Bid as submitted by the bidders alongwith supporting papers shall be part and parcel of the agreement. The maintenance contract agreement shall be separately signed on completion of installation and commissioning work of the system.

3.8 **Division of Work**: The work may be allotted to more than one party so as to enable to complete the work within the set target date by the Government of India, MNRE.

3.9 **Warranty**: The System supplied should be guarantee for a period of 2 years and after Warranty period an Annual Maintenance Contract has to be undertaken for 3 years after warranty period.

3.10 **Empanelment** :- The tenderer are required to furnish the empanelment letter issued by C-WET Chennai/MNRE.

3.11 **Payment Terms and Conditions**: The Bidders shall be entitled to the following payment terms.

(a) Mobilization Advance: The contractor shall be paid 30% (thirty percent) of value as mobilization advance against a Bank Guarantee of equivalent /like amount from any Nationalized Bank or Scheduled valid for a period of 120(one hundred twenty) days from the date of acceptance of work.

(b) 40% (forty percent) of the contract value of the plant/equipment shall be paid against receipt of materials at site in good conditions.

(c) 20% (twenty percent) of the contract value of the plant/equipment shall be paid on complete Installation and Commissioning.

(d) Balance 10% (ten percent) to be paid at the end of 2 (two) years of warranty period or against submission of Bank Guarantee of equivalent /like amount valid for a period of two years from the date of Commissioning.

(e) The Annual/comprehensive maintenance contract payment shall be made on percentage of 30%, 30% and 40% at the end of 3^{rd}, 4^{th} and 5^{th} years basis.

In the event of contractor not being able to supply or to carry out the work or a part of the work assigned to him in accordance with the terms of this contract, the purchaser shall have the right to recover any sums advanced form the contractor from his/its assets/amount submitted as mobilization advance.

3.12 W**rite-up of System**: The write-up in English about the System functioning alongwith Block Diagram of Installation of the System should be furnished along with the Bid.

3.13 **Experience**: The bidders are required to submit the detailed experience during the last 3 years of the work completed of the same system. A Statement in this respect has to be compiled in a comprehensive form alongwith work orders and completion Certificate. Due weightage will be given or considered to the bidders who have any experience especially in North Eastern Region and hilly areas.

3.14 **Subletting of Contract**: The Contractor shall not without the prior consent in writing of the Purchaser, assign or sublet or transfer his contract, or a substantial part thereof other than raw materials or for any part of the work of which makers are named in the contract provided that any such consent shall not relieved the contractor from any obligation duty or responsibility under the contract.

3.15 **Price Quoted**: The price quoted as per the bidding Scheduled i.e. cost of the System, Transportation, Installation and Commissioning and maintenance contract should be realistic and practical in nature and conform to the actual work to be done. Any figure which is not practically practicable, offer will be rejected.

3.16 **Contractor to Inform Himself fully**:

(a) The Contractor shall be deemed to have carefully examined the general conditions, specification and Schedules and also to have satisfied himself as to the nature and character of the plant and equipment to be supplied and installed under the contract, the site conditions and all relevant matter and detailed.

(b) If he shall have any doubt as to the meaning of any portion of the contract/work order, he shall before signing/accepting it, set forth the particulars thereof and submit them to the Engineer-in-charge in writing in order to remove such doubts.

3.17 **Financial Soundness**: Documentary evidence in support of Financial Soundness of the Tenderer should be furnished.

3.18 **Submission of Bids**:

(a) **Commercial & Technical Bid should contains the following:**

(i) Tender paper (Part –'A') as issued by the Agency duly signed and seal by the Authorized persons of the firm.

(ii) Empanelment letter from Authorized Authority.

(iii) Design and Technical Specification duly filled in as per Tender Document

(iv) Experience in Similar kind of works.

(v) VAT Registration and latests clearance Certificate upto March, 2010

(vi) Any deviation with Justification thereof.

(vii) Any other.

(b) **Financial Bid should contains:**

(i) Tender Paper Part – 'B' as issued by the Agency duly signed and seal by the Authorized persons of the Firm.

(ii) Price can be quoted on plain paper but it should be in the Format given.

(iii) Earnest Money Deposit.

3. 19 : **Service Centre**- It is mandatory that the Manufacturer or Supplier should have a local service centre in the state, and preference will be given to those Firm.

3.20 : **Exemption of EMD**- The Manufacturer or Supplier who claim exemption shall have to and SSI Registration Certificate issued by NSIC.

3.21 : **Breach / cancellation of the contract** :-

(a) In case of non-performance in any form or change of the convenants and conditions in this contract by the contractor, MNREDA shall have the power to annual, rescind, cancel or terminate the contract and upon its notifying in writing to the contractor that it has so done, this contract shall absolutely determine. The decision of MNREDA in this regard shall be final and binding.

(b) The purchaser may cancel the contract or a portion thereof and if so purchase or authorized purchase of the plant/equipment not so delivered or order plant equipment of similar description (opinion of the purchaser shall be final) at the risk and cost of the contractor. If the contractor had defaulted in the performance of the original contract, the purchaser shall have the right to ignore his tender for risk purchase even though lowest.

3.22 : **Responsibility of the contractor :**

The contractor shall guarantee and be entirely responsible for the execution of the contract in accordance with the specification, schedules and appendices. He shall further guarantee and be responsible for the quality and workmanship of all materials and completed works, correct designs and drawings, correct delivery of materials, erection, testing and commissioning, within the guaranteed completion and warranty period of 5(five) years from the date of commissioning on completion of commissioning a separate agreement shall have to be signed in their respect for comprehensive maintenance contract.

3.23 : **Tools and Tackles** :

The contractor shall provide all tools and tackles conforming to relevant BIS safety and technical standard for proper execution of work, MNREDA shall in no way, he responsible for supply of any tools and tackles for implementation of the work.

3.24 : **Safety Measures** :-

The Contractor shall have to undertake necessary measures for providing adequate safety and precautions to avoid any accident which may cause damage to any equipment/material or injury to workmen. MNREDA shall not responsible for any such accidents.

3.25 : **Delivery of system** :-

(i) The contractor shall deliver the plant/systems in accordance with the terms of the contract at the time/times at the place/places and in the manner specified in the contract. The contractor shall comply with instructions that may be given by the purchaser from time to time regarding the transit of the plant and material.

(ii) Notification of delivery or dispatch in regard to each and every consignment shall be made to the purchaser immediately after dispatch or delivery. The contractor shall supply to the consignee invoice in duplicate and packing account of all stores delivered or dispatch by him.

(iii) In case of any occurrence of loss or damage in transit upto destination, it shall be liability of the contractor to initiate or pursue the claim with Insurance Company. He should take immediate steps to repair the damaged apparatus or replacement thereto. Any extension of time limit required in such contingency will be considered by the purchaser on merit.

3.26: **Arbitration :**

(i) Except where otherwise provided if at anytime question dispute or difference whatever shall arise between the contractor and the purchaser upon or in the relation to or 1(one) connection with this contract either of the parties may give to the other notice in writing of the existence of such a question on rejection of the matter, the dispute or difference shall be referred to the sole arbitration appointed by MNREDA at the time of dispute after ascertaining the terms of reference mutually.

(ii) The Arbitration will preferably be a member of Arbitration Council and arbitration proceeding will take place as per provision or arbitration Act 1940 or any statutory modification or re-enactment thereof and the rules made there under and for the time being in force shall apply.

(iii) The contractor will ensure that the work under this contract shall continue during arbitration proceeding and dispute and no payments due from or payment by the purchaser shall be withhold on account of such proceeding except to the extent which may be in dispute.

3.27 : **Court of Competent Jurisdiction** :-

The Courts of Gauhati High Courts, Shillong Bench will only have jurisdiction in this case.

4. **Design Guidelines & Specification** :

i) **The scope of work :**

For 10 Kw Wind Solar Hybrid System :60% Wind and 40% Solar

a. Aero generator combination of approved MNRE i.e. 1.4 Kw, 3.2 Kw, Kw, 5 Kw and 5.1 Kw vide C-WET/R&D/Empl/2010-11/02A Dtd. 4.8.10 issued by Centre for Wind Energy Technology, Chennai.

b. A Total 40% SPV Panel
c. Battery bank 2V cell, 48V, 1800 AH
d. Charge controller and battery charger
e. 5 Kw Inverter of both AC & DC expect of Aero generator and SPV with 230 AC output.
f. Mounting structure for SPV Panel and a aero generator
g. Junction Boxes, DC distribution board and AC distribution board
h. Lighting and over voltage protection and earthing
i. Provision of street lighting system and domestic connection
j. Power House and security fencing

ii. The supplier & manufacturer are to design the systems and furnished the technical specification base don the above guidelines in the scope of work without furnishing the above details no offer will be considered. The Wind Solar Hybrid design will be considered and give priority to the firm/supplier/manufacturer who had the experience of similar kind of work.

(iii) Board Technical specification of the aero generator should include the unit capacity, No.of blades rotor diameter, cut-in-wind speed and rotor wind speed of its capacity. The Specification should be as :-

a) **Number,Capacity, speficiation and power curve of Aerogenerator proposed:-**

Aerogenerator : (To furnish in a separate sheet for different atype of approve wind Aerogenerator for as per combination)

i) Capacity
ii) Make & Model No.
iii) Rated wind speed
iv) Peak power
v) Start generating wind speed
vi) Survival wind speed
vii) Propeller diameter
viii) Propeller material & No. of blades
ix) Generator
x) Weight

xi) Voltage controller
xii) Over speed protection
xiii) No.of machines
xiv) Tower Height

(b) **Number & Specification of SPV Modules :**

SPV Modules :

i) Capacity
ii) Make
iii) Peak power per module
iv) Weight
v) Dimension W xHxD
vi) Temperature
vii) Wind Load
viii) Humidity No.of SPV Modules

Notes : Aero Generator should be approved Govt.of India, Ministry of New & Renewable Energy.

iv) **Solar PV Modules & Array** :

(a) Solar Modules shall consists of redundantly interconnected 36 Photovoltaic cell and the peak power rating shall to be specified as per design.

(b) SPV Modules must be tested & certified by an independent testing laboratory that is accredited with ISO guide 25. The Module type must be qualified as per IEC 61215or IE 1992 or CEC 503 for mono crystalline silicon and IE 616464 or CEC 50B or IEC 61646 or IEEE 1262 or multi crystalline silicon module has to be tested and certified by SEC, MNRE, Govt.of India.

(c) Photo electrical conduction efficiency of SPV Modules should be greater than 12% Modules shall be made of high transitivity glass front surface giving high encapsulation gain and silicon rubber edge sealant for Modules protection & mechanical support.

(d) The rated power output of modules shall not vary more than 5% from the average power rating.

(e) A minimum warranty of 10 years is available with degration of power generated not exceeding 10% over the entire 10 years period.

(f) The fill factor of modules shall not be less than 1.7

(g) The Module should be provided with a Junction for provision of external screw Terminal connection and with an arrangement for low voltage drop by pass/blocking dioxide.

Data sheet should be furnish as follow :-

a) Module type :
b) Module dimension :
c) No.of Cell & Wattage :
d) Solar cell manufacturer type :
e) Make of Solar Module :
f) Solar Module frame material :
g) Nominal voltage :
h) Operating voltage of solar module :
i) Peak Power voltage (Vmp) at :
j) Peak Power Current (Imp) :
k) Open circuit voltage (Voc) at :
l) Maximum temperature rise of solar cell. :
under severe working conditions
over maximum ambient temperature

m) Operating temperature conditions of Modules :

n) Weight of each module :

o) Array combination of Modules in series and parallel should be design and indicate properly for all types of power plants.

p) Mounting structure, orientation and tilt of PV Modules :-

The array mounting structure of modules shall be made of hot dip galvanished M.S. angle of size not less than 1617x807x42 SQMM. All nuts and bolts Shall be made of very good quality stainless steel SS-304.

q) The structure shall be design to allow easy replacement of any modules.

r) Supper structure design and foundation of fixation of mounting arrangement shall with stand minimum horizontal wind speed of 200 kw/hour.
Modules alignment and title angle shall have to be calculated to provide the maximum annual energy output and solar array will be tilted at appropriate angle from 40^{o} to $+90^{o}$ in order to get maximum output from SPV panel. Each supporting structure shall be fixed on RC concrete foundation structure.

m) All faster shall be of stainless steel SS-304

n) The foundation for module mounting structure shall be 1:2:4 PCC construction.

o) Clearance between ground Level and bottom edge of SPV Module array of Modules should not be less than 1 meter.

(v) **Junction Boxes** :

(a) The Junction Boxes shall be made of FRP with dust water and vermin and water proof (IPSS) and made of Thermo Plastic.

(b) The Terminals shall be of copper bus bar arrangement of appropriate size shall have fuses, in such a way where it shall be possible to isolate a single array from the system by removing the fuse without disturbing the system operation.

(c) All cables passing into junction boxes shall be terminated correctly.

(d) Suitable arrangement shall have to be provided for connecting reverse Blocking Diodes in the array junction boxes.

(e) The required number of junction in each type of power plant should be indicated in the array diagram.

(vi) **D.C.Distribution Board :**

(a) A D.C.DB shall have to provide between Array and PCU.

(b) It shall have MCCB of suitable rating for connection and disconnection of array section

(c) It shall have measuring instruments for measuring array voltage and array current.

(vii) **A.C.Distribution Board** :

(a) An ACDB shall be provided in between Inverter and load and between aero generator and battery charger.

(b) It shall have MCCB of suitable rating for connection and disconnection of Inverter from the load.

(c) It shall have energy meter i.e. voltmeter and almeter.

(viii) **Charge controller & Battery charger** :

(a) The charge controller shall be dual input i.e. it can be either from SPV panel and from the aero generator. A selector switch shall have to be provided from choosing between two modes. When battery are charged from A.C.Sources, the charging current should be set manually depending on the capacity of the sources and charging requirement of the battery.

(b) Maximum point power tracker shall be integrated in the charge controller to maximum energy drawn from solar PV array. The MPPT should be Micro processor/micro controller based to minimize power loss. The efficiency should not be less than 90% and should be designed to meet solar array capacity.

(c) The charge controller shall have a provision for charging from the Aero generator to the battery and also to feed directly from aero generator to load.

(d) Charging sequence from SPV array or Aerogenerator shall be as follows :-

(a) **From SPV Array :**

(i) The Battery shall be charge at the maximum rate depending on solar radiation till the battery terminal voltage is 2.4 volt per cell.

(ii) The battery charging should be automatically terminate when the rate of increase of battery voltage is steady or when battery terminal voltage reaches 2.75 volts per cell.

(iii) The charger shall switch on the "Tackle charge: after this

(b) **From Aero Generator** :

(i) The battery shall be charged at the rate manually set depending on the battery Condition or capacity of aerogenerator. The maximum rate shall be internally presset.

(ii) The battery charging should be automatically terminated when the rate of increase of battery voltage is steady or when the battery terminal voltage reaches 2.75 volts per cell.

(ix) **Inverter :**

(a) The Inverter shall continuously monitor and control and the output interface within a stipulated range by means of suitable software and should be compatible with the charge controller and distribution panel and may integral design.

(b) The Inverter should be design for continuous, reliable and prime power supply.

(c) The Inverter shall have high conversion efficiency from 25% load to the full rated load. The conversion efficiency 1t 25% load shall not be less than 90% of the full rated load. The efficiency of the inverter shall be more than 92% at full rated load.

(d) The Inverter shall have high over load capacity. The overload capacity of the inverter shall be minimum of 200% at full rated load output for 30 seconds and 300% of full rated load output for 10 seconds. During overload conditions, the inverter shall be capable of maintaining the rated voltage and frequency as per specification. The overload capacity should be specify.

(e)The inverted should have automatic restart facility after overload triggered shutdown.

(f)Technical data sheet/specification are(should be submitted with the bid)

(a) D.C.Input voltage/A.C.Input voltage
(b) Output voltage
(c) Output voltage regulation.
(d) Overload capacity
(e) Continuous power rating
(f) Peak output shape
(g) Output wave shape
(h) Efficiency at ambient temperature
(i) Ambient Temperature
(j) Humidity range
(k) Short circuit protection
(l) Cooling type
(m) Enclosure construction
(n) Front Panel control
(o) Dimension
(p) Weight
(q) Mounting arrangement
(r) Other detail protection
(s) Other details indications

(x) **Battery & Battery Bank :**

(a) The batteries should be of flooded electrolyte type, positive tubular plate, low maintenance lead batteries and shall confirm to ISI 651.
(b) The batteries shall be of 2V cells with end cut off voltage 1.8 per cell and battery terminal should be provided with covers.
(c) Design voltage of system should by 48V system
(d) Battery capacity of each plant should be designed taken as a full rated load capacity available from the solar array with two days autonomy taking into consideration.
(e) Batteries should be provided with micro porous vent plugs with floats and suitable handle.
(f) A suitable battery rack with interconnection & end connector shall be provided to in between the batteries in the bank. The features and dimensions of the battery rack shall have to provide along with the bid

(g) The batteries shall be suitable for recharging by means of solar modules via incremental/open circuit regulator.
(h) Bidder shall mention the design cycle life of batteries at 85% depth of discharge at 25 degree C. Details for 30% & 50% DOD shall be provided.
(i) The batteries shall be designed for operating in ambient temperature of site.
(j) The battery container shall be made of hard rubber.
(k) The self discharge of batteries shall be less than 3% per month at 20 degree C and less than 6% per month at 30 degree C.
(l) The charge efficiency shall be more than 90% upto 95% state of charge.
(m) The topping up frequency shall be 18-24 months.
(n) The batteries shall consist of individual cells, which can be carried separately with case while transporting.
(o) Bidders to specify capacity & end cell voltage at different discharge rates
(p) Battery rack & accessories

Battery interconnecting links shall be provided for interconnecting the cells in series and in parallel as needed. Connectors for inter cell connection (series/parallel) shall be maintenance free screws. Insulated terminal covers shall be provided.

(q) **Specification should consist of** :

(i) Manufacturer
(ii) Type battery
(iii) Nominal voltage
(iv) End cell voltage
(v) Capacity of battery system
(vi) Depth of discharge
(vii) Efficiency of battery
(viii)Duty cycle
(ix) Combination of battery series and parallel
(x) Structural details
(xi) Battery guarantee
(xii) Filling System : Auto fill

(xi) **Cables interconnecting** :

(a) All cables shall be supplied confirming to IS 1554/694-1990 and shall be of 650V/1.1 Kv grade and PVC insulted.

(b) Cables in the array yard shall be laid directly in ground at a depth of 500 mm in the excavated trenches along with approve route and cover with sand cushion. A continuous single brick protective layer of first class brick shall be placed on the entered length of the underground cable before refilling the trench with loose soil.

(c) Cable inside the control room shall be laid in trenches duly covered with RCC slab.

(d) Copper terminations shall be made with suitable cable lungs & sockets etc. crimped properly and passed through proper cable glands at the entry & exit point of the cubicle.

(e) Cable terminations shall be made with suitable cable lugs & sockets etc. crimped properly and passed through proper cable glands at the entry & exit point of the cubicle.

(f) All cables/wires shall be marked with good quality ferrite of proper sizes so that cables can be identified easily.

(g) Interconnecting cable size of Modules to Modules, array to array/junction boxes junction box to controller, controller to DCDB, DCDB yo ACDB to main distribution and aero generator to charge controller, aero generator to inverter or load should be indicated.

(xii) **Light and over voltage protection :**

(a) The SPV power plant should be provided with lighting and over voltage protection. The main aim of over voltage protection is to reduce the over voltage to a tolerable level before it reaches the PV modules and other sub-system component as hilly areas are prone to lighting and other atmospheric disturbance.

(b) The lighting conductor shall me made of 25mm diameter & 4000mm long G.I. spike as per provision of IS 2309-1969. The lighting conductor shall be earthed through 20mmx300mm thick G.I.Flat plate with earth pit. Necessary concrete foundation for holding the lighting conductor in position to be made.

(c) The earth pit shall be made with G.I. pipe, 4.5m long 40mm diameter including accessories watering pipe using charcoal and salt as required as per provision of IS-3043.

(xiii) **Earthing :**

(a) Each array structure of the SPV yard shall be grounded properly : Adequate number of lighting conductor shall be provided inside the array field to the provided an acceptable degree of protection as IS:1309.

(b) All non-current metal parts must be earthed with two separate and distinct earth continuity conductors

(xiv) **Power House & Security fencing** :

(a)Power House should consists of one room for battery, one room for controller and inverter switch yard in built with one toilet Block.

(b) Size of Power House should be specific clearly for each room and different type of power plant.

(c) Flooring of power house should be RCC, walling should be 1^{st} class brick and roofing should be made of C.G.I. sheet of good quality and ceiling by the 4mm thick plywood.

(d) Security fencing of power house and switch yard modules array shall be provided with barbed wire fencing mounted in an angle iron of2.200 height with a 160 mm long portion bend at 30^{o} incline outside as per required length of each type of power plant.

(e) Detail construction drawing should be furnished for approval by MNREDA before going a head with the civil work structure of power house and security fencing of switch yard.

(xv) **Lighting system :**

(a) Inside a power house for each room and outside main door should be provided with a 9 watts CFL Lamp fixture luminair properly wiring by making used of PVC conduit pipe.

(b) Necessary replacement of lamp & fixture to the utility point as per requirements.

(xvi) **Supply of spare kits & tools :**

The supplier shall provide spare required during warrantee period free of cost. Beyond warrantee period the supplier shall ensure that spare are made available to MNREDA at reasonable charges. Repairing tools & kits i.e. multimeter, screw driver sets, spanners etc. should be supplied for each plant.

(xvi) **Packaging, shipping & marking** :

The supplier shall be responsible for assuring that all commodities shipped are properly package and protected to prevent damage or deterioration during shipment. Packaging and shipping cost shall be borne by the supplier. Customs clearance and all costs and actions associated with import duties taxes and processing of documents within India are borne by the bidder.

(xvii) **Installation & Commissioning** :

(a) The offer should include provision for installation of the entire system.

(b) The supplier is responsible for the supply of instrument required to commission and installation. The plant will be commissioned in the presence of authorized personnel or its nominated representative. A commissioning protocol should be provided in the offer and an acceptance report will be prepared and signed by all participating parties.

(xviii) **After sales service :**

The offer should include the terms and conditions for after sales service. The detailed content of the service proposed, and its duration should clearly be stated. Bidders having own/authorized service centers in Shillong or North East Region shall be given preference.

(xix) **Training and after sales service :**

Training and after sales service is an important component of supply. The terms and conditions for training and after sales supply and service are to be presented clearly in the bid and the extent and duration of after sales support clearly defined. An explanation of preventative maintenance schedule, plan of operation, scope and implementation of the sale service is to be defined.

(xx) **Experience :**

A comprehensive list of past projects implemented by the bidder/bidder group company/collaborator in India or Broad, including clients, dates size of projects and any other relevant material should be included in the offer. The award of work will be done strictly based on past experience of similar kind of works.

(xxi) **Documentation** :

One set of installation manual/user manual shall be supplied along with the system assembly of the complete system shall be shown with computer aided design and drawing form. Step by step maintenance procedures shall be given in the manuals.

(xxii) **Guarantee performance agreement :**

An Agreement listed system and sub systems of the offer for each component guarantee has to be signed between supplied and MNREDA.

(xxiii) **Deviation of the tender** :

In case of deviation the below format should be observes.

(a) **General conditions of contract** :

Sl.No.	Specification clause	Deviation by the tender	Justification by the tender

(b) **Technical Specification of contract** :

Sl.No.	Specification clause	Deviation by the tender	Justification by the tender

(xxv) **Repair and maintenance** :

(a) The manufacturer/supplied are requested to provide "on site" training to the users in O & M of the systems and equip them to attend to the minor repair themselves.
(b) The manufacturer/supplier will have to be undertaken an Annual Maintenance contract of 3(three) years after the end of the warranty/guarantee period.
(c) The manufacturer/supplier should provide spares for 3 years trouble free operation of the system.

MEGHALAYA NON-CONVENTIONAL AND RURAL ENERGY DEVELOPMENT AGENCY

Near BSF Camp Mawpat, Shillong-793012.
Phone No.0364-2537343/2536138## Fax No.0364-2537611
E-Mail mnreda_shg @ bsnl.in ## Website www.mnreda.Gov.in

TENDER DOCUMENT

1.	WORK NO.	:	MNREDA/1417/2010/9
2.	Name of Work	:	Design, Supply, Installation and Commissioning of 13 Nos.of 10 Kw Solar Wind Hybrid at different sites in Meghalaya.
3.	Date of Issue of Tender Document	:	25.10.2010 to 19.11.2010
4.	Date of submission of Tender	:	22.11.2010 at 12.00 hours
5.	Date of Opening of Tender for Commercial Terms and Technical Bid.	:	22.11.2010 at 13.00 hours.

6. Tender Issue to_____ against application vide letter NO._____dated_____ against payment of Rs. 5,000/- (Rupees Five thousand) only vide Demand Draft/Bankers Cheque No./Cash---------- dated----------of Bank towards cost of Tender Document (Non-refundable)

PART – B

BIDDING SCHEDULED

(Page 23 to 24)

Issued by :_____

FOR MEMBER SECRETARY CUM DIRECTOR,
MEGHALAYA NON CONVENTIONAL AND
RURAL ENERGY DEVELOPMENT AGENCY,
SHILLONG.

INDEX

5. **BIDDING SCHEDULED :**

Sl. No.	Description of Item	Quantity	Unit	Rate (Rs.)	Amount (Rs.)
A.	Equipments:				
i)	Wind Aerogenerator				
ii)	Watts Solar Photovoltaics Modules				
iii)	48V, 1800 AH LMLA Battery bank.				
iv)	Inverter 48V DC Input, 230 V DC output 5 KVA.				
v)	Charge controller				
vi)	SPV Mounting structure with foundation				
vii)	Aerogenerator foundation				
viii)	Wind runner				
ix)	Lighting Arrester				
x)	Earthing Kit				
xi)	AC DB				
xii)	DC DB				
xiii)	Cabling networks as per required				
	Total “A” equipment cost				

B.	Installation and commissioning				
C.	Battery house as per required size				
D.	Transportation and taxes				
E.	Total A+B+C+D				
F.	AMC three years				
	Grand total				

(Rupees----------)only.

Notes : 1. For Wind Aerogenerator depends on combination to make 60% wind and 40% solar Item A (i) should specify the size without which offer will be rejected.

2. For A(xiv)- size of cable with total quantity should be enclosed along with bidding scheduled without which offer will be rejected.

Dated :----------

Signed & Seal of the authorize signatory of the Firm.