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.dir@gmail.com ## Website www.mnreda.Gov.in

AGENDUM.

No.MNREDA/1501/2012/17 :- In reference to the NIT No.MNREDA/1501/2012/16 Dated Shillong the 17.10.2012 in which 3 watt LED based Solar Lantern were called Tenders, please noted the recent Technical Specification issued by the Ministry of New and Renewable Energy Govt. of India, New Delhi for white LED base Solar Lantern for off-grid Solar Applications Scheme for 2012-2013. The details are attached herewith.

Kindly follow up the specification at Sect-4 of our Tender Document as required as per enclosure enclosed.

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

Memo. NIT No.MNREDA/1501/2012/17(a) Dated Shillong the 5th November, 2012.

Copy to :-

(i) M/s MINDA Industries Ltd.
Delhi – 110052

(ii) M/s U.M. GREEN
New Delhi.

(iii) Hotel Polo Towers Pvt. Ltd., Shillong.

(iv) N.I.C.

5/11/12

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

Ministry of New and Renewable Energy
Jawaharlal Nehru National solar Mission

TECHNICAL SPECIFICATIONS FOR
WHITE LED (W-LED) BASED SOLAR PHOTOVOLTAIC LIGHTING SYSTEMS
(Off-grid Solar Applications Scheme 2012-2013)
WHITE LED (W-LED) BASED SOLAR LANTERN

A Solar Lantern is a portable lighting device consisting of a PV module, battery, lamp, and electronics. Battery, lamp, and electronics are placed in a suitable housing, made of metal or plastic or fiber glass. The Solar lantern is suitable for either indoor or outdoor lighting, covering a full range of 360 degrees.
PV module converts sun light into electricity, charges the battery which powers the luminaire. Luminaire consists of White Light Emitting Diode (W-LED), a solid state device which emits light when an electric current passes through it.

BROAD PERFORMANCE SPECIFICATIONS

The broad performance specifications of a W-LED light source based solar lantern system are given below:

PV Module	5 Wp under STC
Battery	Sealed Maintenance Free (SMF) lead acid battery or NiMH battery or Lithium Ion Battery
Light Source	W-LED luminaire, dispersed beam, soothing to eyes with the use of proper optics and diffuser
Light Output	Minimum level of illuminance from W-LED lantern should be as follows:

Sl. No.	Distance in feet	Illumination levelwhen detector is in horizontal to center point of bottom of light source in Lux	Illumination level When detector is at an angle of 90° to the center point of the bottom of light source in Lux
1	1	50.0	160.0
2	2	10.0	50.0
3	3	4.5	25.0
4	4	3.0	15.0
5	5	2.0	10.0

Electronics	Efficiency approximately 85%
Duty cycle	4 hours a day under average daily insolation of 5.5 kWh/ sq.m. on a horizontal surface.
Autonomy	Minimum of 3 days or 12 operating hours per permissible Discharge.

TECHNICAL DETAILS

PV MODULE

(i) Indigenously manufactured PV modules should be used in the solar lantern.

(ii) The PV module should have crystalline silicon solar cells, and should have a test certificate conforming to IEC 61215 Edition II / BIS 14286 from an NABL or IECQ accredited Laboratory. In case the certificate for the offered module is not available, a test certificate for higher capacity module produced by the same PV module manufacturer should be available.

(iii) The PV module must have a minimum of 5 Wp at a load voltage* of 16.40 ±0.2 V under the standard test conditions (STC) of measurement.

(iv) The open circuit voltage* of the PV modules under STC should be at least 21.0 Volts.

(v) **The module efficiency should not be less than 10%.**

(vi) The terminal box on the module should have a provision of opening it for replacing the cable, if required.

(vii) There should preferably be an arrangement (stand) for mounting the module at an optimum angle in the direction facing the sun.

(viii) A foil/ strip containing the following details should be fixed inside the module so as to be clearly visible from the front side:-

a) Name of the Manufacturer and/ or distinctive Logo
b) Model and/ or Type No.
c) Serial No.
d) Year of manufacture

(vii) **A distinctive serial number starting with NSM will be engraved on the frame of the module or screen printed on the tedlar sheet of the module.**

*****The load and open circuit voltage conditions of the PV module are not applicable for the system having MPPT.

BATTERY

(i) Sealed maintenance free lead acid battery with a capacity of up to 7 AH, at voltages of up to 12V @ C/20 rate of discharge
or NiMH or Lithium Ion battery of requisite capacity

(ii) Battery should conform to the latest BIS/ International standards.

LIGHT SOURCE

i. The light source will be of White Light Emitting Diode (W-LED) type.

ii. The colour temperature of W-LED(s) used in the system should be in the range of $5500^{o}K$ –$6500^{o}K$.

iii. W-LED(s) should not emit ultraviolet light.

iv. The light output from the W - LED should be constant throughout the duty cycle.

v. The housing should be suitable for indoor as well as outdoor use.

ELECTRONICS

(i) Efficiency of the electronic system should be at least 85%.
(ii) Electronics should have temperature compensation for proper charging of the battery throughout the year.
(iii) The idle current should be less than 1 mA
(iv) The PCB containing the electronics should be capable of solder free installation and replacement.
(v) Necessary lengths of wires/ cables, switches suitable for DC use and other protections should be provided.

ELECTRONIC PROTECTIONS

(i) Adequate protection is to be incorporated for “No Load” condition, e.g. when the lamp is removed and the lantern is switched ON.
(ii) The system should have protection against battery overcharge and deep discharge conditions.
(iii) The load reconnect should be provided at around 80% of the battery capacity status.
(iv) Adequate protection should be provided against battery reverse polarity.
(v) A fuse should be provided to protect against short circuit conditions.
(vi) Protection for reverse flow of current through the PV module should be provided.
(vii) During the charging, lamp cannot be Switched “ON”.

INDICATORS

The system should have two indicators, green and red.
The green indicator should indicate the charging under progress and should glow only when the charging is taking place. It should stop glowing when the battery is fully charged.
Red indicator should indicate the battery “Load Cut Off” condition.

QUALITY AND WARRANTY

(i) The complete Solar Lantern with W-LED will be warranted for five years and the battery must be warranted for a minimum period of Two (2) years.
(ii) The Warrantee/ Guarantee Card to be supplied with the Solar Lantern must contain the details of the system supplied.

OPERATION and MAINTENANCE MANUAL

An Operation, Instruction and Maintenance Manual, in English and the local language, should be provided with the Solar Lantern. The following minimum details must be provided in the Manual:

- Basic principles of Photovoltaics.
- A small write-up (with a block diagram) on Solar Lanterns - its components, PV module, battery, electronics and luminaire and expected performance.
- Significance of indicators.
- Type, Model number, Voltage, capacity of the battery, used in the system.
- The make, model number, country of origin and technical characteristics (including IESNA LM-80 report) of W-LEDs used in the lighting system.
- Clear instructions on mounting, operation, regular maintenance and trouble shooting of the Solar Lantern.
- Instructions on replacement of battery.
- DO's and DONT's.
- Name and address of the contact person for repair and maintenance during the warranty.