BID SPECIFICATION
FOR
SOLAR STREET LIGHTING SYSTEM

ANNEXURE –I

SECTION – 2A
Technical Specification for CFL based SSLS

1.0 DEFINITION

A stand alone solar photo voltaic street lighting system comprises of a compact fluorescent lamp, lead acid battery, a PV module(s), control electronics, inter connecting wires/cable, module mounting hardware, battery box, operation, instruction and maintenance manual.

2.0 SCOPE OF WORK

The scope of work includes:
Manufacture, testing, packing & forwarding, transportation, supply, installation & commissioning of CFL/LED based SSLS system complete in all respects along with one set of operation instruction cum maintenance manual (Hindi) for each set and delivery on FOR destination/site (door delivery) basis across the State of Jharkhand including, demonstration of performance and training at all sites located within the state of Jharkhand as per direction of JREDA. List of villages will be given before start of dispatch by JREDA. The Solar Street Lighting System shall be supplied as per the following specification.

3.0 TECHNICAL SPECIFICATION

The CFL based Solar Street Lighting System shall be Indigenous make should conform to the following model:

TYPE OF SSLS	COMPONENTS	SPECIFICATION
Suitable model	PV Module	1x74Wp or 2x37 Wp under STC
	Lamp	1xCFL (11W), 4-Pin
	Battery	1x12V, 75AH, Tubular Plate, low maintenance type Lead Acid Battery,
	Other Components	Control electronics, Module mounting hardware, Battery box, Inter connecting wires/cables,Switches, Operation, Instruction and Maintenance Manual.

3.1 DUTY CYCLE

The system shall be designed to automatically switch ON at dusk, operate throughout the night and automatically switch OFF at the down, under average daily insolation of 5 kWh/sq.m on a horizontal surface.

3.2 LAMPS

(a) The lamps shall be compact fluorescent (CFL) type, 4 – Pin, with rating of 11 W. A suitable pre-heating circuit must be provided.
(b) The light output from the lamps should be around 900±5% lumens. No blackening or reduction in the lumen output by more than 10% should be observed after 1000 ON/OFF cycles (two minutes ON followed by four minutes OFF is one cycle).

(c) The lamps should be housed in a weather proof assembly suitable for outdoor use, with a reflector on its back. While fixing the assembly, the lamp should be held in a base up configuration.

3.3 BATTERY

(a) The battery shall be of flooded electrolyte type, positive tubular plate, and low maintenance lead acid battery conforming to relevant BIS standards
(b) The battery will have a minimum rating of 12V, 75AH (at C/10) discharge rate
(c) 75% of the rated capacity of the battery should be between fully charged and load cut off

3.4 ELECTRONICS

(a) The inverter will be of quasi sine wave/sine wave type with a frequency in the range of 20-35 KHz. Half-wave operation is not acceptable.
(b) The total electronic efficiency shall be at least 80%
(c) No blackening or reduction in the lumen output by more than 10% should be observed after 1000 ON/OFF cycles (two minutes ON followed by four minutes OFF is one cycle).
(d) The idle current consumption should not be more than 10mA
(e) Electronics shall be operating at 12 V and should have temperature compensation for proper charging of the battery through out the year.
(f) Necessary length (minimum 5 m) of wires/cables (2 core x 1.5 sq.m.m.), switches suitable for DC use and fuses shall be provided.
(g) The PV module shall be used to sense the ambient light level for switching ON and OFF the lamp

3.5 PV MODULE (S)

(a) The PV Module(s) shall contain crystalline silicon solar cells
(b) The power output of the module(s) under STC should be a minimum of 74W. Either two modules of minimum 37W output each or one module of 74w output shall be used.
(c) The operating voltage corresponding to power output mentioned above should be 16.4V
(d) The open circuit voltage of the PV module under STC shall be at least 21.0V
(e) The terminal box on the module should have a provision for opening for replacing the cable, if required.
(f) A strip containing the following details should be laminated inside the module so as to be clearly visible from the front side.

i. Name of the Manufacturer or distinctive logo.
ii. Model or Type No.
iii. Serial No.
iv. Year of make

(g) Models of reputed make shall be offered.

JREDA SPECIFICATION

(a) Monogram of JREDA along with following details translated into Hindi language shall be laminated in Devnagari script on the left hand top corner in front of each PV Module.

- General Programme 2007-08
- Not for sale or transfer
- Statutory action would be taken by JREDA, if it found sold or transferred, under different sections of IPC.

(b) Frame of PV Module shall be painted golden yellow colour.

(c) A strip containing the following detail should be mentioned in Hindi language and pasted in permanent manner at the back of the module:

(i) Cost of the system Rs. 24691/-(Rs. wenty Four Thousand Six Hundred Ninety One Only)

(ii) State subsidy to different categories viz. SC/ST/primitive/General.
Rs. 18,000/- (Rs. Eighteen Thousand Only)

(iii) Beneficiary contribution.
Rs. 6,691/- (Six Thousand Six Hundred Ninety One Only)

3.6 ELECTRONIC PROTECTION

(a) Adequate protection is to be incorporated under no load conditions (e.g. when the lamp is removed and the system is switched ON).

(b) Battery cut offs & reconnects should be provided to protect it against overcharge and deep discharge condition as per MNRE specifications.

(c) Fuses should be provided to protect against short circuit conditions.

(d) A blocking diode, diode, should be provided as part of the electronics to prevent reverse flow of current through the PV module, if such a diode is not provided with the module itself.

(e) Full protection against open circuit, accidental short circuit and reverse polarity should be provided.

3.7 MECHANICAL COMPONENTS

(a) Metallic frame structure (with corrosion resistance paint) to be fixed on the pole to hold the SPV module(s). The frame structure should have provision to adjust its angle of inclination to the horizontal between 0 and 45 , so that it can be installed at the specified tilt angle.

(b) The pole should be made of mild steel pipe with a height of 4 meters above ground level, after grouting and final installation. The pole should be either in one piece with uniform diameter of 76mmOD or swaged type with 76 OD in lower portion and 60mmOD in upper portion or 76 mm OD throughout. The pole should have minimum thickness of 3mm and have the provision to hold the weather proof lamp housing. It should be duly primered (2 coats) and painted with a corrosion resistant paint colour of silver ash.

(c) The Battery Box should be vented metallic box with acid proof and corrosion resistant painted for outdoor use as per relevant BIS standard for housing the storage battery. Thickness of Battery box shall be minimum 0.70mm made of MS sheet. It would be preferred to have battery box of plastic/Acrylic/Polymer of minimum 2.5 mm thickness. The material used should be 100% acid proof, rust proof and good electrical insulator. The box should have grid structure at its base for proper strength.

3.8 OTHER FEATURES

(a) Two LED indicators one for a green light to indicate charging in progress, and another red LED to indicate deep discharge conditions of the battery. The green LED should glow only when the battery is actually being charged.

(b) The ON/OFF switch used in the SSLS must be suitable for use in DC circuit and be reliable with long life. A cable (2core×1.5 Sq.mm) of suitable length should be provided for inter connection between module and SSLS.

2. The following details should be marked indelibly on the SSLS.

i. Name of the Manufacturer or distinctive logo.
ii. Model or Type No.
iii. Serial No.
iv. Year of make

3 Components and parts used in Solar Street Lighting Systems should confirm to the latest BIS specification, whichever such specifications are available and applicable.

3.9 DOCUMENTATION:

An operation, Instruction Maintenance Manual in Hindi should be provided with the Solar Street Lighting System. The following minimum details must be provided in the manual:

(i) About Photovoltaic
(ii) About Solar Street Lighting System – its components and expected performance.
(iii) About PV Module.
(iv) About CFL
(v) About Battery
(vi) Clear instructions about mounting of PV module(s)
(vii) About electronics
(viii) About charging and significance of indicators.
(ix) Do's and Don'ts
(x) Clear instructions on regular maintenance and trouble shooting of Solar Street Lighting System .
(xi) Name and address of the person or service center to be contacted in case of failure or complaint.

3.10 WARRANTY

The PV module will be warranted for a minimum period of 10 years from the date of supply and the Solar Street Lighting System (including the battery) will be warranted for a minimum period of 2 years from the date of supply. The warranty card to be supplied with the system must contain the detail of the system supplied as given in the Proforma VIII. The manufacturers can also provided additional information about the system and condition of warranty as necessary.

