AMENDMENT IN BID DOCUMENT OF SOLAR HOME LIGHT

Date: 20/03/2018

Sr. No	Tender Clause No	Page no.	Clause in GEC Tender		Revised Clause
	LAST DATE AND TIME FOR RECEIPT OF BIDS		**26.03.2018 Up to 15.00 Hrs.**		**31.03.2018 Up to 15.00 Hrs.**
	DATE AND TIME OF OPENING OF BIDS		**26.03.2018 At 15.30 P.M.**		**31.03.2018 At 15.30 P.M.**
	IFB	4	The Bid Security should be valid for at least 45 days beyond the bid validity period i.e. at least up to **08.08.2018**.		The Bid Security should be valid for at least 45 days beyond the bid validity period i.e. at least up to **16.08.2018**.
	List of Goods and Delivery Schedule	56	**Latest Delivery Date** 90 Days		**Latest Delivery Date** **30 Days**
Section I. Instructions to Bidders					
A. General					
1.	Clause no 5.2	15	For purposes of this Clause, the term "goods" includes commodities, raw material, machinery, equipment, and industrial plants; and "related services" includes services such as insurance, installation, training, and Comprehensive Maintenance.		Comprehensive warranty for 1 year post – installation is to be provided.
Section III: Evaluation and Qualification Criteria					
2.	Clause no 1 Evaluation	38	The bidder as manufacturer or supplier must have manufactured / supplied similar equipment at **least 300 Nos**. in **last Five years** which are		The bidder must have supplied, installed and commissioned at least **150 nos.** of Solar PV Home Lighting

	Criteria(ITB 36.3) (f) b and Clause no. 3 (b) Experience and Technical Capacity	and 40	under **successful operation for at least one year** as on date of bid opening for this Package**.**		/ streetlight / similar solar PV systems in **last 05 (Five) Financial years** and till date of techno-commercial bid opening. Such systems must be in **satisfactory operation for at least 06 (Six) months** from the date of commissioning.
Price Schedule Forms					
3.	Price Schedule (7)	48	Price per line item for inland transportation, insurance and other services required to convey the Goods to their final destination.Including supplying Installation Commissioning including Three (03) years comprehensive Warranty incl. spare parts (free of cost) to the purchaser.		Price per line item for inland transportation, insurance and other services required to convey the Goods to their final destination. Including supplying Installation, performance tests, commissioning and 01 (One) Year Comprehensive warranty on the systems installed in the field.
Section VI: Schedule of Requirements					
1. List of Goods and Delivery Schedule					
4.	Clause no. 4	57	The equipment price shall cover all costs including installation, tests, trials and commissioning at Final (Project Site) Destinations as specified in BDS(Section II/ITB 14.6 (a) (iii)). Three Years Comprehensive warranty including replacement of parts Cost and Training to the Representatives from respective Villages for each of the Line Items in the List of Goods and Delivery Schedule as in the Table above. Three years warranty shall be given to each location site holder as directed by GEC.		The equipment price shall cover all costs including installation, tests, trials and commissioning at Final (Project Site) Destinations as specified in BDS(Section II/ITB 14.6 (a) (iii)). One Years Comprehensive warranty including replacement of parts Cost and Training to the Representatives from respective Villages for each of the Line Items in the List of Goods and Delivery Schedule as in the Table above. One year comprehensive warranty shall be given to each location site holder as directed by GEC
1. General Scope of Work					
5.	Clause no. 1.1	60	General scope of work involves Engineering, Procurement and Construction (EPC) of the proposed Renewable Energy Systems (RES) with required quantity at suggested locations on turn-key basis with Comprehensive Maintenance Contract (CMC) of the same as specified for each of the RES ("Works"). The Contractor shall construct and commission RES to deliver guaranteed plant performance as defined in Section VI-3.3.		General scope of work involves Engineering, Procurement and Construction (EPC) of the proposed Renewable Energy Systems (RES) with required quantity at suggested locations on turn-key basis with 1 year Comprehensive warranty on the systems installed for each of the RES ("Works"). The Contractor shall construct and commission RES to deliver guaranteed plant performance as defined

					in Section VI-3.3.
6.	Clause no. 1.2	60	Works includes Comprehensive Maintenance Contract (CMC) of the respective RES for 1 (One) year from the date of issue of completion certificate by the competent Authority, wherein the plant shall generate at least equivalent to the Guaranteed Performance of RES. The Bidder shall submit in the Bid a comprehensive project execution schedule as well as Maintenance (CMC) schedule with resource planning in the form of Gantt chart and shall be liable for abiding by the schedule.		'orks includes 1 year Comprehensive warranty of the stem installed of the respective RES for from the date of sue of completion certificate by the competent Authority, herein the plant shall generate at least equivalent to the uaranteed Performance of RES.
7.	Clause no. 3.1	60	Electrical work consists of supply and installation of solar PV modules, junction boxes, hybrid inverters, batteries, energy meters,weather sensors and data logger (wherever applicable) with remote web-based communication and monitoring hardware and software etc.; interconnection of facility through wires, cables, bus bars, etc.; supply and installation of earthing, grounding, lightening protection equipments; comprehensive testing of all equipments and system and commissioning; human safety and protection equipment including danger signs, fire fighting system etc. All designs, specifications, reports etc. submitted or used by the Contractor at any point in time shall first be approved by the Employer and revised by the Employer, if required, prior to execution.		Electrical work consists of supply and installation of solar PV modules, junction boxes, batteries, interconnection of facility through wires, cables, bus bars, etc.; supply and installation of earthing, grounding, lightening protection equipments; comprehensive testing of all equipments and system and commissioning; human safety and protection equipment including danger signs, fire fighting system etc. All designs, specifications, reports etc. submitted or used by the Contractor at any point in time shall first be approved by the Employer and revised by the Employer, if required, prior to execution
8.	Clause no. 7	61	**Comprehensive Annual Maintenance Contract(CMC)** **7.1** Contractors shall separately quote for Comprehensive Operation and Maintenance of the RESs installed by him for a period of One (1) year which includes complete replacement of faulty / non-functional part of the system installed by them. **7.2** Replacement of equipments due to regular wear and tear is also to be carried out by the Contractor. Contractor shall periodically (minimum once in quarter) visit every site where its system is installed and will carry out necessary maintenance. **7.3** The maintenance service provided shall ensure proper functioning of the Solar PV system as a whole. All preventive / routine maintenance and breakdown / corrective maintenance required for ensuring maximum uptime shall have to be provided. Accordingly, the Comprehensive Operation &Maintenance shall have two		**1 year comprehensive warranty on the installed system** **7.1** Contractors shall provide comprehensive warranty for the system supplied and installed at the site towards its trouble free operation, performance, functionality, manufacturing defect, workmanship and any operational issues minimum for one year from the date of installation and successful commissioning. **7.2** In case of even of failure on account of above, Contractor shall replace or repair the defective part free of cost during the warranty period.

			distinct components as described below: i. Preventive / Routine Maintenance: This shall be done by the Contractor regularly and shall include activities such as cleaning and checking the health of the Solar PV system, cleaning of module surface, tightening of all electrical connections, and any other activity that may be required for proper functioning of the system as a whole. ii. Breakdown / Corrective maintenance: Whenever a fault has occurred, the Contractor has to attend to rectify the fault & the fault must be rectified within 24 hrs time from the time of occurrence of fault failing which the Contractor will be penalized.		
9.	Clause no. 7.4	62	Contractor shall submit the quarterly report of performance of the systems in that village which shall be in the form of guaranteed performance of the plant, issues found and actions taken to resolve the issues based. The report shall be submitted in triplicate so as to provide one copy each to the respective person in-charge from the village, Employer and Consultant for the period of CMC.		**Clause removed.**
Technical Specifications					
10.	Clause no. 1.1 (iv)	62	IEC 61215 2nd Ed. (Design qualification and type approval for Crystalline Si modules), IEC 61730 (PV module safety qualification) and IEC 61701 (Salt-Mist Corrosion Resistance)		**Revised Clause:** Modules shall be certified as per IEC 61215 Edition II / BIS 14286 / other equivalent standards specified by MNRE or CERC or other equivalent statutory body.
11.	Clause no. 1.1 (v)	62	Minimum certified single unit module capacity shall be 37 Wp Crystalline-Si for streetlights and home light applications and ≥200 Wp for power packs.		**Revised Clause:** Minimum certified single unit module capacity shall be 37 Wp Crystalline-Si for home light applications
12.	Clause no. 1.1 (viii)		The module power mismatch losses for modules connected to an inverter (power pack application) should be less than 2%.		**Revised Clause:** The module power mismatch losses for modules connected to a power pack application should be less than 2%.
13.	Clause no. 1.1 (xviii)		Modules only with the same rating and manufacturer shall be connected to any single inverter. Modules there shall compulsorily bear following		**Revised Clause:** Modules there shall compulsorily bear following

			information in the form of ID encapsulated with solar cell in the manner so as not to cast shadow on the active area and to be clearly visible from the top. • Name of the manufacturer of the PV module • Name of the manufacturer of Solar Cells. • Month & year of the manufacture (separate for solar cells and modules) • Country of origin (separately for solar cells and module) • Wattage, Imp, Vmp, Isc, Voc, temperature co-efficient of power and FF for the module. • Unique Serial No. and Model No. of the module. • Date and year of obtaining IEC PV module qualification certificate • Name of the test lab issuing IEC certificate • Other relevant information on traceability of solar cells and module as per ISO 9001 and ISO 14001		information in the form of ID encapsulated with solar cell in the manner so as not to cast shadow on the active area and to be clearly visible from the top. • Name of the manufacturer of the PV module • Name of the manufacturer of Solar Cells. • Month & year of the manufacture (separate for solar cells and modules) • Country of origin (separately for solar cells and module) • Wattage, Imp, Vmp, Isc, Voc, temperature co-efficient of power and FF for the module. • Unique Serial No. and Model No. of the module. • Date and year of obtaining IEC PV module qualification certificate • Name of the test lab issuing IEC certificate • Other relevant information on traceability of solar cells and module as per ISO 9001 and ISO 14001
14.	Clause no. 1.2	64	Solar Hybrid Inverter cum Power Conditioning Unit (PCU)'s Requirements		**Clause is deleted.**
15.	Clause no. 1.3 (i)	67	The individual Batteries to be supplied for streetlights / home lights and for the hybrid power packs shall be sealed maintenance free (SMF) battery of Valve Regulated Lead Acid (VRLA) only.		Word hybrid power pack needs to be deleted. **Revised clause:** The individual Batteries to be supplied for streetlights / home lights shall be sealed maintenance free (SMF) battery of Valve Regulated Lead Acid (VRLA) only.
16.	Clause no. 1.5	68	***Power and Control Cables: Cable Specifications*** i. Wires with sufficient ampacity and parameters shall be designed and used so that maximum voltage-drop at full power from the PV modules to inverter to load should be less than 1.5% (including diode voltage drop). Contractor shall provide voltage drop calculations in excel sheet. ii. The size of each type of cable selected shall be based on minimum		**Revised Clause:** ***Power and Control Cables: Cable Specifications*** i. Single core UV stable solar grade DC cables shall be used for interconnection of solar PV modules to the charge controller to battery and to the load and shall conform to IS and should be of appropriate voltage grade. Only Copper / Aluminium conductor wires of

			voltage drop; however the maximum drop shall be limited to 2%. Due consideration shall be made for the de-rating of the cables with respect to the laying pattern in buried trenches / on cable trays, while sizing the cables. iii. All cables shall be supplied in the single largest length to restrict the straight-through joints to the minimum number. iv. All wires used for connection from PCU / Inverter to load / grid side shall conform to IS and should be of appropriate voltage grade. Only Copper / Aluminium conductor wires of reputed make shall be used. v. PV Modules should be connected with USE-2/RHW-2 cables array to photovoltaic disconnector with the THHN/THWN-2 sunlight resistant with 90ºC wet rated insulation cable. vi. Only terminal cable joints shall be accepted. No cable joint to join two cable ends shall be accepted. All cable/wires shall be marked with good quality letter and number ferrules of proper sizes so that the cables can be identified easily. vii. Cable terminations shall be made with suitable cable lugs & sockets etc, crimped properly and passed through brass compression type cable glands at the entry & exit point of the cubicles. 1.5.1. <u>Compliances and Certification</u> i. Cables connecting the string inverters to the grid transformers should be PVC insulated grade conforming to IS 694 / IS 1554 and cables shall also conform to IEC 60189 for test and measuring the methods. ii. Irrespective of utilization voltage and current rating all type of power cables shall be minimum of 1100 V grade PVC insulated conforming to IS 1554 / IS 694 for working voltage less than 150 V. iii. The cables shall be adequately insulated for the voltage required and shall be suitably color coded for the required service. Bending radii for cables shall be as per manufacturer's		reputed make shall be used. ii. All cable/wires shall be marked with good quality letter and number ferrules of proper sizes so that the cables can be identified easily. iii. Cable terminations shall be made with suitable cable lugs & sockets etc, crimped properly and passed through brass compression type cable glands at the entry & exit point of the cubicles. 1.5.1 <u>Compliances and Certification</u> i. Irrespective of utilization voltage and current rating all type of power cables shall be minimum of 1100 V grade PVC insulated conforming to IS 1554 / IS 694 for working voltage less than 150 V. ii. The cables shall be adequately insulated for the voltage required and shall be suitably color coded for the required service. iii. The cable ends shall be terminated with adequate size copper lugs and sockets etc, single/double compression cable glands. Cable glands shall be of robust construction capable of clamping cable and cable armour (for armoured cables) firmly without injury to insulation. The metallic glands shall be earthed at two locations. Suitable lock type crimping lugs shall be used for cable end terminations. Where cables are raising from ground, suitable PVC pipe guarding shall be provided for cable raising with sealing of the guarding PVC pipe including a suitable clamp.

			recommendations and IS: 1255. iv. Data sheets of individual cable sizes shall be submitted for approval by Owner. Drum numbers and drum length details shall be submitted with each consignment. v. Cable terminations shall be made with suitable cable lugs & sockets etc, crimped properly and passed through brass compression type cable glands at the entry & exit point of the cubicles. vi. All cable/wires shall be provided with Aluminium tags only. The marking on tags shall be done with good quality letter and number ferrules of proper sizes so that the cables can be identified easily. vii. Cable end terminations and joint kits shall comply with the latest version of the relevant IS standard. viii. The cable ends shall be terminated with adequate size copper lugs and sockets etc, single/double compression cable glands. Cable glands shall be of robust construction capable of clamping cable and cable armour (for armoured cables) firmly without injury to insulation. The metallic glands shall be earthed at two locations. Suitable lock type crimping lugs shall be used for cable end terminations. Where cables are raising from ground, suitable PVC pipe guarding shall be provided for cable raising with sealing of the guarding PVC pipe including a suitable clamp. ix. Data sheets of the joints and kits shall be submitted for approval by Owner.		
17.	Clause no. 1.6	69	***Earthing and Surge Protection*** i. The photovoltaic modules, BOS and other components of power plant requires adequate earthing for protection against any serious faults as guided by IEC 60364. The earthing for array and LT power system shall be made with GI pipe, 4.5 meter long, 40 mm diameter including accessories and providing masonary enclosure with cast iron cover plate having locking arrangements, watering pipe using charcoal and salt as per provision of IS:3043.		Clause to be modified. **Revised Clause:** ***Earthing and Surge Protection*** i. The system requires adequate earthing for protection against any serious faults as guided by IEC 60364. The earthing system shall be made with GI pipe, watering pipe using charcoal and salt as per provision of IS:3043.

			ii. Necessary provision shall be made for bolted isolating joints of each earthing pit for periodic checking of earth resistance. iii. Each string / array and MMS of the plant shall be grounded properly. The array structures are to be connected to earth pit as per IS standards. iv. The complete earthing system shall be mechanically and electrically connected to provide independent return to earth. v. For each earth pit, a necessary test point shall be provided. vi. In compliance to rule 11 and 61 of Indian Electricity Rules, 1956 (as amended upto date), all non-current carrying parts shall be earthed with two separate and distinct earth continuity conductors to an efficient earth electrode. vii. Bidders shall provide necessary drawings / designs for earthing system.		ii. Bidders shall provide necessary drawings / designs for earthing system.
18.	Clause no. 1.7	70	Energy Meter		**Clause is deleted.**
19.	Clause no. 1.8 (xviii)	71	The Contractor should design the structure height considering highest flood level at the site. The minimum clearance between the lower edge of the module and the ground shall be the higher of (i) above highest flood level at the site and (ii) minimum 800 mm.		Module, Cables, earthing, JBs , batteries (all supply) as per MNRE Guideline and IS Standard
20.	Clause no. 1.9	71	***Sign Boards and Name Plates*** 1.9.1. Contractor shall provide sign boards and danger plates at every electrical installations. The Contractor shall provide to the Employer, detailed specifications of the sign boards.		Clause needs to be modified **Revised Clause:** 1.9.1. Contractor shall provide name plate mentioning the system name, system rating, no. of home light system and GEC name. The Contractor shall provide to the Employer, detailed specifications of such name plate.
21.	Clause no. 1.10	71	**Fencing of Solar PV Micro-Grid Installations** 1.10.1. Each of the Solar PV Hybrid Power plant shall be protected by chain link fencing. The minimum height of the fencing shall be 1.5 meter 18 gauge fencing is to be installed with fixing aligning vertical 50 x 50 x 6mm ISA, 2.5m centre to centre and with strut		Fencing is not required. **Clause is deleted.**

			angle at every 5 span. Fencing shall be top concertina wiring. It shall have proper metal gate of 100 mm X 50 mm x 10 mm thick angle with similar metal frame structure. The frame structure shall be having appropriate RCC footing designed based on local soil condition. The gate shall be installed on the frame structure through appropriate hinges and the gate shall have locking arrangement. Further, entire structure shall make use of GI material with zinc coating of 110 mm thick. A detailed drawing of the same shall be submitted by Contractor for review and approval from Employer / Consultant.	
22.	Clause no. 1.11	72	***Mounting of Solar Hybrid Inverters / JBs*** 1.11.1. Each of the solar hybrid inverters / Battery / Other Electronics shall be installed in community buildings like milk collection centres / mosques / community halls etc. If such common places are not found, inverter can be mounted on MMS itself through proper clamps and bolts. However, batteries and other electronic devices shall not be kept outside. Contractor shall identify neighbouring huts / homes and house in appropriate metal enclosure. In case if the same needs to be installed under open sky condition, Contractor shall plan for the metal cabinet with proper ventilation and locking arrangement designed to meet ingress protection requirement of IP 65.	**Revised clause:** ***Mounting of Electronics*** 1.11.1 Each of the Charge controller/ Battery / Other tronics shall be installed in beneficiaries premises under ected and ventilated environment. If such common places not found, these can be mounted on the pole itself through per clamps and bolts. However, batteries and other tronic devices shall not be kept outside. Contractor shall tify neighbouring huts / homes and house and place the eries in appropriate protective metal enclosure. In case if same needs to be installed under open sky condition, tractor shall plan for the metal cabinet with proper ilation and locking arrangement designed to meet ingress ection requirement of IP 65.
23.	Clause no. 1.12.1	72	All enclosures for junction box, inverter, control panel shall have minimum ingress protection of IP 65 for outdoor installations and IP21 for indoor installations. Further, the equipments to be kept indoors shall have sufficient protection to avoid accidental contact with dangerous parts by occupants / users. Also the enclosures shall have lock-key type of arrangement if it is not installed in protected area. Moreover, the material of construction shall be appropriate to provide 25 years of service life. The notches to open the enclosures and all nuts / bolts, clamps and other hardwares shall be strictly of SS or equivalent to	Word “Inverter” needs to be deleted. **Revised clause:** All enclosures for junction box, charge controller, control panel shall have minimum ingress protection of IP 65 for outdoor installations and IP21 for indoor installations. Further, the equipments to be kept indoors shall have sufficient protection to avoid accidental contact with dangerous parts by occupants / users. Also the enclosures

			provide long service life.		shall have lock-key type of arrangement if it is not installed in protected area. Moreover, the material of construction shall be appropriate to provide 25 years of service life. The notches to open the enclosures and all nuts / bolts, clamps and other hardwares shall be strictly of SS to provide long service life.
DETAILED SPECIFICATIONS FOR Standalone off grid portable Solar home light systems **SCOPE OF WORK**					
24.	Clause Paragraph	72	A home lighting system aims at providing solar electricity for operating lights and/or fan or energizing a DC operated portable TV set for specified hours of operation per day.		**Revised Clause:** A home lighting system aims at providing solar electricity for operating LED fixtures for specified hours of operation per day.
25.	Clause no 1.1 (iv)	72	System shall have mobile phone charging socket, TV connection socket and for charging of torch.		**Clause is deleted.**