

**CORRIGENDUM**

In the light of pre-bid meeting held on 09.07.2016 with prospective bidders & queries received, JREDA has decided to make following amendment in the NIB No. **16/JREDA/ SWPS/2HP-AC/Sub/2016-17** regarding **“Design, Supply, Installation, Testing & Commissioning including 5 years Comprehensive Maintenance Contract (CMC) of 200 nos. of 2 HP AC Submersible Solar Water Pumping Systems (SWPS) capacity on Turnkey basis for irrigation purpose in the state of Jharkhand.”**

Section/ Annexure	Original Criteria	Read as/ Amendment																		
E-procurement Notice	<p><b>Page no. 3 of the NIB: Point No. 6, 7 &amp; 8 of e-Procurement Notice:</b></p> <table border="1" data-bbox="262 630 1010 946"> <tr> <td data-bbox="262 630 354 721">6</td> <td data-bbox="363 630 674 721">Last date &amp; time for receipt of online bids</td> <td data-bbox="682 630 1010 721"><b>22.07.2016 (Friday)</b> upto 05:00 PM</td> </tr> <tr> <td data-bbox="262 727 354 850">7</td> <td data-bbox="363 727 674 850">Submission of original copies of Bid fee &amp; EMD (Offline)</td> <td data-bbox="682 727 1010 850"><b>22.07.2016</b> and <b>23.07.2016</b> up to 5.00 P.M.</td> </tr> <tr> <td data-bbox="262 857 354 946">8</td> <td data-bbox="363 857 674 946">Technical Bid Opening Date</td> <td data-bbox="682 857 1010 946"><b>25.07.2016 (Monday)</b> at 03:00 PM</td> </tr> </table>	6	Last date & time for receipt of online bids	<b>22.07.2016 (Friday)</b> upto 05:00 PM	7	Submission of original copies of Bid fee & EMD (Offline)	<b>22.07.2016</b> and <b>23.07.2016</b> up to 5.00 P.M.	8	Technical Bid Opening Date	<b>25.07.2016 (Monday)</b> at 03:00 PM	<p><b>Page no. 3 of the NIB: Point No. 6, 7 &amp; 8 of e-Procurement Notice:</b></p> <table border="1" data-bbox="1123 630 1906 1011"> <tr> <td data-bbox="1123 630 1215 721">6</td> <td data-bbox="1224 630 1535 721">Last date &amp; time for receipt of online bids</td> <td data-bbox="1543 630 1906 721"><b>27.07.2016 (Wednesday)</b> upto 05:00 PM</td> </tr> <tr> <td data-bbox="1123 727 1215 883">7</td> <td data-bbox="1224 727 1535 883">Last date &amp; time of submission of original copies of Bid fee &amp; EMD (Offline)</td> <td data-bbox="1543 727 1906 883"><b>27.07.2016</b> and <b>28.07.2016</b> up to 5.00 P.M.</td> </tr> <tr> <td data-bbox="1123 889 1215 1011">8</td> <td data-bbox="1224 889 1535 1011">Date &amp; time for opening of Technical Bid</td> <td data-bbox="1543 889 1906 1011"><b>29.07.2016 (Friday)</b> at 03:00 PM</td> </tr> </table>	6	Last date & time for receipt of online bids	<b>27.07.2016 (Wednesday)</b> upto 05:00 PM	7	Last date & time of submission of original copies of Bid fee & EMD (Offline)	<b>27.07.2016</b> and <b>28.07.2016</b> up to 5.00 P.M.	8	Date & time for opening of Technical Bid	<b>29.07.2016 (Friday)</b> at 03:00 PM
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Section-3	<p><b>Page no. 7 of the NIB, Clause no. 1 of Part-I (the Technical conditions) of Notice Inviting Bid:</b> The bidder can be <b>(a)</b> MNRE approved Solar PV Channel Partner /MNRE approved solar manufacturer/MNRE approved PV System integrator, <b>(b)</b> a registered manufacturing company/Firm/ Corporation in India (including MSMEs of Jharkhand) manufacturing at least one of the major components of the solar water pumping system). The bidder shall furnish either relevant MNRE certificate or concerned Industry Department certificate clearly indicating that they are manufacturers of SPV Power Plant including SPV Cells/ Modules or pumps or PV System Electronics as applicable.</p>	<p><b>Page no. 7 of the NIB, Clause no. 1 of Part-I (the Technical conditions) of Notice Inviting Bid:</b> The bidder can be <b>(a)</b> MNRE approved Solar PV Channel Partner /MNRE approved solar manufacturer/MNRE approved PV System integrator</p> <p align="center"><b>or</b></p> <p><b>(b)</b> a registered manufacturing company/Firm/ Corporation in India (including MSMEs of Jharkhand) manufacturing at least one of the major components of the solar water pumping system). The bidder</p>																		

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Section-3	<p><b>Page no. 8 of the NIB, Clause no. 5 of Part-I (the Technical conditions) of Notice Inviting Bid:</b> The bidder must be in possession of valid test report of Solar Water Pumping System (PV module, Pump, Controller &amp; Inverter) from any test centre approved by MNRE.</p> <p>The latest test certificate should confirm that Solar Pumps are as per MNRE specifications 2015-16. <b>The test certificate issued before 01.04.2015 will lead to outright rejection of the BID.</b> All the product should be as per <b>JNNSM/MNRE guidelines applicable for 2015-16.</b> The bidder has to supply the modules of same make, specifications and standard brand for which test reports have been submitted in the tender otherwise the work order &amp; agreement shall be terminated, the security deposit shall be forfeited and the bidder firms shall be black listed. <b>The test report of SPV Pumping System must be on the name of bidder. Test report issued by test centers is not transferable.</b></p> <p><i>In case the bidder during the period of execution of the work is not able to supply solar PV module/pump as per the make in the valid test certificate submitted in the bid due to unavoidable reasons, the successful bidders may submit in writing with valid reasons to JREDA. JREDA shall examine the reasons and if the reasons for changing the make of the solar PV module/pump is found valid then the agency may be allowed to change, but the bidders shall have to submit the valid fresh test certificate in their name with the changed</i></p>	<p><b>Page no. 8 of the NIB, Clause no. 5 of Part-I (the Technical conditions) of Notice Inviting Bid:</b> The bidder must be in possession of valid test report of Solar Water Pumping System (PV module, Pump, Controller &amp; Inverter) from any test centre approved by MNRE.</p> <p>The latest test certificate should confirm that Solar Pumps are as per MNRE specifications 2015-16 <b>(Model-II).</b> All the product should be as per <b>JNNSM/MNRE guidelines applicable for 2015-16.</b> The bidder has to supply the modules of same make, specifications and standard brand for which test reports have been submitted in the tender otherwise the work order &amp; agreement shall be terminated, the security deposit shall be forfeited and the bidder firms shall be black listed. <b>The test report of SPV Pumping System must be on the name of bidder. Test report issued by test centers is not transferable.</b></p> <p><i>In case the bidder during the period of execution of the work is not able to supply solar PV module/pump as per the make in the valid test certificate submitted in the bid due to unavoidable reasons, the successful bidders may submit in writing with valid reasons to JREDA. JREDA shall examine the reasons and if the reasons for changing the make of the solar PV module/pump is found valid then the agency may be allowed to change, but the bidders shall have to submit the valid fresh test certificate in their name with the changed make of solar PV module/pump. No extra time for execution</i></p>

	<i>make of solar PV module/pump. No extra time for execution of work will be permitted for this change in the make of a component of the Solar Water Pumping System (SWPS).</i>	<i>of work will be permitted for this change in the make of a component of the Solar Water Pumping System (SWPS)</i>
Section-3		<p><b>In Page no. 9 of the NIB, New Clause no. 15 of Part-I (the Technical conditions) of Notice Inviting Bid:</b></p> <p><b>For General Bidders:</b> Bidder should have at least installed and commissioned <b>10 nos.</b> of Solar Photovoltaic Water Pumping System of any capacity.</p> <p><b>For MSME Bidders:</b> Bidder should have at least installed and commissioned <b>05 nos.</b> of Solar Photovoltaic Water Pumping System <b>of any capacity.</b></p>
Section-4	<p><b>Page no. 13 of the NIB, Clause no. g of 4.4A of Instruction to Bidders (ITB)</b></p> <p>The bidder can be <b>(a)</b> MNRE approved Solar PV Channel Partner /MNRE approved solar manufacturer/MNRE approved PV System integrator, <b>(b)</b> a registered manufacturing company/Firm/ Corporation in India (including MSMEs of Jharkhand) manufacturing at least one of the major components of the solar water pumping system). The bidder shall furnish either relevant MNRE certificate or concerned Industry Department certificate clearly indicating that they are manufacturers of SPV Power Plant including SPV Cells/ Modules or pumps or PV System Electronics as applicable.</p> <p><b>Authorized dealers of companies/firms/corporations and subcontractors are not eligible to participate.</b></p>	<p><b>Page no. 13 of the NIB, Clause no. g of 4.4A of Instruction to Bidders (ITB)</b></p> <p>The bidder can be <b>(a)</b> MNRE approved Solar PV Channel Partner /MNRE approved solar manufacturer/MNRE approved PV System integrator <b>or (b)</b> a registered manufacturing company/Firm/ Corporation in India (including MSMEs of Jharkhand) manufacturing at least one of the major components of the solar water pumping system). The bidder shall furnish either relevant MNRE certificate or concerned Industry Department certificate clearly indicating that they are manufacturers of SPV Power Plant including SPV Cells/ Modules or pumps or PV System Electronics as applicable.</p> <p><b>Authorized dealers of companies/firms/corporations and subcontractors are not eligible to participate.</b></p>
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Section-4		<p><b>In Page no. 14 of the NIB, New Clause no. I of 4.4A of Instruction to Bidders (ITB)</b></p> <p><b>For General Bidders:</b> Bidder should have at least installed and commissioned of 10 nos. of Solar Photovoltaic Water Pumping System of any capacity.</p> <p><b>For MSME Bidders:</b> Bidder should have at least installed and commissioned of 05 nos. of Solar Photovoltaic Water Pumping System of any capacity.</p>

<p>Section-5</p>	<p><b>Page no. 21 of the NIB, Clause no. 2.0 (Scope of work) of General Terms &amp; Conditions:</b>  The Scope of work for “<b>Design, Supply, Installation, Testing &amp; Commissioning including 5 years Comprehensive Maintenance Contract (CMC) of 200 nos. of 2 HP AC Submersible Solar Water Pumping Systems (SWPS) capacity on Turnkey basis for irrigation purpose in the state of Jharkhand</b>” complete set in all respects along with one set of operational instruction cum maintenance manual (both English and Hindi) for each set and delivery on FOR destination/site (door delivery) basis across the State of Jharkhand as per the direction of JREDA. The list of destinations/consignees will be given to the successful bidder by JREDA before the start of dispatch. <b><i>The scope of work shall include supply of suitable capacity solar pv module, solar inverter/ VFD/ controller with remote monitoring arrangement, AC/DC pumps of suitable capacity, GI mounting structure, HDPE Pipe of required length/size, submersible cable etc. as per specification.</i></b></p> <p><b><i>In case any component of the SWPS is stolen after commissioning and handing over the Solar Water Pumping System (SWPS) to the beneficiary, the replacement of the same will not be the part of CMC. It will be the responsibility of the beneficiary farmer.</i></b></p> <p><b><i>It will be the responsibility of the beneficiary to provide 4”/6” bore well, as per the requirement of the system opted (make of the manufacturer), in good working condition.</i></b></p>	<p><b>Page no. 21 of the NIB, Clause no. 2 (Scope of work) of General Terms &amp; Conditions:</b>  The Scope of work for “<b>Design, Supply, Installation, Testing &amp; Commissioning including 5 years Comprehensive Maintenance Contract (CMC) of 200 nos. of 2 HP AC Submersible Solar Water Pumping Systems (SWPS) capacity on Turnkey basis for irrigation purpose in the state of Jharkhand</b>” complete set in all respects along with one set of operational instruction cum maintenance manual (both English and Hindi) for each set and delivery on FOR destination/site (door delivery) basis across the State of Jharkhand as per the direction of JREDA. The list of destinations/consignees will be given to the successful bidder by JREDA before the start of dispatch. <b><i>The scope of work shall include supply of suitable capacity solar pv module, controller/inverter with remote monitoring arrangement, AC pumps of suitable capacity, GI mounting structure, HDPE Pipe of required length/size, submersible cable etc. as per specification.</i></b></p> <p><b><i>In case any component of the SWPS is stolen after commissioning and handing over the Solar Water Pumping System (SWPS) to the beneficiary, the replacement of the same will not be the part of CMC. It will be the responsibility of the beneficiary farmer.</i></b></p> <p><b><i>It will be the responsibility of the beneficiary to provide 4”/6” bore well, as per the requirement of the system opted (make of the manufacturer), in good working condition.</i></b></p>
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<p>Section-5</p>	<p><b>Page no. 22 &amp; 23 of the NIB, Clause no. 6.0 (c) (Payment terms &amp; conditions) of General Terms &amp; Conditions:</b></p> <p>Rest <b>10%</b> of the Contract Price shall be paid @<b>2%</b> of the Contract Price on completion of every one year period of the 5 year CMC period, after submission of following documents::</p> <ul style="list-style-type: none"> <li>i) Copy of Original Commercial invoice raised at the time of supply in triplicate (1+2).</li> <li>ii) Submission of quarterly reports of CMC undertaken by the manufacturer <b>as per Annexure-14.</b></li> </ul> <p>The payment for the items to be procured/installed will be released on receipt of the corresponding share as has been provided in the approved scheme of JREDA either from MNRE, Govt. of Jharkhand, beneficiary or other concerned.</p> <p><b>“The efforts will be made by JREDA to make available the 100% payment to the agency within three months against satisfactory completion of the work.”</b></p>	<p><b>Page no. 22 &amp; 23 of the NIB, Clause no. 6.0 (c) (Payment terms &amp; conditions) of General Terms &amp; Conditions:</b></p> <p>Rest <b>10%</b> of the Contract Price shall be paid @<b>2%</b> of the Contract Price on completion of every one year period of the 5 year CMC period, after submission of following documents::</p> <ul style="list-style-type: none"> <li>i) Copy of Original Commercial invoice raised at the time of supply in triplicate (1+2).</li> <li>ii) Submission of quarterly reports of CMC undertaken by the manufacturer <b>as per Annexure-14.</b></li> </ul> <p>The above 10% CMC payment can be released on submission of 5 nos. of Bank Guarantee which shall be released @ 2% of the contract price on successful completion of every year CMC.</p> <p>The payment for the items to be procured/installed will be released on receipt of the corresponding share as has been provided in the approved scheme of JREDA either from MNRE, Govt. of Jharkhand, beneficiary or other concerned.</p> <p><b>“Efforts will be made by JREDA to make available the payment to the agency within 30 days after submission of bill for the supply of materials with all required documents and within 60 days after submission of bill for the installation &amp; commissioning of SWPS with all required documents against satisfactory completion of the work.”</b></p>
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2. Section-6 (Technical Specification) is amended as following:

**Technical Specification**

**Solar Photovoltaic Water Pumping Systems  
(As per MNRE – JNNSM-2015-16)**

**NIB No: 16/JREDA/SWPS/2HP-AC/Sub/2016-17**

**I. INTRODUCTION**

A Solar Photovoltaic (SPV) Water Pumping System consists of:

- Motor Pump Set (Surface or submersible) :
  - A.C. Induction Motor Pump Set with a suitable inverter
- Electronics :
  - Maximum Power Point Tracker (MPPT)
  - Inverter for A.C. Motors
  - Electronic Protections.
- Interconnect Cables and
- “On-Off” Switch \

**II. PERFORMANCE SPECIFICATIONS AND REQUIREMENTS**

Solar PV Water Pumps with PV module capacity of 1800 Wp may be installed on a suitable bore-well.

Under the “Average Daily Solar Radiation” condition of 7.15 KWh / sq.m. on the surface of PV array (i.e. coplanar with the PV Modules), the minimum water output from a Solar PV Water Pumping System at different “Total Dynamic Heads” should be as specified below :

**For A.C. Induction Motor Pump Set with a suitable Inverter :**

- (i) 90 liters of water per watt peak of PV array, from a Total Dynamic Head of 10 metres (Suction head, if applicable, minimum of 7 metres) and with the shut off head being at least 12 metres.
- (ii) 45 liters of water per watt peak of PV array, from a Total Dynamic Head of 20 metres (Suction head, if applicable, up to a maximum of 7 metres) and with the shut off head being at least 25 metres.
- (iii) 32 liters of water per watt peak of PV array, from a Total Dynamic Head of 30 metres and the shut off head being at least 45 metres.

- (iv) 19 liters of water per watt peak of PV array, from a Total Dynamic Head of 50 metres and the shut off head being at least 70 metres.
- (v) 13 liters of water per watt peak of PV array, from a Total Dynamic Head of 70 metres and the shut off head being at least 100 metres.
- (vi) **8.5 liters of water per watt peak of PV array, from a Total Dynamic Head of 100 metres and the shut off head being at least 150 metres.**

The actual duration of pumping of water on a particular day and the quantity of water pumped could vary depending on the solar intensity, location, season, etc.

Indicative performance specifications for the Shallow and Deep well SPV Water Pumping Systems are given in the Annexure II.

### **III. PV ARRAY**

The SPV water pumping system should be operated with a PV array capacity of 1800 Wp, measured under Standard Test Conditions (STC). Sufficient number of modules in series and parallel could be used to obtain the required PV array power output. The power output of individual PV modules used in the PV array, under STC, should be a minimum of 125 Watts peak, with adequate provision for measurement tolerances. Use of PV modules with higher power output is preferred.

Indigenously produced PV module (s) containing mono/ multi crystalline silicon solar cells should be used in the PV array for the SPV Water Pumping systems.

- Modules supplied with the SPV water pumping systems should have certificate as per IEC 61215 specifications or equivalent National or International/ Standards.
- Modules must qualify to IEC 61730 Part I and II for safety qualification testing.
- The efficiency of the PV modules should be minimum 14% and fill factor should be more than 70%.
- The terminal box on the module should have a provision for "Opening" for replacing the cable, if required.
- There should be a Name Plate fixed inside the module which will give:
  - a. Name of the Manufacturer or Distinctive Logo.
  - b. Model Number
  - c. Serial Number
  - d. Year of manufacture

### **IV. MOTOR PUMP-SET**

The SPV water pumping systems may use any of the following types of motor pump sets:

- a. Submersible motor pump set
- b. Floating motor pump set



- c. Any other type of motor set approval from Test Centers of Ministry.
- The “Motor Pump Set” should have a capacity of **2 hp and** should have the following features :
  - The mono block AC centrifugal motor pump set with the impeller mounted directly on the motor shaft and with appropriate mechanical seals which ensures zero leakage.
  - The motor of the capacity of 2 Hp should be AC. The suction and delivery head will depend on the site specific condition of the field.
  - Submersible pumps could also be used according to the dynamic head of the site at which the pump is to be used.
- It is recommended that all parts of the pump and the motor of the submersible pumps should be made of stainless steel.
  - The manufacturers of pumps should self certify that, the pump and ***all external parts of motor used in submersible pump which are in contact with water, are of stainless steel.*** The pumps used for solar application should have a 5 years warranty so it is essential that the construction of the pump be made using parts which have a much higher durability and do not need replacement or corrode for at least 5 years.
- ***Provision for remote monitoring of the installed pumps must be made in the controllers or the inverters either through an integral arrangement or through an externally fitted arrangement. It should be possible to ascertain the daily water output, the power generated by the PV array, the UP TIME of the pump during the year, Number of days the pump was unused or under breakdown/repairs.***
- The following details should be marked indelibly on the motor pump set
  - a. Name of the Manufacturer or Distinctive Logo.
  - b. Model Number.
  - c. Serial Number.
- The Suction/delivery pipe (GI/HDPE), electric cables, floating assembly, civil work and other fittings required to install the Motor Pump Set.

#### **V. MOUNTING STRUCTURES and TRACKING SYSTEM.**

The PV modules should be mounted on metallic structures of adequate strength and appropriate design, which can withstand load of modules and high wind velocities up to 150 km per hour. The support structure used in the pumping system should be hot dip galvanized iron with minimum 80 micron thickness.

To enhance the performance of SPV water pumping systems, manual or passive or auto tracking system **must** be used. For manual tracking, arrangement for seasonal tilt angle adjustment and three times manual tracking in a day should be provided.

#### **VI. MOUNTING STRUCTURES and TRACKING SYSTEM.**

- Maximum Power Point Tracker (**MPPT**) should be included to optimally use the Solar panel and maximize the water discharge.
- Inverter could be used, if required, to operate an A.C. Pump. The inverter must have IP 54 protection or must be housed in a cabinet having at least **IP54** protection.

- Adequate protections should be incorporated against dry operation of motor pump set, lightning, hails and storms.
- Full protection against open circuit, accidental short circuit and reverse polarity should be provided.

#### **VII. WARRANTY.**

The PV Modules must be warranted for output wattage, which should not be less than 90% at the end of 10 years and 80% at the end of 25 years. The whole system including submersible/ surface pumps shall be warranted for 5 years. Required Spares for trouble free operation during the Warrantee period should be provided along with the system.

#### **VIII. OPERATION AND MAINTENANCE MANUAL.**

An Operation and Maintenance Manual, in English and the local language, should be provided with the solar PV pumping system. The Manual should have information about solar energy, photovoltaic, modules, AC motor pump set, tracking system, mounting structures, electronics and switches. It should also have clear instructions about mounting of PV module, DO's and DONT's and on regular maintenance and Trouble Shooting of the pumping system. Name and address of the person or Centre to be contacted in case of failure or complaint should also be provided. A warranty card for the modules and the motor pump set should also be provided to the beneficiary.

#### **IX. NOTES.**

- Wherever the "Water table" or the level of water in the reservoir or the water source (e.g. Diggie) from which the water is to be pumped, is within 10 metres depth, 'Surface Motor Pump sets" should be preferred.
- The type of pump set used must match the total dynamic head requirement of the site (i.e. the location at which it is installed). Moreover, it should be appropriately tested and certified by the authorized test centres of the Ministry to meet the performance and water discharge norms specified in section II above.
- There should not be any compulsion to use only one or the other type of Motor-pump set. The beneficiary may select an appropriate Model (i. e. Capacity of PV Array and Type of Motor Pump Set) as per site requirement.

**Indicative Technical Specification of Solar Deep Well (submersible) Pumping Systems:**

**With A.C. Induction Motor Pump Set and a suitable Inverter:**

Description	Model-II
PV array	1800 Wp
Motor capacity	2 hp submersible with controller
Shut Off Dynamic head	45 meters
Water output*	57,600 liters per day from a total head of 30 meters

\*Water output figures are on a clear sunny day with three times tracking of SPV panel, under the "Average Daily Solar Radiation" condition of **7.15 KWh/sq.m. on the surface of PV array (i.e. coplanar with the PV Modules).**

Notes:

1. For higher or lower head / PV capacity, or in between various models; water output could be decided as per the clause II. (i.e. performance specifications and requirements) specified earlier.
2. If surface pumps are used in lieu of submersible pumps, the water output must match that of the submersible pumps as specified in this table.
3. Module mounting structure shall be MS hot dipped galvanized, with a facility of manual tracking at least three times a day.

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3. Changes made as above in technical specification may be read accordingly for similar changes in related technical specification.
  4. The Corrigendum shall form the integral part of the NIB.

Sd/-  
Director  
JREDA, Ranchi