JHARKHAND RENEWABLE ENERGY DEVELOPMENT AGENCY
Address - 3rd Floor, SLDC Building, Kusai, Doranda, Ranchi-834002. Jharkhand
Phone No. +91-0651-2491161 Fax No. +91-0651-2491165
Email: info@jreda.com

EOI Reference No. – 08/JREDA/EOI/SC/22-23

For

Selection of agency for Aerial Photography (Drone Survey) for mapping Rooftop PV, Solar Generation Estimation & Shading analysis including system sizing of each rooftop with of Giridih City Under Solar City Scheme.

Govt. of Jharkhand

Energy Department

Jharkhand Renewable Energy Development Agency (JREDA)

3rd Floor, S.L.D.C. Building, Kusai Colony, Doranda, Ranchi-834002.
Ph.: 0651-2491161, Fax: 0651-2491165,
E-mail: info@jreda.com; Website: www.jreda.com

e-Procurement Notice (Urgent)

Tender Reference No.: 08/JREDA/EOI/SC/22-23 **Dated: 03.06.2022**

1	Name of the work	**Selection of agency for Aerial Photography (Drone Survey) for mapping Rooftop PV, Solar Generation Estimation & Shading analysis including system sizing of each rooftop with of Giridih City Under Solar City Scheme.**
2	Period of Engagement	06 (Six) Months
3	Date of publication of EoI on website: http:// jharkhandtenders.gov.in	**06.06.2022 (Monday)**
4	Date & time of Pre-bid meeting	**13.06.2022 (Monday)** at **1:00 P.M.**
5	Last date & time for receipt of online bids	**21.06.2022 (Tuesday)** up to **02:00 P.M.**
6	Bid Opening Date	**22.06.2022 (Wednesday)** at **03:00 P.M.**
7	Name & address of office inviting tender	Director, Jharkhand Renewable Energy Development Agency (JREDA) 3rd Floor, SLDC Building, Kusai, Doranda, Ranchi- 834002 (Jharkhand)
8	Contact no. of procurement officer	0651-2491163/61
9	Helpline no. of e-procurement	0651-2491163/61

Any corrigendum/addendum can be seen on website: http://jharkhandtenders.gov.in & www.jreda.com. Further details can be seen on website: http://jharkhandtenders.gov.in & www.jreda.com

Sd/-
Director,
JREDA, Ranchi

JHARKHAND RENEWABLE ENERGY DEVELOPMENT AGENCY
Address - 3rd Floor, SLDC Building, Kusai, Doranda, Ranchi-834002. Jharkhand
Phone No. +91-0651-2491161 Fax No. +91-0651-2491165
Email: info@jreda.com

Jharkhand Renewable Energy Development Agency (JREDA) is an autonomous body under the Societies Registration Act 21, 1860 registered on 19th February 2001 for the development and deployment of New and Renewable Energy resources for supplementing the energy requirements of the state and to generate public awareness in facilitating deployment of new and renewable energy systems. JREDA is a state nodal agency for the implementation of renewable energy projects by means of financial incentives made available by the Ministry of New and Renewable Energy (MNRE), Govt. of India and Government of Jharkhand and State Designated Agency (SDA) for implementation of Energy Efficiency projects by means of financial incentives made available by Bureau of Energy Efficiency (BEE).

Assignment title:

Arial Photometry (Drone Survey) for mapping Rooftop PV, Solar Generation Estimation & shading analysis including stem sizing of each rooftop with of Giridih City under Solar City Scheme

JHARKHAND RENEWABLE ENERGY DEVELOPMENT AGENCY now invites eligible firms to express their interest in providing their services. Interested bidder should provide information demonstrating that they have the required qualifications and relevant experience to perform the work and share relevant details of similar work/assignments undertaken/executed. Short-listing criteria are available in Annexure – 1. The firm will be selected in accordance with meeting the short-listing criteria.

Further information can be obtained at the address below during office hours [10:00 to 18:00 hours].

Director, JHARKHAND RENEWABLE ENERGY DEVELOPMENT AGENCY
3rd Floor, SLDC Building, Kusai, Doranda, Ranchi-834002, Jharkhand
Email: info@jreda.com

Annexure – I: Eligibility Criteria

S. No.	Basic Requirement	Specific Requirement	Documents Required
1	Entity	Bidder should be a Single Entity means a limited company (as defined in the Companies Act, 1956), OR a registered partnership firm (registered under section 59 of the Partnership Act, 1932) OR a limited liability partnership (under the Limited Liability Partnership Act, 2002)/ OR a Proprietorship firms/Registered trust/society under Act.	Copy of supporting document for work in the field of aerial imagery-based rooftop solar potential.
2	GST,Registration & PAN No.	Bidder should have valid GST Registration & PAN No.	GST Registration & PAN No.certificate.
3	Essential work experience	i. Bidder should have experience in the field of aerial imagery-based rooftop solar potential assessment for cities and towns in India. ii. Bidder should must have completed Aerial survey based Rooftop Solar potential assessment exercise for Distribution companies or Any State Nodal Agency (SNA) like BREDA, JREDA, OREDA etc iii. Bidder must have completed at least 1000 sq km of aerial survey for Rooftop solar potential assessment in DISCOM/SNA. iv. Bidder should have responded to EOI in this regard and subsequently Submit a technical presentation showing the expertise in related field as required regarding experience.	Details of experience supported by proper documents. & Copy of performance certificate. & Technical Presentation
4	Estimated Cost of Project	**The project will be at no cost to Government of Jharkhand/JREDA.** Agency will bear the cost of the project and only technical/administrative support will be provided by JREDA.	

JREDA reserves right to accept or reject any or all "Expression of Interest" without assigning any reasons.

The total number of Empaneled agencies will be based on the requirement of JREDA.

Exact and complete corporate/registered/office address, business address, telephone numbers, fax numbers, E-mail should be provided by the bidder. For the bidder of foreign registry, indicate if there is any branch office(s) established in India with details in aforesaid manner.

JHARKHAND RENEWABLE ENERGY DEVELOPMENT AGENCY
Address - 3rd Floor, SLDC Building, Kusai, Doranda, Ranchi-834002. Jharkhand
Phone No. +91-0651-2491161 Fax No. +91-0651-2491165
Email: info@jreda.com

1. History

Jharkhand Renewable Energy Development Agency (JREDA) is an autonomous body under the Societies Registration Act 21, 1860 registered on 19th February 2001 for the development and deployment of New and Renewable Energy resources for supplementing the energy requirements of the state and to generate public awareness in facilitating deployment of new and renewable energy systems. JREDA is a state nodal agency for the implementation of renewable energy projects by means of financial incentives made available by the Ministry of New and Renewable Energy (MNRE), Govt. of India and Government of Jharkhand and State Designated Agency (SDA) for implementation of Energy Efficiency projects by means of financial incentives made available by Bureau of Energy Efficiency (BEE).

For the creation of a conductive environment for the development of Solar Energy in the state, State Government had notified solar policy on 10th August 2015. The policy titled, "**Jharkhand State Solar Power Policy 2022**" would remain in operation till 5 years or till the issuance of any new policy. Solar Power Projects commissioned under this policy would be eligible for the incentives declared under this policy for 10 years. For the promotion of rooftop solar programs and to bring investment in rooftop solar market in the state, state government has notified "**Jharkhand Solar Rooftop Policy, 2018**". Rooftop specific solar policy covers clauses of mandatory installation and virtual net metering which would help peaking up of the solar rooftop installations and making Jharkhand a self-sustained solar energy market.

State of Jharkhand has potential for the development of other renewable energy sources like Small Hydel Plant (SHPs), Bio-mass based plants etc. JREDA has launched several schemes for the development of renewable energy portfolio across the state and also exploring opportunities for the development of new renewable energy sources.

2. Existing Infrastructure

In grid connected rooftop or small SPV system, the DC power generated from SPV panel is converted to AC power using power conditioning unit and is fed to the grid either of 33 kV/11 kV three phase lines or of 415V/230V three/single phase line depending on the local technical and legal requirements.

These systems generate power during the daytime which is utilized by powering captive loads and feed excess power to the grid. In case, when power generated is not sufficient, the captive loads are served by drawing power from the grid.

Considering the fact that most of Jharkhand is covered with fertile lands/plains and rich mines, further development of ground-mounted PV might lead to conflicts in terms of agriculture, just transitions or local ecology. This paves the way to focus on the RTPV potential of the state and there is a need for a roadmap to address the aforementioned issues and prepare a strategy for scaling up RTPV installations. This will tremendously help

the state to attain the RTPV target for 2022 (albeit with a delay of a couple of years) and then go beyond in terms of installations, in a strategic manner.

3. Current position

I. About 1400+ Solar Rooftop Power Plants are installed in different Government building across the state.

II. Government of Jharkhand has selected "Giridih City" to develop as model Solar City of the State. Government of Jharkhand has sanctioned Solar City Scheme accordance to the Concept note issued by MNRE for development of Solar City. To meet the annual electricity demand of Giridih City through solar power generation, it has proposed various Grid Connected interventions such as Ground mounted Solar, Rooftop Solar projects etc.

III. To achieve the objective of Solar City, JREDA has planned few technical interventions for effective implementation of various works under the scheme. Interventions proposed for Gridih under the Solar City scheme are grouped into following categories:

- Grid Connected Rooftop Program for Domestic Sector under MNRE phase-II Programme
- Grid Connected Rooftop Program for Commercial Sectors in RESCO Mode Solar LED Street Lights

IV. Ground Mounted Solar Power Plant Development in RESCO/CAPEX.

Further, based on the initial assessment and available solar radiation data, Solar Irradiance is sufficient to utilize it efficiently for various applications across all the sectors like Residential, Commercial, Institutional, Industrial and Municipal.

As per the preliminary assessment done by JREDA on details of electric connections provided by JBVNL for Giridih Municipal area. Total electrical connections stand at 29858 nos. with a connected load demand of 40925 kW (41 MW Approx.).

4. Objective of EoI:

i. **Survey of Residential/Commercial/Industrial Roof**, which enables the total number of feasible roofs to install the solar PV Plant at Giridih City under the Municipal Corporation Area.

ii. **Accurate potential assessment,** which is to provide Accurate information regarding solar generation potential, optimum system design and economics to each consumer, and feasible buildings.

iii. **Cost Reduction,** dividing the covered city area in zones with similar cumulative RTPV Capacities.

iv. **Distribution infrastructure,** to identify which DTs need to be upgraded to incorporate RTPV in the near future.

5. Expected Benefits

i. Aerial imagery for mapping rooftops.

ii. Solar generation potential estimation for each rooftop with shading analysis.

iii. Optimal system sizing for each rooftop.

iv. DT analysis for RTPV & integration.

v. Criteria analysis for choosing best rooftops.

6. Scope of work:

Scope of Work of Consultant includes the following:

a. **Accurate potential assessment:** Agency will use innovative drone-based Aerial Photogrammetry (AP) to assess the potential of every rooftop in Giridih. This aerial imagery-based approach will provide accurate information regarding solar generation potential, optimum system design and economics to each consumer, and a list of all suitable buildings with geographical coordinates and system sizes to the energy department.

b. **Aggregator model for cost reduction:** Agency will work with JREDA with the objective of dividing the covered city area in zones with similar cumulative RTPV Capacities. This will provide the developers with bulk demand and help reduce costs of RTPV.

c. **Assessing distribution infrastructure:** Agency will work with JREDA / JBVNL to identify which DTs need to be upgraded to incorporate RTPV in the near future.

Based on the above three, agency will prepare a roadmap for RTPV development in the covered city which will significantly help the state reach the target.

I. Aerial Photometry (AP) with UAVs/drones will be used to create high resolution 3D maps of cities with unique discretized rooftops and associated shading analyses.

II. The solar resource data will be obtained from National Renewable Energy Laboratories (NREL) or National Institute of Wind Energy (NIWE) databases. This along with the 3D maps will be overlaid upon the GIS base map of the cities.

III. The consumer tagging exercise conducted by JREDA / JBVNL will serve as inputs in terms of geotagging the consumer to the specific rooftop(s), sanctioned load, 12 months consumption data, consumer category, connected distribution transformer (DT) and spare capacity.

IV. This will enable to automatically design the optimal RTPV system on the shadow free areas of each rooftop after taking the present net/gross-metering policy framework into account.

V. The consumer can log in to the tool using the associated DISCOM Account ID and view the feasibility assessment along with relevant techno-economic parameters such as capital cost (with and without subsidy), payback period and internal rate of return (IRR).

VI. Consumers/developer will be given a software platform where they have the option to draw a polygon on their respective rooftops indicating the area for RTPV installations or choose a higher/lower system size based on available capital. A GIS map of the DTs of the DISCOM will be used to determine whether a consumer can install an RTPV system based on the spare capacity of the connected DT.

d. **Methodology for completing the scope of work.**

- Aerial imagery for mapping rooftops.
- Solar generation potential estimation for each rooftop with shading analysis.
- Optimal system sizing for each rooftop.
- DT analysis for RTPV & integration.

- ❖ Multi-criteria analysis for choosing best rooftops.
- ❖ Strategic roadmap for RTVP by 2021-22.
- ❖ Net/ gross-metering policy framework.
- ❖ Tendering & roll out.

Other Scope:

Agency will also available in the form of a data room for JREDA/ JBVNL and developers. CSTEP will work with JREDA / JBVNL to divide each city based on the DISCOM subdivisions using a GIS platform. Based on the consumer tagging exercise, CREST will then calculate the number of suitable rooftops and store the DPR for each of the selected rooftops under the following size categories:

1. 0-3 kW
2. 3-10 kW
3. 10-50 kW
4. >50 kW

Each DPR will contain the following information:

- Consumer Name, Address, Geotagged Location and Contact Details
- System Size (in kW) and Design (placement of panels on the rooftop)
- Capital Cost and Bill of Materials
- Annual and Daily Expected Generation (in kWh)
- Payback Period and IRR

  A multi-criteria analysis (MCA) ranking process will be used rank the buildings in each size category for every subdivision. This structured data room can be used in the near future for large-scale tenders by the Energy Department or JREDA / JBVNL.

7. Payment to Agency

The project will be at no cost to Government of Jharkhand/JREDA. Agency will bear the cost of the project and only technical/administrative support will be provided by JREDA.

8. Presentation from Parties responding to EOI

Parties responding to this EOI should submit their responses. Parties should submit presentation to the management of JREDA. The presentation from the bidder should cover the following aspects –

- Experience in implementation of the parameters and format for RTPV Survey as required in Annexure-I.
- Proposed methodology for implementation of RTPV Survey for Cost reduction.

- Best practices in implementation of Installation & Construction technologies suited for rooftop solar power plants.

Director, JHARKHAND RENEWABLE ENERGY DEVELOPMENT AGENCY
3rd Floor, SLDC Building, Kusai, Doranda, Ranchi-834002, Jharkhand
Email: info@jreda.com