



28 February 2018

REQUEST FOR PROPOSAL (RFP-BD-2018-005)

Dear Sir / Madam:

We kindly request you to submit your Proposal for **Hiring a firm for conducting a National Photo Voltaic Resource Assessment Study/Research and Training in Bangladesh for SrepGen Projects of UNDP Bangladesh.**

Please be guided by the form attached hereto as Annex 2, in preparing your Proposal.

Proposals shall be submitted on or before 4.30 p.m. (local time) on Thursday, March 15, 2018

Proposals may be submitted on or before the deadline indicated by UNDP in the **e-Tendering system** submission through online e-Tendering system kindly use the following link:

<https://etendering.partneragencies.org>; using your username and password. If you have not registered in the system before, you can register now by logging in using

Username: event.guest

Password: why2change

and follow the registration steps as specified in the system user guide.

Your Proposal must be expressed in the English, and valid for a minimum period of 90 days

You are kindly requested to indicate whether your company intends to submit a Proposal by clicking on "Accept Invitation".

In the course of preparing and submitting your Proposal, it shall remain your responsibility to ensure that it submitted into the system by the deadline. The system will automatically block and not accept any bid after the deadline. Kindly ensure that supporting documents required are signed and in the .pdf format, and free from any virus or corrupted files.

The Financial Proposal and the Technical Proposal files **MUST BE COMPLETELY SEPARATE** and uploaded/send separately in the e-tendering system or through bd.procurement@undp.org (only financial Proposal if asked) and clearly named as either "TECHNICAL PROPOSAL" or "FINANCIAL PROPOSAL", as appropriate. Each document shall include the Proposer's name and address. **The file with the "FINANCIAL PROPOSAL" must be encrypted with a password so that it cannot be opened nor viewed until the Proposal has been found to pass the technical evaluation stage. Once a Proposal has been found to be responsive by passing the technical evaluation stage, UNDP shall request via email the Proposer to submit the password to open the Financial Proposal.** The Proposer shall assume the responsibility for not encrypting the financial proposal.

A handwritten signature in black ink, located at the bottom right of the page.

PLEASE DO NOT PUT THE PRICE OF YOUR PROPOSAL IN THE 'LINE ITEMS' IN THE SYSTEM. INSTEAD PUT 1 AND UPLOAD THE FINANCIAL PROPOSAL AS INSTRUCTED ABOVE.

The Proposal that complies with all of the requirements, meets all the evaluation criteria and offers the best value for money shall be selected and awarded the contract. Any offer that does not meet the requirements shall be rejected.

Any discrepancy between the unit price and the total price shall be re-computed by UNDP, and the unit price shall prevail and the total price shall be corrected. If the Service Provider does not accept the final price based on UNDP's re-computation and correction of errors, its Proposal will be rejected.

No price variation due to escalation, inflation, fluctuation in exchange rates, or any other market factors shall be accepted by UNDP after it has received the Proposal. At the time of Award of Contract or Purchase Order, UNDP reserves the right to vary (increase or decrease) the quantity of services and/or goods, by up to a maximum twenty five per cent (25%) of the total offer, without any change in the unit price or other terms and conditions.

Any Contract or Purchase Order that will be issued as a result of this RFP shall be subject to the General Terms and Conditions attached hereto. The mere act of submission of a Proposal implies that the Service Provider accepts without question the General Terms and Conditions of UNDP, herein attached as Annex 3.

Please be advised that UNDP is not bound to accept any Proposal, nor award a contract or Purchase Order, nor be responsible for any costs associated with a Service Providers preparation and submission of a Proposal, regardless of the outcome or the manner of conducting the selection process.

UNDP's vendor protest procedure is intended to afford an opportunity to appeal for persons or firms not awarded a Purchase Order or Contract in a competitive procurement process. In the event that you believe you have not been fairly treated, you can find detailed information about vendor protest procedures in the following link:

<http://www.undp.org/content/undp/en/home/operations/procurement/protestandsanctions/>

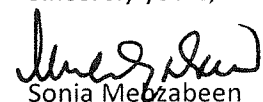
UNDP encourages every prospective Service Provider to prevent and avoid conflicts of interest, by disclosing to UNDP if you, or any of your affiliates or personnel, were involved in the preparation of the requirements, design, cost estimates, and other information used in this RFP.

UNDP implements a zero tolerance on fraud and other proscribed practices, and is committed to preventing, identifying and addressing all such acts and practices against UNDP, as well as third parties involved in UNDP activities. UNDP expects its Service Providers to adhere to the UN Supplier Code of Conduct found in this link : http://www.un.org/depts/ptd/pdf/conduct_english.pdf

Thank you and we look forward to receiving your Proposal.



Sincerely yours,



Sonia Mezbabeen

Operations Manager

February 28, 2018

Description of Requirements

Context of the Requirement	<p>Power Division, Ministry of Power Energy and Mineral Resources, GoB is implementing GEF-Funded Project “Development of Sustainable Renewable Energy Power generation (SREPGen)”. The objective of the Project is to reduce the annual growth rate of GHG emissions from the fossil fuel-based power generation by exploiting Bangladesh’s renewable energy resources for electricity generation. The basic approach of the Project will be to promote renewable energy in Bangladesh through the recently established Sustainable and Renewable Energy Development Authority (SREDA). For Bangladesh to achieve a greater share of renewable energy (RE) in its energy mix, the project has four main components that will: (i) transform SREDA to evolve into a facilitation centre to support private sector RE investment development; enable regulators to determine fair flexible tariff structures, develop RE power plans, and adopt RE power management and incentive regulations; bring confidence to private RE investors; and increase the number of approved RE projects;(ii) increase capacities of relevant government agencies to generate, process, obtain and disseminate reliable RE resource information for use by GoB and potential project developers and investors;(iii) increase affordability and access to photovoltaic solar power and associated livelihood benefits for low income households;(iv) account increased shares of renewable energy into Bangladesh’s power generation mix; The objective of the assignment is to conduct PV resource assessment through installing 10 Nos. solar irradiance monitoring station across Bangladesh. The objective of the assignment is to conduct PV resource assessment through installing 10 Nos. solar irradiance monitoring station across Bangladesh. A high quality solar irradiance study has to be conducted which will inform the spatial and temporal pattern of solar irradiance in Bangladesh. In the process, SREDA officials will be trained also to handle the equipment to be installed under this assignment and other technical aspects. This assignment is combined with research and study where data will be fed by the 10 Nos. solar irradiance monitoring station across Bangladesh. Those monitoring station has to be supplied and installed under this firm contract along with its maintenance advisory support for next one year after the study.</p>
Implementing Partner of UNDP	GEF-Funded Project “Development of Sustainable Renewable Energy Power generation (SREPGen)
Brief Description of the Required Services ¹	The assignment will require an estimated 15 months of consulting services starting from March 2018 to June 2019. The tasks to be performed by the firm will include, but are not limited to as below:

¹ A detailed TOR may be attached if the information listed in this Annex is not sufficient to fully describe the nature of the work and other details of the requirements.



The Consulting Firm (alone or in association with JV) will provide high-level technical support to SREDA in preparing a nation-wide solar map on which investors can rely for preparing their investment document and GoB can use it for negotiating tariff proposal of PV power generation companies. Scope of work includes following activities but not limited to:

(i) Equipment, Installation and data transmission

For this study at least 10 Pyranometer systems have to be implemented at different locations in Bangladesh. For accessing the data, necessary access to monitor the solar irradiance data has to be provided to SREDA and SREPGen through web server using smart sensors developed by the firm. A mobile apps need to be developed as well for accessing the solar irradiance data from the stations. *Technical specification of solar irradiance monitoring stations is presented in annex-1. These systems will be transferred to SREPGen after the study and has to provide one year service in the form of advice regarding technical solution.*

(ii) Monitoring Design

A prefeasibility study has to be conducted for determining of measuring sites for solar irradiance, based on cluster analysis of satellite-derived cloud estimations. Based on the dominance of cloud effect on solar irradiance and the advantage of the high spatial resolution of a geostationary satellite potential location of monitoring station has to be selected. Technical brief needs to be submitted in the technical proposal.

(iii) High Quality Report

A high-quality report of solar irradiance aspects on Bangladesh has to be developed. The aim of this study is to design and implement an integrated system for the real-time monitoring of the available solar potential in Bangladesh with measurements from the proposed solar irradiance monitoring stations, estimation from satellite images and data. This study combines for the first time in Bangladesh measurements of solar energy from an organized network of stations, with satellite images of cloudiness, satellite data of atmospheric suspensions and model calculations, leading to the production of maps and graphs of the capture of solar energy over Bangladesh in detail temporal and spatial scale. The ultimate goal is that the products of the project are useful tools for designing and estimating the energy productivity of solar power units and devices.

(iv) System and Knowledge Transfer

A comprehensive training and capacity building program has to be envisaged in this assignment. The next component is the transfer of technology and knowledge sharing issues for solar irradiance study.

The final outputs/deliverables produced under this consultancy, to be developed in collaboration with the UNDP and GoB team, are the following:

1. *Inception report with methodology and detail work plan*
2. *Pre-feasibility report for potential monitoring sites of solar irradiance stations*

	<ol style="list-style-type: none"> 3. <i>Installation of 10 (Solar Irradiance monitoring) systems and web link</i> 4. <i>Detail cook book for the maintenance and other technical related information</i> 5. <i>Two Training and Capacity development sessions with report</i> 6. <i>Draft report on Solar Irradiance Study and Presentation and Solar Irradiance Apps</i> 7. <i>Final report on Solar Irradiance Study on Bangladesh with digital GIS based solar map, finalized Apps, handover of installed 10 monitoring systems and Presentation Material</i> <p>The consulting firm will present appropriate work modality/approach, detail ToR. Technical and financial proposal for performing the above assignment. Other interim outputs may be produced to facilitate the completion of the assignment, at the discretion of the Consulting Firm (memos, note to file, mission reports, back-to-office report, etc.). The firm will ensure comprehensive, coherent, high quality reporting, in clear and professional format. In case of doubt, UNDP focal points will determine the format of reporting.</p> <p>Preparatory activities: The selected firm will thoroughly study the Terms of Reference (ToR) and discuss with the UNDP and GoB counterpart. In consultation with UNDP representative and the GOB focal, the entity will prepare an elaborate work plan detailing the composition of a Team with detail ToR. UNDP will organize an orientation/meeting for the entity to present in detail and ensure a shared understanding. The orientation will cover among others the background to the assignment, objectives and rationale, discussion of the indicators, baseline and procedures, reporting formats and obligations as well as team organization/coordination and logistical arrangements for various missions.</p> <p>Supervision and Reporting: The Firm will work under the direct supervision of SREPGen Project of UNDP Bangladesh team and in collaboration with the GoB focal (SREDA). UNDP Bangladesh will ensure access to key government counterparts (including access to data and info) and assist the entity/firm with identifying key implementing agencies. All of the communication to UNDP will be reported to Project Manager, SREPGen an Programme Specialist (Environmental Sustainability and Energy), Resilience and Inclusive growth cluster of UNDP Bangladesh.</p>				
List and Description of Expected Outputs to be Delivered	<table border="1"> <thead> <tr> <th data-bbox="509 1688 1170 1759">Key Tasks</th><th data-bbox="1170 1688 1411 1759">Timeline (estimated)</th></tr> </thead> <tbody> <tr> <td data-bbox="509 1759 1170 1854">1. Inception report with methodology and detail work plan</td><td data-bbox="1170 1759 1411 1854">30 March 2018</td></tr> </tbody> </table>	Key Tasks	Timeline (estimated)	1. Inception report with methodology and detail work plan	30 March 2018
Key Tasks	Timeline (estimated)				
1. Inception report with methodology and detail work plan	30 March 2018				



	2. Pre-feasibility report for potential monitoring sites of solar irradiance stations	1 April, 2018
	3. Installation of 10 (Solar Irradiance monitoring) systems and web link	1 June, 2018
	4. Detail cook book for the maintenance and other technical related information	1 October, 2018
	5. Two Training and Capacity development sessions with report	Two weeks (from Aug to December 2018)
	6. Draft report on Solar Irradiance Study and Presentation and Solar Irradiance Apps	15 April, 2018
	7. Complete report on Solar Irradiance Study on Bangladesh with digital GIS based solar map, finalized Apps, handover of installed 10 monitoring systems and Presentation Material	01 July, 2019
Person to Supervise the Work/Performance of the Service Provider	<p>The Firm/Agency/Organization will be contracted by UNDP Bangladesh (on behalf of the Government of Bangladesh) under UNDP's standard rules, condition and regulations. The contracted firm will report to Project Manager, SREPGen in close coordination with Programme Specialist (Environmental Sustainability and Energy) of Resilience and Inclusive growth cluster of UNDP Bangladesh. Project Manager will provide oversight and quality assurance who will also carry out a performance evaluation after successful completion of the assignment.</p> <p>Any Firm/Agency/Organization/University/Institute/Think Tank/NGO that has relevant professional experiences of conducting such irradiance Study and associated assignment will be eligible for this assignment. A firm or institute or university will be awarded the contract based on their competency prior to quality of technical proposal and the financial proposal. The reputation, track record and capacity of carrying out such assignment would also be considered in selection process.</p> <p>The composition of the team will depend on the firm/ institutes' best judgment to accomplish the assessment maintaining the high quality and with commitment of timely delivery. The arrangement could be a Team Leader (Principal Consultant) and a team of specialist (e.g. Irradiation Study Expert, Solar Energy Specialist, GIS Specialist, etc.) and research associates and operational assistants (for data and information collation and collection, data analysis, formatting of reports, logistic arrangement, etc.) for conducting nation-wide solar irradiance study in Bangladesh. Ten irradiance monitoring stations will be installed under this consultancy also. Detail CV of all proposed human resources and specification of monitoring stations need to be provided in the proposal with expected deliverables.</p>	

Frequency of Reporting	<i>As Indicate in the TOR</i>
Progress Reporting Requirements	<i>As Indicate in the TOR</i>
Location of work	<input type="checkbox"/> Exact Address/es <i>[pls. specify]</i> <input type="checkbox"/> At Contractor's Location <input checked="" type="checkbox"/> As Indicate in the TOR
Expected duration of work	<p>The duration of the assignment will be for 15 months of consulting services starting from March 2018 to June 2019. The Firm/Agency/Institution will incorporate costs of field visits and domestic travel (if required) in their proposal. The assignment will be done mostly in desk review, field visits, monitoring stations installment, data collection via web from the stations, data analysis, stakeholder consultation etc. For collection of information, installation of monitoring stations and to conduct detail studies, visit to remote islands may be required.</p> <p>The consultants will be based at the PMU Office of SREPGen Project at SREDA, when in Dhaka with some mission to the field. (Approximately 30 days). For rest of the time, they will use their own location (home based) and premise.</p>
Target start date	25 March 2018
Latest completion date	Mid of June 2019
Travels Expected	<input checked="" type="checkbox"/> <i>As indicated in the ToR</i>
Special Security Requirements	<input type="checkbox"/> Security Clearance from UN prior to travelling <input type="checkbox"/> Completion of UN's Basic and Advanced Security Training <input type="checkbox"/> Comprehensive Travel Insurance <input checked="" type="checkbox"/> Not applicable <input type="checkbox"/> Others <i>[pls. specify]</i>
Facilities to be Provided by UNDP (i.e., must be excluded from Price Proposal)	<input type="checkbox"/> Office space and facilities <input type="checkbox"/> Land Transportation <input checked="" type="checkbox"/> Others As per TOR
Implementation Schedule indicating breakdown and timing of activities/sub-activities	<input checked="" type="checkbox"/> Required <input type="checkbox"/> Not Required
Names and curriculum vitae of individuals who will be involved in completing the services	<input checked="" type="checkbox"/> Required <input type="checkbox"/> Not Required
Currency of Proposal	<input type="checkbox"/> United States Dollars <input type="checkbox"/> Euro <input checked="" type="checkbox"/> Local Currency BDT or USD for international

Value Added Tax on Price Proposal ²	<input checked="" type="checkbox"/> must be inclusive of VAT and other applicable indirect taxes <input type="checkbox"/> must be exclusive of VAT and other applicable indirect taxes
Validity Period of Proposals (<i>Counting for the last day of submission of quotes</i>)	<input type="checkbox"/> 60 days <input checked="" type="checkbox"/> 90 days <input type="checkbox"/> 120 days In exceptional circumstances, UNDP may request the Proposer to extend the validity of the Proposal beyond what has been initially indicated in this RFP. The Proposal shall then confirm the extension in writing, without any modification whatsoever on the Proposal.
Partial Quotes	<input checked="" type="checkbox"/> Not permitted <input type="checkbox"/> Permitted <i>[pls. provide conditions for partial quotes, and ensure that requirements are properly listed to allow partial quotes (e.g., in lots, etc.)]</i>
Payment Terms ³	<ul style="list-style-type: none"> • 1st Instalment: 15% of the total contract shall be paid upon submission of Inception report with methodology and details work plan and accepted by the UNDP contract administrator; • 2nd Instalment: 15% of the total contract shall be paid upon submission of pre-feasibility report for potential monitoring sites of solar irradiance stations and accepted by the UNDP contract administrator; • 3rd Instalment: 30% of the total contract shall be paid upon installation of 10 (Solar Irradiance monitoring) systems and web link, detail cook book for the maintenance and other technical related information, two Training and Capacity development sessions with report and accepted by the UNDP contract administrator; • Final Instalment: 40% of the total contract shall be paid upon submission of complete report on Solar Irradiance Study on Bangladesh with digital GIS based solar map, finalized Apps, handover of installed 10 monitoring systems and Presentation Material and accepted by the UNDP contract administrator;
Person(s) to review/inspect/ approve outputs/completed services and authorize the disbursement of payment	National Project Manager, SrepGen Project, Programme Specialist, Environmental Sustainability and Energy

² VAT exemption status varies from one country to another. Pls. check whatever is applicable to the UNDP CO/BU requiring the service.

³ UNDP preference is not to pay any amount in advance upon signing of contract. If the Service Provider strictly requires payment in advance, it will be limited only up to 20% of the total price quoted. For any higher percentage, or any amount advanced exceeding \$30,000, UNDP shall require the Service Provider to submit a bank guarantee or bank cheque payable to UNDP, in the same amount as the payment advanced by UNDP to the Service Provider.



Type of Contract to be Signed	<input type="checkbox"/> Purchase Order <input type="checkbox"/> Institutional Contract <input checked="" type="checkbox"/> Contract for Professional Services <input type="checkbox"/> Long-Term Agreement ⁴ (if LTA will be signed, specify the document that will trigger the call-off. E.g., PO, etc.) <input type="checkbox"/> Other Type of Contract [pls. specify]
Criteria for Contract Award	<input type="checkbox"/> Lowest Price Quote among technically responsive offers <input checked="" type="checkbox"/> Highest Combined Score (based on the 70% technical offer and 30% price weight distribution) <input checked="" type="checkbox"/> Full acceptance of the UNDP Contract General Terms and Conditions (GTC). This is a mandatory criterion and cannot be deleted regardless of the nature of services required. Non- acceptance of the GTC may be grounds for the rejection of the Proposal.
Criteria for the Assessment of Proposal	<p>Evaluation and comparison of proposals: Prior to the technical evaluation all proposals will be screened based on the minimum eligibility criteria mentioned below:</p> <p>Eligibility criteria of the consulting firm:</p> <ul style="list-style-type: none"> • Updated Business Trade Licenses – Registration Papers, Tax Payment Certification, VAT Certificate, etc. including Articles of Incorporation, or equivalent document if Bidder is not a corporation. • Company Profile, which should not exceed fifteen (15) pages including any printed brochure relevant to the services being procured. • The firm must submit latest audit report such as (2016-2017, 2015-2016 fiscal years) • Minimum 10 years of working experience of assessment in the field of climate change, disaster risk management, renewable energy, Irradiance study, etc. and at least 5 years of experience in conducting irradiance study; • Minimum 5 years of experience of designing and installing irradiance study/ monitoring sensors and its appropriate application; • Minimum 5 engagements in international/national technical assistance projects focused on renewable energy, climate change, disaster risks management, etc. • Written Self-Declaration that the company is not in the UN Security Council 1267/1989 List, UN Procurement Division List or Other UN Ineligibility List.

⁴ Minimum of one (1) year period and may be extended up to a maximum of three (3) years subject to satisfactory performance evaluation. This RFP may be used for LTAs if the annual purchases will not exceed \$100,000.00.



Minimum eligibility criteria of key personnel:

Following three categories of human resources may be required for accomplishing the proposed assignment:

- **Team Leader/Adviser (1);**
- **Specialists/Experts (1);**
- **Data Analyst/Research /Operation Assistants (2)**

a. Minimum eligibility criteria of the Team Leader/Adviser/Lead Consultant:

ACADEMIC QUALIFICATIONS

- M.Sc. in relevant discipline (environmental sciences, electrical, mechanical, renewable energy or technology and resources management degrees)
- Must have an Advance degree (Ph.D in environmental, climate, energy or technology management related field)

EXPERIENCE

- Minimum 10 years of professional experience of which 5 years in related subject
- Must have experience in leading at least five international assignments related to implementation on renewable energy projects -
- Extensive international experience in designing and monitoring of weather and energy related projects. Previous experiences on designing and implementation of solar PV monitoring system is desired;
- Must have experiences of at least three years on leading projects on sensor technology, data integration and assessment and able to demonstrate web based system and data integration platform
- Must have excellent report writing skills and experience in writing and presenting reports to a high professional and policy level (which includes graphs, pictures, diagrams, figures and other illustrative tools to enhance the reporting quality)

b. Minimum eligibility criteria of other Specialist/Expert

I. Academic Qualifications:

Minimum Master's in relevant fields (e.g. Renewable Energy, Environmental science, Engineering, Economist, Development Planning, GIS Expert, Mitigation/Energy Expert, etc.)

II. Years of experience:

1. Minimum 5 years of progressive experience in conducting similar assignment
2. Experience of completing at least 3 assignments in similar field. List of completed research/publication to be enclosed in CV.

Minimum eligibility criteria of other Research Assistant/Operational Support Staff

I. Academic Qualifications:

Minimum Graduate degree in the field of Environment science, Engineering, Economics, development planning, Business Administration

II. Years of experience:

1. At least 2 years of progressive experience in conducting similar assignments (especially in data collection, survey, data analysis and reporting);
2. Experience of completing at least 2 assignments in similar areas.

Note: Necessary documentation must be submitted to substantiate the above eligibility criteria.

Consultancy firms that do not meet the above eligibility criteria shall not be considered for further evaluation.

The firm must provide CVs of all proposed personnel for the assignment, stating name, highest academic qualification, professional certification, length of experience, role/function and other related information.

Technical Proposal (70%)

- ☒ Overall Experience and qualification of firm **20 %**
- ☒ Methodology, Its Appropriateness to the Condition and Timeliness of the Implementation Plan **33%**
- ☒ Management Structure and Qualification of Key Personnel **17%**

Basis of Technical Evaluation

Criteria	Weight	Max. Points
<u>Technical</u>	70	
1. Overall experience and qualifications of the firm/organization		
Experience and qualification of firm/organization		5
Experience with similar assignment in last 10 years		10
Volume of Similar job completion task or assignment		5
2. Methodology proposed in the technical proposal		
Adequacy of proposed work plan and coverage of thematic areas relevant to the assignment as per the Terms of Reference		10



	Demonstrated understanding of the assignment particularly on ToR of Team Leader and other specialists/expert		3
	Appropriateness and relevance of approach and methodology		10
	Matching with the specification of the monitoring stations (Sensors/loggers etc.) to be compared with the given specification (e.g. 90% matching-full points)		10
	3. Skills and experience of experts nominated		
	Suitability of team composition for the assignment (number and type of experts)		2
	Qualification, experience and skills of the Team Leader/Lead Consultant		10
	Qualification, experience and skills of the Specialist/Expert/ Research/ Assistant		5
	Financial	30	
	Total	100	

Financial Proposal (30%)

In the Second Stage, the price proposal of all contractors, who have attained minimum 70% score in the technical evaluation, will be compared. The contract will be awarded to the bidder offering the 'best value for money'. The contract will be awarded to the Contractor based on the cumulative method. The formula for the rating of the Proposals will be as follows:

Rating the Technical Proposal (TP):

TP Rating = (Total Score Obtained by the Offer / Max. Obtainable Score for TP) x 100

Rating the Financial Proposal (FP):

FP Rating = (Lowest Priced Offer / Price of the Offer Being Reviewed) x 100

Total Combined Score:

(TP Rating) x (Weight of TP, e.g. 70%) + (FP Rating) x (Weight of FP, e.g., 30%)

=Total Combined and Final Rating of the Proposal

The proposal obtaining the overall highest score after adding the score of the technical proposal and the financial proposal is the proposal that offers best value for money

UNDP will award the contract to:

☒ One and only one Service Provider

☐ One or more Service Providers, depending on the following factors :

[Clarify fully how and why will this be achieved. Please do not choose this option without indicating the parameters for awarding to multiple Service Providers]

Annexes to this RFP ⁵	<input checked="" type="checkbox"/> Form for Submission of Proposal (Annex 2) <input checked="" type="checkbox"/> General Terms and Conditions / Special Conditions (Annex 3) ⁶ <input checked="" type="checkbox"/> Detailed TOR <i>[optional if this form has been accomplished comprehensively]</i> <input checked="" type="checkbox"/> Others ⁷ Annexure-1 (As attached with TOR)
Contact Person for Inquiries (Written inquiries only) ⁸	bd.procurement@undp.org <i>Please mention the following in the subject while sending any query to UNDP regarding this RFP on or before 11 March 2018.</i> <i><u>"Queries on RFP-BD-2018-005"</u></i> Any delay in UNDP's response shall be not used as a reason for extending the deadline for submission, unless UNDP determines that such an extension is necessary and communicates a new deadline to the Proposers.
Other Information <i>[p/s. specify]</i>	A pre-bid meeting will be held at IDB Bhaban, (19 th floor), meeting room, for the clarification on the bidding document and ToR Time: 12.30 PM (local Time); Date: 3/7/2018 Venue: Village Well, UNDP Bangladesh, 19 Floor, IDB Building, E/8, Begum Rokeya Sharani, Sher-e-Bangla Nagor, Agargaon, Dhaka-1207, Bangladesh. Note: Bidder needs to carry a valid Passport/NID/Credit or Debit card with photo/Original driving license in order to enter into IDB Bhaban for the pre-bid meeting. The Financial Proposal and the Technical Proposal files <u>MUST BE SEPARATE</u> and uploaded <u>SEPARATELY</u> .

⁵ Where the information is available in the web, a URL for the information may simply be provided.

⁶ Service Providers are alerted that non-acceptance of the terms of the General Terms and Conditions (GTC) may be grounds for disqualification from this procurement process.

⁷ A more detailed Terms of Reference in addition to the contents of this RFP may be attached hereto.

⁸ This contact person and address is officially designated by UNDP. If inquiries are sent to other person/s or address/es, even if they are UNDP staff, UNDP shall have no obligation to respond nor can UNDP confirm that the query was received.

FORM FOR SUBMITTING SERVICE PROVIDER'S PROPOSAL⁹

(This Form must be submitted only using the Service Provider's Official Letterhead/Stationery¹⁰)

[insert: Location]

[insert: Date]

To: [insert: Name and Address of UNDP focal point]

Dear Sir/Madam:

We, the undersigned, hereby offer to render the following services to UNDP in conformity with the requirements defined in the RFP dated [specify date], and all of its attachments, as well as the provisions of the UNDP General Contract Terms and Conditions:

A. Qualifications of the Service Provider

The Service Provider must describe and explain how and why they are the best entity that can deliver the requirements of UNDP by indicating the following:

Eligibility criteria of the consulting firm:

- Updated Business Trade Licenses – Registration Papers, Tax Payment Certification, VAT Certificate, etc. including Articles of Incorporation, or equivalent document if Bidder is not a corporation.
- Company Profile, which should not exceed fifteen (15) pages including any printed brochure relevant to the services being procured.
- The firm must submit latest audit report such as (2016-2017, 2015-2016 fiscal years)
- Minimum 10 years of working experience of assessment in the field of climate change, disaster risk management, renewable energy, Irradiance study, etc. and at least 5 years of experience in conducting irradiance study;
- Minimum 5 years of experience of designing and installing irradiance study/ monitoring sensors and its appropriate application;
- Minimum 5 engagements in international/national technical assistance projects focused on

⁹ This serves as a guide to the Service Provider in preparing the Proposal.

¹⁰ Official Letterhead/Stationery must indicate contact details – addresses, email, phone and fax numbers – for verification purposes

renewable energy, climate change, disaster risks management, etc.

- *Written Self-Declaration that the company is not in the UN Security Council 1267/1989 List, UN Procurement Division List or Other UN Ineligibility List.*

B. Proposed Methodology for the Completion of Services

The Service Provider must describe how it will address/deliver the demands of the RFP; providing a detailed description of the essential performance characteristics, reporting conditions and quality assurance mechanisms that will be put in place, while demonstrating that the proposed methodology will be appropriate to the local conditions and context of the work.

C. Qualifications of Key Personnel

If required by the RFP, the Service Provider must provide:

Following three categories of human resources may be required for accomplishing the proposed assignment:

- *Team Leader/Adviser (1);*
- *Specialists/Experts (1);*
- *Data Analyst/Research /Operation Assistants (2)*

a. Minimum eligibility criteria of the Team Leader/Adviser/Lead Consultant:

ACADEMIC QUALIFICATIONS

- *M.Sc. in relevant discipline (environmental sciences, electrical, mechanical, renewable energy or technology and resources management degrees) ;*
- *Must have an Advance degree (Ph.D in environmental, climate, energy or technology management related field)*

EXPERIENCE

- *Minimum 10 years of professional experience of which 5 years in related subject*
- *Must have experience in leading at least five international assignments related to implementation on renewable energy projects -*
- *Extensive international experience in designing and monitoring of weather and energy related projects. Previous experiences on designing and implementation of solar PV monitoring system is desired;*
- *Must have experiences of at least three years on leading projects on sensor technology, data integration and assessment and able to demonstrate web based system and data integration platform*
- *Must have excellent report writing skills and experience in writing and presenting reports to a high professional and policy level (which includes graphs, pictures, diagrams, figures and other illustrative tools to enhance the reporting quality)*

b. Minimum eligibility criteria of other Specialist/Expert



I. Academic Qualifications:

Minimum Master's in relevant fields (e.g. Renewable Energy, Environmental science, Engineering, Economist, Development Planning, GIS Expert, Mitigation/Energy Expert, etc.)

II. Years of experience:

1. Minimum 5 years of progressive experience in conducting similar assignment
2. Experience of completing at least 3 assignments in similar field. List of completed research/publication to be enclosed in CV.

Minimum eligibility criteria of other Research Assistant/Operational Support Staff

I. Academic Qualifications:

Minimum Graduate degree in the field of Environment science, Engineering, Economics, development planning, Business Administration

II. Years of experience:

1. At least 2 years of progressive experience in conducting similar assignments (especially in data collection, survey, data analysis and reporting);
2. Experience of completing at least 2 assignments in similar areas.

Competencies required for all proposed human resources:

1. Must have computer literacy especially on MS Office applications;
2. Must have excellent writing, editing, and oral communication skills in English and Bangla;
3. Must have track record in good financial management and reporting mechanism.

D. Cost Breakdown per Deliverable* (Cost is inclusive all direct and indirect, VAT)

	Deliverables <i>[list them as referred to in the RFP]</i>	Percentage of Total Price <i>(Weight for payment)</i>	Price <i>(Lump Sum, All Inclusive)</i>
1	Deliverable 1		
2	Deliverable 2		
3		
	Total	100%	

**This shall be the basis of the payment tranches*

E. Cost Breakdown by Cost Component [This is only an Example]: (Cost is inclusive all direct and indirect, VAT)

Description of Activity	Remuneration per Unit of Time	Total Period of Engagement	No. of Personnel	Total Rate
I. Personnel Services				
1. Services from Home Office				
a. Expertise 1				
b. Expertise 2				
2. Services from Field Offices				
a. Expertise 1				



b. Expertise 2				
3. Services from Overseas				
a. Expertise 1				
b. Expertise 2				
II. Out of Pocket Expenses				
1. Travel Costs				
2. Daily Allowance				
3. Communications				
4. Reproduction				
5. Equipment Lease				
6. Others				
III. Other Related Costs				

[Name and Signature of the Service Provider's Authorized Person]

[Designation]

[Date]



General Terms and Conditions for Services

1.0 LEGAL STATUS:

The Contractor shall be considered as having the legal status of an independent contractor vis-à-vis the United Nations Development Programme (UNDP). The Contractor's personnel and sub-contractors shall not be considered in any respect as being the employees or agents of UNDP or the United Nations.

2.0 SOURCE OF INSTRUCTIONS:

The Contractor shall neither seek nor accept instructions from any authority external to UNDP in connection with the performance of its services under this Contract. The Contractor shall refrain from any action that may adversely affect UNDP or the United Nations and shall fulfill its commitments with the fullest regard to the interests of UNDP.

3.0 CONTRACTOR'S RESPONSIBILITY FOR EMPLOYEES:

The Contractor shall be responsible for the professional and technical competence of its employees and will select, for work under this Contract, reliable individuals who will perform effectively in the implementation of this Contract, respect the local customs, and conform to a high standard of moral and ethical conduct.

4.0 ASSIGNMENT:

The Contractor shall not assign, transfer, pledge or make other disposition of this Contract or any part thereof, or any of the Contractor's rights, claims or obligations under this Contract except with the prior written consent of UNDP.

5.0 SUB-CONTRACTING:

In the event the Contractor requires the services of sub-contractors, the Contractor shall obtain the prior written approval and clearance of UNDP for all sub-contractors. The approval of UNDP of a sub-contractor shall not relieve the Contractor of any of its obligations under this Contract. The terms of any sub-contract shall be subject to and conform to the provisions of this Contract.

6.0 OFFICIALS NOT TO BENEFIT:

The Contractor warrants that no official of UNDP or the United Nations has received or will be offered by the Contractor any direct or indirect benefit arising from this Contract or the award thereof. The Contractor agrees that breach of this provision is a breach of an essential term of this Contract.

7.0 INDEMNIFICATION:

The Contractor shall indemnify, hold and save harmless, and defend, at its own expense, UNDP, its officials, agents, servants and employees from and against all suits, claims, demands, and liability of any nature or kind, including their costs and expenses, arising out of acts or omissions of the Contractor, or the Contractor's employees, officers, agents or sub-contractors, in the performance of this Contract. This provision shall extend, inter alia, to claims and liability in the nature of workmen's compensation, products liability and liability arising out of the use of patented inventions or devices, copyrighted material or other intellectual property by the



Contractor, its employees, officers, agents, servants or sub-contractors. The obligations under this Article do not lapse upon termination of this Contract.

8.0 INSURANCE AND LIABILITIES TO THIRD PARTIES:

- 8.1** The Contractor shall provide and thereafter maintain insurance against all risks in respect of its property and any equipment used for the execution of this Contract.
- 8.2** The Contractor shall provide and thereafter maintain all appropriate workmen's compensation insurance, or the equivalent, with respect to its employees to cover claims for personal injury or death in connection with this Contract.
- 8.3** The Contractor shall also provide and thereafter maintain liability insurance in an adequate amount to cover third party claims for death or bodily injury, or loss of or damage to property, arising from or in connection with the provision of services under this Contract or the operation of any vehicles, boats, airplanes or other equipment owned or leased by the Contractor or its agents, servants, employees or sub-contractors performing work or services in connection with this Contract.
- 8.4** Except for the workmen's compensation insurance, the insurance policies under this Article shall:
 - 8.4.1** Name UNDP as additional insured;
 - 8.4.2** Include a waiver of subrogation of the Contractor's rights to the insurance carrier against the UNDP;
 - 8.4.3** Provide that the UNDP shall receive thirty (30) days written notice from the insurers prior to any cancellation or change of coverage.
- 8.5** The Contractor shall, upon request, provide the UNDP with satisfactory evidence of the insurance required under this Article.

9.0 ENCUMBRANCES/LIENS:

The Contractor shall not cause or permit any lien, attachment or other encumbrance by any person to be placed on file or to remain on file in any public office or on file with the UNDP against any monies due or to become due for any work done or materials furnished under this Contract, or by reason of any other claim or demand against the Contractor.

10.0 TITLE TO EQUIPMENT:

Title to any equipment and supplies that may be furnished by UNDP shall rest with UNDP and any such equipment shall be returned to UNDP at the conclusion of this Contract or when no longer needed by the Contractor. Such equipment, when returned to UNDP, shall be in the same condition as when delivered to the Contractor, subject to normal wear and tear. The Contractor shall be liable to compensate UNDP for equipment determined to be damaged or degraded beyond normal wear and tear.

11.0 COPYRIGHT, PATENTS AND OTHER PROPRIETARY RIGHTS:

- 11.1** Except as is otherwise expressly provided in writing in the Contract, the UNDP shall be entitled to all intellectual property and other proprietary rights including, but not limited to, patents, copyrights, and trademarks, with regard to products, processes, inventions, ideas, know-how, or documents and other materials which the Contractor has developed for the UNDP under the Contract and which bear a direct relation to or are produced or prepared or collected in consequence of, or during the course of, the performance of the Contract, and the Contractor acknowledges and agrees that such products, documents and other materials constitute works made for hire for the UNDP.



- 11.2** To the extent that any such intellectual property or other proprietary rights consist of any intellectual property or other proprietary rights of the Contractor: (i) that pre-existed the performance by the Contractor of its obligations under the Contract, or (ii) that the Contractor may develop or acquire, or may have developed or acquired, independently of the performance of its obligations under the Contract, the UNDP does not and shall not claim any ownership interest thereto, and the Contractor grants to the UNDP a perpetual license to use such intellectual property or other proprietary right solely for the purposes of and in accordance with the requirements of the Contract.
- 11.3** At the request of the UNDP; the Contractor shall take all necessary steps, execute all necessary documents and generally assist in securing such proprietary rights and transferring or licensing them to the UNDP in compliance with the requirements of the applicable law and of the Contract.
- 11.4** Subject to the foregoing provisions, all maps, drawings, photographs, mosaics, plans, reports, estimates, recommendations, documents, and all other data compiled by or received by the Contractor under the Contract shall be the property of the UNDP, shall be made available for use or inspection by the UNDP at reasonable times and in reasonable places, shall be treated as confidential, and shall be delivered only to UNDP authorized officials on completion of work under the Contract.

12.0 USE OF NAME, EMBLEM OR OFFICIAL SEAL OF UNDP OR THE UNITED NATIONS:

The Contractor shall not advertise or otherwise make public the fact that it is a Contractor with UNDP, nor shall the Contractor, in any manner whatsoever use the name, emblem or official seal of UNDP or THE United Nations, or any abbreviation of the name of UNDP or United Nations in connection with its business or otherwise.

13.0 CONFIDENTIAL NATURE OF DOCUMENTS AND INFORMATION:

Information and data that is considered proprietary by either Party and that is delivered or disclosed by one Party ("Discloser") to the other Party ("Recipient") during the course of performance of the Contract, and that is designated as confidential ("Information"), shall be held in confidence by that Party and shall be handled as follows:

13.1 The recipient ("Recipient") of such information shall:

- 13.1.1** use the same care and discretion to avoid disclosure, publication or dissemination of the Discloser's Information as it uses with its own similar information that it does not wish to disclose, publish or disseminate; and,
- 13.1.2** use the Discloser's Information solely for the purpose for which it was disclosed.

13.2 Provided that the Recipient has a written agreement with the following persons or entities requiring them to treat the Information confidential in accordance with the Contract and this Article 13, the Recipient may disclose Information to:

- 13.2.1** any other party with the Discloser's prior written consent; and,
- 13.2.2** the Recipient's employees, officials, representatives and agents who have a need to know such Information for purposes of performing obligations under the Contract, and employees officials, representatives and agents of any legal entity that it controls controls it, or with which it is under common control, who have a need to know such Information for purposes of performing obligations under the Contract, provided that, for these purposes a controlled legal entity means:
- 13.2.2.1** a corporate entity in which the Party owns or otherwise controls, whether directly or indirectly, over fifty percent (50%) of voting shares thereof; or,
- 13.2.2.2** any entity over which the Party exercises effective managerial control; or,



13.2.2.3 for the UNDP, an affiliated Fund such as UNCDF, UNIFEM and UNV.

- 13.3** The Contractor may disclose Information to the extent required by law, provided that, subject to and without any waiver of the privileges and immunities of the United Nations, the Contractor will give the UNDP sufficient prior notice of a request for the disclosure of Information in order to allow the UNDP to have a reasonable opportunity to take protective measures or such other action as may be appropriate before any such disclosure is made.
- 13.4** The UNDP may disclose Information to the extent as required pursuant to the Charter of the UN, resolutions or regulations of the General Assembly, or rules promulgated by the Secretary-General.
- 13.5** The Recipient shall not be precluded from disclosing Information that is obtained by the Recipient from a third party without restriction, is disclosed by the Discloser to a third party without any obligation of confidentiality, is previously known by the Recipient, or at any time is developed by the Recipient completely independently of any disclosures hereunder.
- 13.6** These obligations and restrictions of confidentiality shall be effective during the term of the Contract, including any extension thereof, and, unless otherwise provided in the Contract, shall remain effective following any termination of the Contract.

14.0 FORCE MAJEURE; OTHER CHANGES IN CONDITIONS

- 14.1** In the event of and as soon as possible after the occurrence of any cause constituting force majeure, the Contractor shall give notice and full particulars in writing to the UNDP, of such occurrence or change if the Contractor is thereby rendered unable, wholly or in part, to perform its obligations and meet its responsibilities under this Contract. The Contractor shall also notify the UNDP of any other changes in conditions or the occurrence of any event that interferes or threatens to interfere with its performance of this Contract. On receipt of the notice required under this Article, the UNDP shall take such action as, in its sole discretion; it considers to be appropriate or necessary in the circumstances, including the granting to the Contractor of a reasonable extension of time in which to perform its obligations under this Contract.
- 14.2** If the Contractor is rendered permanently unable, wholly, or in part, by reason of force majeure to perform its obligations and meet its responsibilities under this Contract, the UNDP shall have the right to suspend or terminate this Contract on the same terms and conditions as are provided for in Article 15, "Termination", except that the period of notice shall be seven (7) days instead of thirty (30) days.
- 14.3** Force majeure as used in this Article means acts of God, war (whether declared or not), invasion, revolution, insurrection, or other acts of a similar nature or force.
- 14.4** The Contractor acknowledges and agrees that, with respect to any obligations under the Contract that the Contractor must perform in or for any areas in which the UNDP is engaged in, preparing to engage in, or disengaging from any peacekeeping, humanitarian or similar operations, any delays or failure to perform such obligations arising from or relating to harsh conditions within such areas or to any incidents of civil unrest occurring in such areas shall not, in and of itself, constitute force majeure under the Contract..

15.0 TERMINATION

- 15.1** Either party may terminate this Contract for cause, in whole or in part, upon thirty (30) days notice, in writing, to the other party. The initiation of arbitral proceedings in accordance with Article 16.2 ("Arbitration"), below, shall not be deemed a termination of this Contract.



- 15.2** UNDP reserves the right to terminate without cause this Contract at any time upon 15 days prior written notice to the Contractor, in which case UNDP shall reimburse the Contractor for all reasonable costs incurred by the Contractor prior to receipt of the notice of termination.
- 15.3** In the event of any termination by UNDP under this Article, no payment shall be due from UNDP to the Contractor except for work and services satisfactorily performed in conformity with the express terms of this Contract.
- 15.4** Should the Contractor be adjudged bankrupt, or be liquidated or become insolvent, or should the Contractor make an assignment for the benefit of its creditors, or should a Receiver be appointed on account of the insolvency of the Contractor, the UNDP may, without prejudice to any other right or remedy it may have under the terms of these conditions, terminate this Contract forthwith. The Contractor shall immediately inform the UNDP of the occurrence of any of the above events.

16.0 SETTLEMENT OF DISPUTES

- 16.1 Amicable Settlement:** The Parties shall use their best efforts to settle amicably any dispute, controversy or claim arising out of this Contract or the breach, termination or invalidity thereof. Where the parties wish to seek such an amicable settlement through conciliation, the conciliation shall take place in accordance with the UNCITRAL Conciliation Rules then obtaining, or according to such other procedure as may be agreed between the parties.
- 16.2 Arbitration:** Any dispute, controversy, or claim between the Parties arising out of the Contract or the breach, termination, or invalidity thereof, unless settled amicably under Article 16.1, above, within sixty (60) days after receipt by one Party of the other Party's written request for such amicable settlement, shall be referred by either Party to arbitration in accordance with the UNCITRAL Arbitration Rules then obtaining. The decisions of the arbitral tribunal shall be based on general principles of international commercial law. For all evidentiary questions, the arbitral tribunal shall be guided by the Supplementary Rules Governing the Presentation and Reception of Evidence in International Commercial Arbitration of the International Bar Association, 28 May 1983 edition. The arbitral tribunal shall be empowered to order the return or destruction of goods or any property, whether tangible or intangible, or of any confidential information provided under the Contract, order the termination of the Contract, or order that any other protective measures be taken with respect to the goods, services or any other property, whether tangible or intangible, or of any confidential information provided under the Contract, as appropriate, all in accordance with the authority of the arbitral tribunal pursuant to Article 26 ("Interim Measures of Protection") and Article 32 ("Form and Effect of the Award") of the UNCITRAL Arbitration Rules. The arbitral tribunal shall have no authority to award punitive damages. In addition, unless otherwise expressly provided in the Contract, the arbitral tribunal shall have no authority to award interest in excess of the London Inter-Bank Offered Rate ("LIBOR") then prevailing, and any such interest shall be simple interest only. The Parties shall be bound by any arbitration award rendered as a result of such arbitration as the final adjudication of any such dispute, controversy, or claim.

17.0 PRIVILEGES AND IMMUNITIES:

Nothing in or relating to this Contract shall be deemed a waiver, express or implied, of any of the privileges and immunities of the United Nations, including its subsidiary organs.

18.0 TAX EXEMPTION

- 18.1** Section 7 of the Convention on the Privileges and Immunities of the United Nations provides, inter alia that the United Nations, including its subsidiary organs, is exempt from all direct taxes, except charges for public utility services, and is exempt from customs duties and charges of a similar nature in respect of articles imported or exported for its official use. In the event any governmental authority



refuses to recognize the United Nations exemption from such taxes, duties or charges, the Contractor shall immediately consult with the UNDP to determine a mutually acceptable procedure.

- 18.2** Accordingly, the Contractor authorizes UNDP to deduct from the Contractor's invoice any amount representing such taxes, duties or charges, unless the Contractor has consulted with the UNDP before the payment thereof and the UNDP has, in each instance, specifically authorized the Contractor to pay such taxes, duties or charges under protest. In that event, the Contractor shall provide the UNDP with written evidence that payment of such taxes, duties or charges has been made and appropriately authorized.

19.0 CHILD LABOUR

- 19.1** The Contractor represents and warrants that neither it, nor any of its suppliers is engaged in any practice inconsistent with the rights set forth in the Convention on the Rights of the Child, including Article 32 thereof, which, inter alia, requires that a child shall be protected from performing any work that is likely to be hazardous or to interfere with the child's education, or to be harmful to the child's health or physical mental, spiritual, moral or social development.
- 19.2** Any breach of this representation and warranty shall entitle UNDP to terminate this Contract immediately upon notice to the Contractor, at no cost to UNDP.

20.0 MINES:

- 20.1** The Contractor represents and warrants that neither it nor any of its suppliers is actively and directly engaged in patent activities, development, assembly, production, trade or manufacture of mines or in such activities in respect of components primarily utilized in the manufacture of Mines. The term "Mines" means those devices defined in Article 2, Paragraphs 1, 4 and 5 of Protocol II annexed to the Convention on Prohibitions and Restrictions on the Use of Certain Conventional Weapons Which May Be Deemed to Be Excessively Injurious or to Have Indiscriminate Effects of 1980.
- 20.2** Any breach of this representation and warranty shall entitle UNDP to terminate this Contract immediately upon notice to the Contractor, without any liability for termination charges or any other liability of any kind of UNDP.

21.0 OBSERVANCE OF THE LAW:

The Contractor shall comply with all laws, ordinances, rules, and regulations bearing upon the performance of its obligations under the terms of this Contract.

22.0 SEXUAL EXPLOITATION:

- 22.1** The Contractor shall take all appropriate measures to prevent sexual exploitation or abuse of anyone by it or by any of its employees or any other persons who may be engaged by the Contractor to perform any services under the Contract. For these purposes, sexual activity with any person less than eighteen years of age, regardless of any laws relating to consent, shall constitute the sexual exploitation and abuse of such person. In addition, the Contractor shall refrain from, and shall take all appropriate measures to prohibit its employees or other persons engaged by it from, exchanging any money, goods, services, offers of employment or other things of value, for sexual favors or activities, or from engaging in any sexual activities that are exploitive or degrading to any person. The Contractor acknowledges and agrees that the provisions hereof constitute an essential term of the Contract and that any breach of this representation and warranty shall entitle UNDP to terminate the Contract immediately upon notice to the Contractor, without any liability for termination charges or any other liability of any kind.



22.2 The UNDP shall not apply the foregoing standard relating to age in any case in which the Contractor's personnel or any other person who may be engaged by the Contractor to perform any services under the Contract is married to the person less than the age of eighteen years with whom sexual activity has occurred and in which such marriage is recognized as valid under the laws of the country of citizenship of such Contractor's personnel or such other person who may be engaged by the Contractor to perform any services under the Contract.

23.0 AUTHORITY TO MODIFY:

Pursuant to the Financial Regulations and Rules of UNDP, only the UNDP Authorized Official possesses the authority to agree on behalf of UNDP to any modification of or change in this Contract, to a waiver of any of its provisions or to any additional contractual relationship of any kind with the Contractor. Accordingly, no modification or change in this Contract shall be valid and enforceable against UNDP unless provided by an amendment to this Contract signed by the Contractor and jointly by the UNDP Authorized Official.

A handwritten signature in black ink, consisting of a stylized, cursive script that appears to be the initials 'PC' followed by a flourish.

Detail Technical Specifications

System Design and Philosophy

1. Design Philosophy

- a. The main objective of the design philosophy is to develop a robust solar irradiance monitoring system with a flexible approach to achieve high quality data and reliability with minimum maintenance efforts. In order to achieve this, the following principles shall be adopted while designing the system.
- b. Technology- Pyranometers with Secondary Standards and should comply with the requirements of ISO 9060:1990 "Solar Energy- Specification and classification of instruments for measuring hemispherical solar and direct solar radiation" and are fully traceable to the World Radiometric Reference (WRR) in Davos, Switzerland. The sensors should have a spectral range (20% points) from 270 to 3000 nm.
- c. The sensors should be integrated with the 4-20 mA current loop technology, which is considered as one of the most robust sensor signaling standard. Additionally, the system should also contain multiple ports to included additional sensors if required.
- d. The integrated system should have the capabilities to transmit the data through different options e.g., radio transmission technology, Wifi module, GSM/GPRS module, GPRS/ GPS module, 3G module, 4G module, Bluetooth low energy module and can be decided which one will be used based on the locally available infrastructure and facilities at place.
- e. The integrated system should have the Industrial Protocols e.g., RS-485, RS-232, CAN Bus and Modbus and can be interfaced with standard devices and sensors.
- f. All the data need to be stored in a central system through the Over the Air Programming using Encryption Libraries to protect the information gathered by the sensors.
- g. Smartphone application will be developed for accessing the data for decision making purpose. This will help the individual to take decision about their solar panel installation of a certain location.
- h. Operation and maintenance is one of the important factors, therefore minimum 5 years operation and maintenance is desired
- i. Training and capacity development is must for this project.
- j. A national solar radiation study will be delivered at the end of the project.

Technical Specification of the Integrated Solar Radiation Measuring Stations

1. Specification of Pyranometer Sensors

Specifications	Details
Classification to ISO 9060:1990	Secondary Standard
Spectral range (50% points)	285 to 2800nm
Analogue output • A-version	4 to 20mA
Analogue output range	0 to 1600 W/m ²
Response time (63%)	< 0.7s
Response time (95%)	< 2s
Serial output	RS-485 Modbus®



Non-stability (change/year)	< 0.5%
Non-linearity (100 to 1000 W/m ²)	< 0.2%
Directional response (up to 80° with 1000 W/m ² beam)	< 10 W/m ²
Temperature response	< 1% (-20°C to +50°C) < 2% (-40°C to +70°C)
Tilt response (0° to 90° at 1000 W/m ²)	< 0.2%
Calibration Uncertainty	< 1.2% (K =2)
Detector type	Thermopile
Field of view	180°
Accuracy of bubble level	< 0.1 °
Power consumption at 12 VDC	V- version : 55 mW A- Version: 100 mW
Operating and Storage temperature range	-40 to +80 °C
Humidity Range	0 to 100 %
MTBF (mean time between failure)	> Years
Ingress Protection (IP) rating	67
Accuracy of bubble level	< 0.1 °
Supply voltage	5 to 30 VDC

2. Specification of Sensor Board and enclosure

Specifications	Details
Material	Polycarbonate
Sealing	Polyurethane
Ingress Protection	IP65
Impact Resistance	IK08
Rated Insulation Voltage AC	690 V
Rated Insulation voltage DC	1000 V
Heavy metals-free	Yes
Weather proof	True- nach UL 746C
Solar Power	Both internal and external panel options
Optional Industrial Protocols:	RS -232. RS- 485, Modbus, CAN Bus
Optional GPS receiver	Yes
External SIM connector for the 4G Module	Yes
Number of Input ports/Channels	4
Sensor Communication	4-20 mA
Internal Memory	2 GB
Supported Radio technology	GSM/GPRS, WiFi, Sigfox, Xbee, LoRa, WAN
Data Communication Protocol	FTP
Battery Capacity	6600 mAh

Q.C.

TERMS OF REFERENCE**FOR CONSULTANCY FIRM CONTRACT**

for

“National Photo Voltaic Resource Assessment Study/Research and Training in Bangladesh”

A. Project Title:
National Photo Voltaic Resource Assessment Study/Research and Training in Bangladesh
B. Background:
<p>Power Division, Ministry of Power Energy and Mineral Resources, GoB is implementing GEF-Funded Project “Development of Sustainable Renewable Energy Power generation (SREPGen)”. The objective of the Project is to reduce the annual growth rate of GHG emissions from the fossil fuel-based power generation by exploiting Bangladesh’s renewable energy resources for electricity generation. The basic approach of the Project will be to promote renewable energy in Bangladesh through the recently established Sustainable and Renewable Energy Development Authority (SREDA). For Bangladesh to achieve a greater share of renewable energy (RE) in its energy mix, the project has four main components that will:</p> <ul style="list-style-type: none"> (i) transform SREDA to evolve into a facilitation centre to support private sector RE investment development; enable regulators to determine fair flexible tariff structures, develop RE power plans, and adopt RE power management and incentive regulations; bring confidence to private RE investors; and increase the number of approved RE projects; (ii) increase capacities of relevant government agencies to generate, process, obtain and disseminate reliable RE resource information for use by GoB and potential project developers and investors; (iii) increase affordability and access to photovoltaic solar power and associated livelihood benefits for low income households; (iv) account increased shares of renewable energy into Bangladesh’s power generation mix; <p>The objective of the assignment is to conduct PV resource assessment through installing 10 Nos. solar irradiance monitoring station across Bangladesh.</p>
C. Objective of the Assignment:
<p>The objective of the assignment is to conduct PV resource assessment through installing 10 Nos. solar irradiance monitoring station across Bangladesh. A high quality solar irradiance study has to be conducted which will inform the spatial and temporal pattern of solar irradiance in Bangladesh. In the process, SREDA officials will be trained also to handle the equipment to be installed under this assignment and other technical aspects. This assignment is combined with research and study where data will be fed by the 10 Nos. solar irradiance monitoring station across Bangladesh. Those monitoring station has to be supplied and installed under this firm contract along with its maintenance advisory support for next one year after the study.</p>
D. Scope of Work
<p>The assignment will require an estimated 15 months of consulting services starting from March 2018 to June 2019. The tasks to be performed by the firm will include, but are not limited to as below:</p>



The Consulting Firm (alone or in association with JV) will provide high-level technical support to SREDA in preparing a nation-wide solar map on which investors can rely for preparing their investment document and GoB can use it for negotiating tariff proposal of PV power generation companies. Scope of work includes following activities but not limited to:

(v) Equipment, Installation and data transmission

For this study at least 10 Pyranometer systems have to be implemented at different locations in Bangladesh. For accessing the data, necessary access to monitor the solar irradiance data has to be provided to SREDA and SREPGEn through web server using smart sensors developed by the firm. A mobile apps need to be developed as well for accessing the solar irradiance data from the stations. *Technical specification of solar irradiance monitoring stations is presented in annex-1. These systems will be transferred to SREPGEn after the study and has to provide one year service in the form of advice regarding technical solution.*

(vi) Monitoring Design

A prefeasibility study has to be conducted for determining of measuring sites for solar irradiance, based on cluster analysis of satellite-derived cloud estimations. Based on the dominance of cloud effect on solar irradiance and the advantage of the high spatial resolution of a geostationary satellite potential location of monitoring station has to be selected. Technical brief needs to be submitted in the technical proposal.

(vii) High Quality Report

A high-quality report of solar irradiance aspects on Bangladesh has to be developed. The aim of this study is to design and implement an integrated system for the real-time monitoring of the available solar potential in Bangladesh with measurements from the proposed solar irradiance monitoring stations, estimation from satellite images and data. This study combines for the first time in Bangladesh measurements of solar energy from an organized network of stations, with satellite images of cloudiness, satellite data of atmospheric suspensions and model calculations, leading to the production of maps and graphs of the capture of solar energy over Bangladesh in detail temporal and spatial scale. The ultimate goal is that the products of the project are useful tools for designing and estimating the energy productivity of solar power units and devices.

(viii) System and Knowledge Transfer

A comprehensive training and capacity building program has to be envisaged in this assignment. The next component is the transfer of technology and knowledge sharing issues for solar irradiance study.

The final outputs/deliverables produced under this consultancy, to be developed in collaboration with the UNDP and GoB team, are the following:

8. *Inception report with methodology and detail work plan*
9. *Pre-feasibility report for potential monitoring sites of solar irradiance stations*
10. *Installation of 10 (Solar Irradiance monitoring) systems and web link*
11. *Detail cook book for the maintenance and other technical related information*
12. *Two Training and Capacity development sessions with report*
13. *Draft report on Solar Irradiance Study and Presentation and Solar Irradiance Apps*
14. *Final report on Solar Irradiance Study on Bangladesh with digital GIS based solar map, finalized Apps, handover of installed 10 monitoring systems and Presentation Material*



The consulting firm will present appropriate work modality/approach, detail ToR. Technical and financial proposal for performing the above assignment. Other interim outputs may be produced to facilitate the completion of the assignment, at the discretion of the Consulting Firm (memos, note to file, mission reports, back-to-office report, etc.). The firm will ensure comprehensive, coherent, high quality reporting, in clear and professional format. In case of doubt, UNDP focal points will determine the format of reporting.

Preparatory activities: The selected firm will thoroughly study the Terms of Reference (ToR) and discuss with the UNDP and GoB counterpart. In consultation with UNDP representative and the GOB focal, the entity will prepare an elaborate work plan detailing the composition of a Team with detail ToR. UNDP will organize an orientation/meeting for the entity to present in detail and ensure a shared understanding. The orientation will cover among others the background to the assignment, objectives and rationale, discussion of the indicators, baseline and procedures, reporting formats and obligations as well as team organization/coordination and logistical arrangements for various missions.

Supervision and Reporting: The Firm will work under the direct supervision of SREPGen Project of UNDP Bangladesh team and in collaboration with the GoB focal (SREDA). UNDP Bangladesh will ensure access to key government counterparts (including access to data and info) and assist the entity/firm with identifying key implementing agencies. All of the communication to UNDP will be reported to Project Manager, SREPGen an Programme Specialist (Environmental Sustainability and Energy), Resilience and Inclusive growth cluster of UNDP Bangladesh.

E. Expected Outputs and milestones

Key Tasks	Timeline (estimated)
8. Inception report with methodology and detail work plan	30 March 2018
9. Pre-feasibility report for potential monitoring sites of solar irradiance stations	1 April, 2018
10. Installation of 10 (Solar Irradiance monitoring) systems and web link	1 June, 2018
11. Detail cook book for the maintenance and other technical related information	1 October, 2018
12. Two Training and Capacity development sessions with report	Two weeks (from Aug to December, 2018)
13. Draft report on Solar Irradiance Study and Presentation and Solar Irradiance Apps	15 April, 2018
14. Complete report on Solar Irradiance Study on Bangladesh with digital GIS based solar map, finalized Apps, handover of installed 10 monitoring systems and Presentation Material	01 July, 2019

F. Impact of Results

This assignment expected to develop a digital solar irradiance map of Bangladesh so that prospective investors can take informed decision and full fill the requirements of bankable documents.

G. Institutional Arrangement

The Firm/Agency/Organization will be contracted by UNDP Bangladesh (on behalf of the Government of Bangladesh) under UNDP's standard rules, condition and regulations. The contracted firm will report to Project Manager, SREPGen in close coordination with Programme Specialist (Environmental Sustainability and Energy) of Resilience and Inclusive growth cluster of UNDP Bangladesh. Project Manager will provide oversight and quality assurance who will also carry out a performance evaluation after successful completion of the assignment.

Any Firm/Agency/Organization/University/Institute/Think Tank/NGO that has relevant professional experiences of conducting such irradiance Study and associated assignment will be eligible for this assignment. A firm or institute or university will be awarded the contract based on their competency prior to quality of technical proposal and the financial proposal. The reputation, track record and capacity of carrying out such assignment would also be considered in selection process.

The composition of the team will depend on the firm/ institutes' best judgment to accomplish the assessment maintaining the high quality and with commitment of timely delivery. The arrangement could be a Team Leader (Principal Consultant) and a team of specialist (e.g. Irradiation Study Expert, Solar Energy Specialist, GIS Specialist, etc.) and research associates and operational assistants (for data and information collation and collection, data analysis, formatting of reports, logistic arrangement, etc.) for conducting nation-wide solar irradiance study in Bangladesh. Ten irradiance monitoring stations will be installed under this consultancy also. Detail CV of all proposed human resources and specification of monitoring stations need to be provided in the proposal with expected deliverables.

H. Duration of the Work and Duty Station

The duration of the assignment will be for 15 months of consulting services starting from March 2018 to June 2019. The Firm/Agency/Institution will incorporate costs of field visits and domestic travel (if required) in their proposal. The assignment will be done mostly in desk review, field visits, monitoring stations installment, data collection via web from the stations, data analysis, stakeholder consultation etc. For collection of information, installation of monitoring stations and to conduct detail studies, visit to remote islands may be required.

The consultants will be based at the PMU Office of SREPGen Project at SREDA, when in Dhaka with some mission to the field. (Approximately 30 days). For rest of the time, they will use their own location (home based) and premise.

I. Final Products/Services/ Deliverables

The consulting firm will deliver following products:

- Inception report with methodology and detail work plan
- Pre-feasibility report for potential monitoring sites of solar irradiance stations
- Installation of 10 (Solar Irradiance monitoring) systems and web link
- Detail cook book for the maintenance and other technical related information
- Two Training and Capacity development sessions with report
- Draft report on Solar Irradiance Study and Presentation and Solar Irradiance Apps
- Complete report on Solar Irradiance Study on Bangladesh with digital GIS based solar map, finalized Apps, handover of installed 10 monitoring systems and Presentation Material

J. Qualification of the successful contractor

This is a high profile assessment requiring senior and professional advice based on substantive experience and qualifications of the contracting entity, that call for a professional team that comprise of one or more experts and a team of required associate staff/s. The firm will be invited to submit a detailed delivery proposal alongside CVs for the team leader, specialists and any associate/assistant staff/s (see below).

Eligibility criteria of the Consulting firm:

- Updated Business Trade Licenses – Registration Papers, Tax Payment Certification, VAT Certificate, etc. including Articles of Incorporation, or equivalent document if Bidder is not a corporation.
- Company Profile, which should not exceed fifteen (15) pages including any printed brochure relevant to the services being procured.
- The firm must submit latest audit report such as (2016-2017, 2015-2016 fiscal years)
- Minimum 10 years of working experience of assessment in the field of climate change, disaster risk management, renewable energy, Irradiance study, etc. and at least 5 years of experience in conducting irradiance study;
- Minimum 5 years of experience of designing and installing irradiance study/ monitoring sensors and its appropriate application;
- Minimum 5 engagements in international/national technical assistance projects focused on renewable energy, climate change, disaster risks management, etc.
- Written Self-Declaration that the company is not in the UN Security Council 1267/1989 List, UN Procurement Division List or Other UN Ineligibility List.
- Only qualified international firms are eligible to participate. However, the firm can propose national consultant in team as specialist to ensure quality of project proposal.

Note: Entities/firms/organizations that do not meet the above eligibility criteria shall not be considered for further evaluation. Necessary documentation must be submitted to substantiate the above eligibility criteria. UNDP reserves all rights to accept or reject any proposal/bid from any firm/organization without assigning any reason whatsoever.

Following three categories of human resources may be required for accomplishing the proposed assignment:

- **Team Leader/Adviser (1);**
- **Specialists/Experts (1);**
- **Data Analyst/Research /Operation Assistants (2)**

a. Minimum eligibility criteria of the Team Leader/Adviser/Lead Consultant:**ACADEMIC QUALIFICATIONS**

- M.Sc. in relevant discipline (environmental sciences, electrical, mechanical, renewable energy or technology and resources management degrees);
- Must have an Advance degree (Ph.D in environmental, climate, energy or technology management related field)

EXPERIENCE

- Minimum 10 years of professional experience of which 5 years in related subject
- Must have experience in leading at least five international assignments related to implementation on renewable energy projects -
- Extensive international experience in designing and monitoring of weather and energy related projects. Previous experiences on designing and implementation of solar PV monitoring system is desired;



- Must have experiences of at least three years on leading projects on sensor technology, data integration and assessment and able to demonstrate web based system and data integration platform
- Must have excellent report writing skills and experience in writing and presenting reports to a high professional and policy level (which includes graphs, pictures, diagrams, figures and other illustrative tools to enhance the reporting quality);

b. Minimum eligibility criteria of other Specialist/Expert

I. Academic Qualifications:

Minimum Master's in relevant fields (e.g. Renewable Energy, Environmental science, Engineering, Economist, Development Planning, GIS Expert, Mitigation/Energy Expert, etc.)

II. Years of experience:

1. Minimum 5 years of progressive experience in conducting similar assignment
2. Experience of completing at least 3 assignments in similar field. List of completed research/publication to be enclosed in CV.

c. Minimum eligibility criteria of other Research Assistant/Operational Support Staff

I. Academic Qualifications:

Minimum Graduate degree in the field of Environment science, Engineering, Economics, development planning, Business Administration

II. Years of experience:

3. At least 2 years of progressive experience in conducting similar assignments (especially in data collection, survey, data analysis and reporting);
4. Experience of completing at least 2 assignments in similar areas.

Competencies required for all proposed human resources:

1. Must have computer literacy especially on MS Office applications;
2. Must have excellent writing, editing, and oral communication skills in English and Bangla;
3. Must have track record in good financial management and reporting mechanism

K. Scope of Bid Price and Schedule of Payment

Key Tasks	Timeline (estimated)	Payment Schedule
1. Inception report with methodology and detail work plan	15 March 2018	15%
2. Pre-feasibility report for potential monitoring sites of solar irradiance stations	1 April, 2018	15%
3. Installation of 10 (Solar Irradiance monitoring) systems and web link	1 June, 2018	30%

4. Detail cook book for the maintenance and other technical related information	1 October, 2018		
5. Two Training and Capacity development sessions with report	Two weeks (from Aug to December 2018)		
6. Draft report on Solar Irradiance Study and Presentation and Solar Irradiance Apps	15 April, 2018		
7. Complete report on Solar Irradiance Study on Bangladesh with digital GIS based solar map, finalized Apps, handover of installed 10 monitoring systems and Presentation Material	01 July, 2019	40%	

Remuneration of the successful contractor will be fixed and bids should be submitted on this basis. No adjustment will be given for the period and determined by the specified outputs as per this TOR. The price should take into account all HR costs and professional fees, instrument rent, travel costs, DSA, subsistence and ancillary expenses.

UNDP shall effect payments, by bank transfer to the consultancy firm's/organization's bank account, upon acceptance by UNDP of the deliverables specified in the ToR.

Invoices shall indicate the milestones achieved and corresponding amount payable.

The contracting agency should follow the plan and procedures as outlined in the work contract. Payment will be made through Electronically Fund Transfer (EFT) to the account of the consulting firm/Institute. For each installment the firm has to submit a request letter duly signed and describing the agreed accomplishment. The final payment will be made upon acceptance of the final reports, soft files and hard data.

L. Recommended Presentation of Proposal

Interested firms/entities must submit the following detailed proposal made up of documentation to demonstrate the qualifications of the prospective firm, to enable appraisal of competing bids. This should include technical and financial proposals, details of which are listed below.

1. Technical Proposal

The entire technical proposal should be limited to 15 pages maximum, plus relevant annexes.

- (i) **Firm/Institute information** – Name of Firm and details of registration, address and bank account; business registration certificate and corporate documents (Articles of Association or other founding authority) or any appropriate legal document (e.g. relevant document in case of university or academic/research institute); description of present activities and most recent annual report (including audited financial statements), if applicable;
- (ii) **Relevant Experience** – Description of experience in research/study projects of a comparable nature, with specific description of technical specialization of the Firm/institute in the field of scientific/social research/study, and list of current and past assignments of the Firm;
- (iii) **Process** - The Technical Proposal needs to contain a detail description of the process the firm/organization intends to follow to complete the tasks including a detailed work plan and

time schedule for completion/delivery of the final product (the updated and revised text of the BD codes) which, after selection of the firm/organization, will be agreed upon by the Project.

- (iv) **Human Resources** - The Technical Proposal needs to contain a list and detailed information on the proposed Human Resources/experts (with detail CV) which will be utilized for the task including their respective qualifications and relevant experience/exposure and required expertise/skills to complete the tasks i.e. legal, linguistic, drafting and editing expertise, among others.
- (v) **Tools and Methodologies** - The Technical Proposal must detail tools and methodologies that will be used to ensure the accuracy of the update and revision by the firm/organization. In particular, in order to deliver the task to the highest standard, checks using processes including software-built processes should be applied by the selected firm/organization.
- (vi) **Related goods and services** – The study requires installing 10 monitoring stations including sensors and data loggers which will be transferred to SREPGen after the study. The proposal must present their own specification or agreement to comply with the specification presented in annexure-1. One year advisory service has to be provided for operation and maintenance of those monitoring stations.

2 references to be provided by the contractor where previous work has been undertaken.

- 2. Financial Proposal** (including operational fee, travel cost, DSA, support service and other relevant expenses)
 - (i) The Financial Proposal shall specify a total delivery amount (in USD) including consultancy fees and all associated costs, i.e. travel cost, survey, DSA, printing costs, consultation workshop costs and overheard recharges.

In order to assist UNDP in the comparison of financial proposals, the financial proposals will include a detail breakdown of this amount disclosing the key assumption employed in costing the working. The costing must be broken down for the update and revision of specified legal texts on price per page of source text of the submitted or finished updated and revised text.

The cost of preparing a proposal and of negotiating a contract, including any related travel or survey, is not reimbursable as a direct cost of the assignment.

M. Evaluation

In response to the RFP, the firm/organization will have to submit a **Technical Proposal** as per the Terms of Reference and a **Financial Proposal** separately. The tender selection committee will first evaluate the technical proposal of the institutions/firms. Any institutions/firms getting more than 70% of the maximum achievable points (i.e. 49 points) in the technical proposal will be considered for financial appraisal, and ultimately therefore, for contracting. The financial proposal will be evaluated based on lowest price.

The total scoring points for both the evaluations will be 100; the technical evaluation will be based on 70 points and the rest 30 points are to be allotted to the bidder proposing lowest price.

A cumulative analysis weighted-scoring method will be applied to evaluate the firm. The award of the contract will be made to the tenderer whose offer has been evaluated and determined as:

- a) Responsive/compliant/acceptable with reference to this ToR, and;
- b) Having received the highest score out of a pre-determined set of weighted technical and financial criteria specific to this solicitation, with the ratio set at 70:30 respectively.

BASIS FOR EVALUATION

Criteria	Weight	Max. Points
Technical		
1. Overall experience and qualifications of the firm/organization		
Experience and qualification of firm/organization		5
Experience with similar assignment in last 10 years		10
Volume of Similar job completion task or assignment		5
2. Methodology proposed in the technical proposal		
Adequacy of proposed work plan and coverage of thematic areas relevant to the assignment as per the Terms of Reference		10
Demonstrated understanding of the assignment particularly on ToR of Team Leader and other specialists/expert	70	3
Appropriateness and relevance of approach and methodology		10
Matching with the specification of the monitoring stations (Sensors/loggers etc.) to be compared with the given specification (e.g. 90% matching-full points)		10
3. Skills and experience of experts nominated		
Suitability of team composition for the assignment (number and type of experts)		2
Qualification, experience and skills of the Team Leader/Lead Consultant		10
Qualification, experience and skills of the Specialist/Expert/ Research/ Assistant		5
Financial	30	
Total	100	

Annex-01: Detail Technical Specifications**System Design and Philosophy****3. Design Philosophy**

- The main objective of the design philosophy is to develop a robust solar irradiance monitoring system with a flexible approach to achieve high quality data and reliability with minimum maintenance efforts. In order to achieve this, the following principles shall be adopted while designing the system.
- Technology- Pyranometers with Secondary Standards and should comply with the requirements of ISO 9060:1990 "Solar Energy- Specification and classification of instruments for measuring hemispherical solar and direct solar radiation" and are fully traceable to the World Radiometric Reference (WRR) in Davos, Switzerland. The sensors should have a spectral range (20% points) from 270 to 3000 nm.
- The sensors should be integrated with the 4-20 mA current loop technology, which is considered as one of the most robust sensor signaling standard. Additionally, the system should also contain multiple ports to included additional sensors if required.
- The integrated system should have the capabilities to transmit the data through different options e.g., radio transmission technology, Wifi module, GSM/GPRS module, GPRS/ GPS module, 3G

module, 4G module, Bluetooth low energy module and can be decided which one will be used based on the locally available infrastructure and facilities at place.

- e. The integrated system should have the Industrial Protocols e.g., RS-485, RS-232, CAN Bus and Modbus and can be interfaced with standard devices and sensors.
- f. All the data need to be stored in a central system through the Over the Air Programming using Encryption Libraries to protect the information gathered by the sensors.
- g. Smartphone application will be developed for accessing the data for decision making purpose. This will help the individual to take decision about their solar panel installation of a certain location.
- h. Operation and maintenance is one of the important factors, therefore minimum 5 years operation and maintenance is desired
- i. Training and capacity development is must for this project.
- j. A national solar radiation study will be delivered at the end of the project.

Technical Specification of the Integrated Solar Radiation Measuring Stations

2. Specification of Pyranometer Sensors

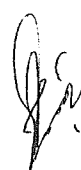
Specifications	Details
Classification to ISO 9060:1990	Secondary Standard
Spectral range (50% points)	285 to 2800nm
Analogue output • A-version	4 to 20mA
Analogue output range	0 to 1600 W/m ²
Response time (63%)	< 0.7s
Response time (95%)	< 2s
Serial output	RS-485 Modbus®
Non-stability (change/year)	< 0.5%
Non-linearity (100 to 1000 W/m ²)	< 0.2%
Directional response (up to 80° with 1000 W/m ² beam)	< 10 W/m ²
Temperature response	< 1% (-20°C to +50°C) < 2% (-40°C to +70°C)
Tilt response (0° to 90° at 1000 W/m ²)	< 0.2%
Calibration Uncertainty	< 1.2% (K =2)
Detector type	Thermopile
Field of view	180°
Accuracy of bubble level	< 0.1 °
Power consumption at 12 VDC	V- version : 55 mW A- Version: 100 mW
Operating and Storage temperature range	-40 to +80 °C
Humidity Range	0 to 100 %
MTBF (mean time between failure)	> Years
Ingress Protection (IP) rating	67
Accuracy of bubble level	< 0.1 °

Supply voltage

5 to 30 VDC

4. Specification of Sensor Board and enclosure

Specifications	Details
Material	Polycarbonate
Sealing	Polyurethane
Ingress Protection	IP65
Impact Resistance	IK08
Rated Insulation Voltage AC	690 V
Rated Insulation voltage DC	1000 V
Heavy metals-free	Yes
Weather proof	True- nach UL 746C
Solar Power	Both internal and external panel options
Optional Industrial Protocols:	RS -232, RS- 485, Modbus, CAN Bus
Optional GPS receiver	Yes
External SIM connector for the 4G Module	Yes
Number of Input ports/Channels	4
Sensor Communication	4-20 mA
Internal Memory	2 GB
Supported Radio technology	GSM/GPRS, WiFi, Sigfox, Xbee, LoRa, WAN
Data Communication Protocol	FTP
Battery Capacity	6600 mAH



Declaration

Date:

United Nations Development Programme
UNDP Registry, IDB Bhaban, Agargaon
Sher-E-Bangla Nagar, Dhaka, Bangladesh

Assignment Hiring a firm for conducting a National Photo Voltaic Resource Assessment Study/Research and Training in Bangladesh for SrepGen Projects of UNDP Bangladesh

Reference: RFP-BD-2018-005

Dear Sir,

I declare that is not in the UN Security Council 1267/1989 List,
UN Procurement Division List or Other UN Ineligibility List.

Yours Sincerely,

