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REQUEST FOR EXPRESSIONS OF INTEREST
(CONSULTING SERVICES– FIRMS SELECTION)

Country: India
Project Name: Innovations in Solar Power & Hybrid Technologies Project
Loan No./Credit No./Grant No.:
Assignment Title: Selection of Owners Engineer (OE) required during Design, Engineering, Supply, Construction, Erection, Testing & Commissioning of 160 MW Solar-Wind Hybrid Power Plant with BESS including Plant O&M at Ramagiri, Anantapur district, Andhra Pradesh, India
Reference No. (as per Procurement Plan): IN-SECI -101391-CS-QCBS

The **Solar Energy Corporation of India (SECI) Limited, New Delhi** has applied for financing from the World Bank towards the cost of the Project; Innovations in Solar Power & Hybrid Technologies, and intends to apply part of the proceeds for this consulting services.

The consulting services ("the Services") include – Owner's Engineer (OE) to provide support in line with Design, Supply & Installation (DSI) contract documents to SECI during the detailed design review for overall project, supervision of supply, construction, erection, testing and commissioning as well as supervision of the initial operations of the project for 01 year. The estimated duration of this consultancy/OE services to SECI is for a total period of 30 (Thirty) months which primarily includes the Project commissioning timelines of 18 Months plus 12 months of the first year Project operations. SECI may decide to continue with the services of OE after one year of stabilized operations subject to satisfactory performance and terms and conditions and scope of services to be mutually agreed either through extension of the contract or through a new contract.

The Owner's Engineer services are structured as:

Part A -During detailed design: During this phase, the OE is expected to support SECI in the due diligence of the basic & detailed design provided by the DSI contractor covering solar, wind, BESS and balance of plant (BOP) technologies, construction schedules, tests, guarantees etc.
PART B -During project construction, testing and commissioning: The OE shall support SECI to supervise execution of the entire DSI contract in the letter and spirit in line with the terms and conditions of the contract and shall closely monitor the contractor's execution plan, construction schedule, quality control, inspection, etc.
PART C-During Operation: The OE shall deploy technically qualified manpower to supervise & monitor the OMS undertaken and provide weekly monitoring reports for a period of 1 year post commissioning.
PART D-Capacity Building: The OE shall help build capacity of SECI to be able to supervise engineering designs, construction and operations of hybrid projects.

The detailed Terms of Reference (TOR) for the assignment can be downloaded from SECI's website: ***www.seci.co.in & UNDB website.***

SECI now invites eligible consulting firms ("Consultants") to indicate their interest in providing such Services. Interested Consultants should provide information demonstrating that they have the required qualifications and relevant experience to perform these Services. **The shortlisting criteria are:**

1. The consultant must have experience of having successfully completed similar works in last (07) seven Financial years as on the last date of EOI submission.
2. The consultant must have experience of having successfully completed one similar works costing not less than **INR 2,50,00,000/- (Indian Rupees Two and half Crores)** in last (07) seven Financial years as on the last date of EOI submission.
3. Minimum Average Annual Turnover (MAAT) of the consultant in the last three financial years should be **INR 1,20,00,000/- (Indian Rupees One Crore & Twenty Lacs only)**. MAAT shall mean Revenue from Operations as incorporated in the profit & loss account excluding other income, e.g. sale of fixed assets. This must be the individual Company's turnover and not that of any group of Companies.

   "Similar works" means, the consultant must have provided consultancy services in Solar & Wind Sector Projects as Owner's Engineers or as Lender's Engineer or as Implementation Support Consultant".

   Following documents are required in support of the above criteria's:
   a) Brief description of the organization including ownership details, date and place of incorporation of the firm, objectives of the firm, details of assignments undertaken establishing the credentials of the consultant in the RE Sector in last 07 years.
   b) Client Contract/work order copies or Performance certificates indicating the scope & cost of the project
   c) A summarized sheet of average turnover, certified by a practicing Chartered Accountant/Statutory Auditor should be compulsorily enclosed along with corresponding annual accounts.

Pls note that the Key Experts will not be evaluated at the shortlisting stage.
The attention of interested Consultants is drawn to Section III, paragraphs,3.14, 3.16, and 3.17 of the World Bank's "Procurement Regulations for IPF Borrowers" July 2016, revised November 2017 and revised August 2018 ("Procurement Regulations"), setting forth the World Bank's policy on conflict of interest.

Consultants may associate with other firms to enhance their qualifications, but should indicate clearly whether the association is in the form of a joint venture. In the case of a joint venture, all the partners in the joint venture shall be jointly and severally liable for the entire contract, if selected.

A Consultant will be selected in accordance with the **Quality and Cost Based Selection (QCBS)** method on **Lump sum contract basis** set out in the World Bank Procurement Regulations. Expressions of interest (not more than 60 pages) must be delivered in written form or Digital form to the address below (in person or by courier or by e-mail) by **16th March 2019**.

Solar Energy Corporation of India Limited
D3, Wing A, Ist Floor, Prius Platinum Building,
Saket District Centre, Saket, New Delhi 110017
Kind Attn.: Mr Sandeep Kumar, Manager (C&P)
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TERMS OF REFERENCE

for

Provision of Owners Engineer (OE) services for Solar-Wind Storage Project in Andhra Pradesh

During Design, Construction, Commissioning and Operations

(Under Proposed India: Innovations in Solar Power & Hybrid Technologies)

1. Background:

The 'Owner' M/s Solar Energy Corporation of India (SECI) Limited is developing a large scale solar-wind hybrid project with battery energy storage solutions (BESS) with a capacity of about 160 megawatts (MW) in which the Solar capacity is 120 MW (AC), Wind capacity 40 MW & BESS capacity as 10 MW, 20 MWh in Ramagiri Ananthpur district, Andhra Pradesh (AP). SECI intends to use part of World Bank loan and Clean Technology Fund financing towards the implementation of this project.

With reference to the Design, supply & Installation (DSI) Contract, SECI seeks to appoint an Owner's Engineer (OE) whose primary task shall be to assist and monitor the process during the detailed design, construction, commissioning and initial operations of the plant to be undertaken by the DSI Contractor.

SECI may decide to continue with the services of OE after one year of stabilized operations subject to satisfactory performance and terms and conditions and scope of services to be mutually agreed either through extension of the contract or through a new contract.

2. Objective:

OE shall provide support in line with DSI contract documents to SECI during the detail design review for overall project, construction supervision, supervision of testing and commissioning as well as oversight during initial operations of the project for 1 year.

3. Scope of Services:

OE shall start their evaluation of the engineering designs, the work plans, the quality action plans, field quality plans and site project monitoring phase followed by Project commissioning and Operation & Maintenance (O&M) phase During induction phase, the selected OE will also work closely with SECI or its hired engineering firms to understand various project design and sizing parameters including engineering assumptions made during the tendering phases per the DSI contract terms and conditions only.

The OE will assist the SECI (Owner) and will act under the directions of the Owner and will be delegated to the extent required for performance of these scope of services. The general OE scope shall comprise (broadly) the following activities (detailed hereinafter 'Part A' below):

A. During Detailed Design phase – Preparation of Project Planning and Monitoring framework, Evaluation of the project design proposed by the DSI Contractor including conformance with ESMP measures already identified to be implemented in design phase; review of construction arrangements, construction drawings and documents (to be furnished by the DSI Contractor to be selected by the SECI) including performance witnessing and analysis assessment of construction risks and issues; review of the solar and wind resources, respective technologies and energy yields; assessment of battery use, cases' duty cycles proposed by DSI Contractor, Review project's integration into the grid. ; review of As-built drawings of the Project, review

the DSI contractor's O&M arrangements and capabilities or any other tasks required for the successful completion of the design phase.

B. During project construction, testing and commissioning– Supervise the execution of the contract in consultation with SECI to ensure the contract is executed in full conformity with contract conditions, with specific requirements that OE will provide on-site monitoring of project progress throughout the construction period of the project, providing suggestions for correction and improvements as required; review and comment on the appropriateness and implications of any change orders;, and issue draw and/or milestone certificates (as necessary); confirm compliance with agreed-upon ESMP requirements including but not limited to environmental, health and safety measures;, monitor transmission line and substation construction and interface with APTRANSCO, Review completion test procedures and results; assess contractor compliance with performance tests and/or payment of penalties as defined in their respective construction or supply contracts and issue an opinion as to conformance; review punch lists for each contract; witness and issue a professional opinion on the performance tests; and issue provisional and final certificates of completion as defined in the conditions of the contract. SECI requires that the OE will organize monthly progress review meetings with the contractor in association with SECI and provide weekly reports throughout the construction period of the project. SECI also requires that the OE mobilizes at Ramagiri site location with appropriate experts for the full duration of this Phase.

C. During commercial operation - The OE shall remain available for monthly review visits to the plant for a period of 1 year (extendable under conditions described in this Terms of Reference). The OE will undertake analysis to cover Variances between the historical and projected operating budget and the O&M expenses shown in the pro forma used for financial closing; variances and explanations for variances between the historical and projected project performance as shown in the pro forma used for financial closing; discussions of equipment or other O&M related items that occurred over the previous reporting period; changes and explanations for changes to the O&M procedures and plans that may have affected historical or affect future project performance, and; any major equipment failures, significant O&M events, warranty items or occurrences that would affect historical or future project performance. A comprehensive report will be the outcome of each visit covering the analysis hereinabove with remedial measures which will be discussed with SECI.

D. Capacity building - The OE is also expected to build capacity at SECI to be able to effectively supervise the O&M work in later years of operations (once independent OE task is completed with/without any extensions), supervise design and construction of future projects and provide on the job training for SECI engineers involved in this project. The OE will also help SECI prepare an O&M plan and training plan.

PART A - During detailed design:

During this phase, the OE is expected to support SECI in the due diligence of the detailed design provided by the contractor, solar, wind, battery and balance of plant (BOP) technologies, construction schedules, tests, guarantees and O&M undertaking the following tasks:

Task A.1: Review Project Design, Construction and Operating Plans: Project Planning: Establishment of Project Monitoring Cells at SECI HQ, Delhi and Site, Review of the L2 and L3 Schedules submitted by the DSI Contractor, periodic review of supply schedules in co-ordination with site activities, identification of project management critical paths and raising timely alerts, monitoring of sub-contracts, Review the technical design of the Project and projected performance for compliance with tender documents, internationally accepted industry standards & practices. OE will provide an opinion

on the quality of design and equipment with respect to its service life, as well as the operating history of major equipment. More specifically, the following should be addressed (including but not limited to):

1. Assess the quality of modeled/measured site solar and wind data, other reference data and meteorological data.

2. An independent analysis including:

   Wind resource
   a. Wind regime assessment at turbines locations
   b. Turbulence assessment
   c. Site suitability certification assessment
   d. Assessment of inter-annual, seasonal variations in wind resource and its quantification – over last 5 years and over the 10 years preceding,
   e. Assessment of the impact of climate / weather (precipitation, temperature, humidity) at site on plant performance, including battery cooling requirements
   f. Battery and Battery Management System (BMS) design for the proposed use cases

3. Independent review of energy projections, including:

   a. Review of macro and micro siting of wind turbine generators (WTG)
   b. Review of siting for each solar field and solar plant layout
   c. Review of shading assessment
   b. Estimate of the gross energy production (solar and wind separately and in hybrid operation mode)
   c. Assessment of the losses (solar and wind separately and in hybrid operation mode)
   d. Assessment of the Plant Management Control Systems and its ability to balance overall production (from wind & solar) with storage utilization in such a way to maximize plant revenues as per the PPA
   d. Assessment of the net energy production (solar, wind and hybrid with battery system, including parasitic battery losses particularly from but not limited to cooling)

4. Review of the proposed project design, including: i) suitability of the wind turbine equipment (RLMM compliant), solar panels, central inverters, batteries, control systems (SCADA and Energy Management Systems); transformers, electrical systems (A.C & D.C), ii) plant design requirements; iii) proposed design of project facilities.

5. Review of original equipment manufacturer (OEM) technical specifications, drawings and test reports, and work instructions and protocols.

6. Review the proposed site layout, and the mechanical and electrical layouts.

7. Review of design, drawing, testing and soil investigation reports of all civil foundation (WTG, solar mounting pile, transformer etc.,), roads, control room, drain, fence, cable trench and other civil works with suitable recommended structures/foundations. All electrical system review like equipment designing, engineering drawing, cable schedule, earthing, transmission line system, lightning, fire-fighting system etc., ensuring proper design and functionality requirements for integration of solar, wind & storage system (BESS), design requirements for availability of real time data at state load dispatch center (SLDC) (as per requirement of SLDC). Review with AP DISCOM and APTRANSCO design, drawing and testing of all electrical BOP works (substation, bay-extension, transmission lines, etc.). Review of all As-Built drawings of the Project. Design

review of all the components linked to the said hybrid project is in the scope of OE (and not limited to the above).

8. Review of design pertaining to BESS, SCADA and EMS

9. Review design, performance as well as the systems' historical and projected reliability and operations under various operating conditions.

10. Transfer of skills and experience to the SECI HQ and field teams in implementing and operating the proposed solar-wind hybrid with storage project.

11. Risks and issues associated with the proposed wind-solar hybrid with storage project to be identified

12. Opine on the capacity and stability of the electrical grid in respect of the impact of the Project . The review shall include:

Generation, load patterns, short circuit levels, protection coordination, statistics and characteristics of grid system, based on such studies as prepared by others.

13. Join any meetings with APERC (AP regulator), APSPDCL (AP DISCOM), APTRANSCO , NREDCAP or any other agency as required by SECI.

14. Review of (i) compliance with the World Bank's Environmental and Social requirements, and, (ii) consistency of the mitigation measures proposed in the environmental and social impact assessment with the plant design.

Task A.2: Site Visit and Review**:** Visit the Project site as per instruction of SECI for smooth design implementation of project site. Review and comment on:

1. Site topography, terrain, and soil conditions for development and logistics impacts.
2. General condition of the grounds and equipment.
3. Access to available transportation, including roads and bridges, ports, railroads, airports for equipment maintenance, supply and replacement considerations.
4. Visual, environmental and social impacts.
5. Weather conditions (extreme wind conditions).
6. Any other material factors

Task A.3: Review Project Construction Plan and Documentation: Items to be reviewed and commented on include, but are not limited to:

1. Review completion requirements including performance guarantees and associated liquidated damages,
2. Review the proposed construction schedule, discuss the schedule with construction contractor(s), and determine whether adequate provisions have been made for design; for equipment procurement, fabrication, shipment and installation; and for start-up, shakedown, and testing of the Projects. Unknown or variable elements in the schedule will be identified, along with associated potential risks.
3. Review the planned drawdown schedule and comment whether the planned monthly drawdown is consistent with the Projects schedule.
4. Review and comment with respect to: specific milestones, ability to achieve milestones, expedite the milestone achievement process, completion terms and operational ramp up period.

5. Review of all documents submitted by DSI) contractor like Quality Assurance Plan, Field Quality Plans, EHS plan, Environment and social risk and mitigation.

Task A.4: Review Tests and Guarantees: In compliance with DSI contract requirements and other international practices, the OE will be required to review tests and guarantees proposed by the contractor. The OE will specifically:

1. Review performance guarantees, including guarantees provided by equipment manufacturers. Advise on the need for additional insurance, if any.
2. Review test criteria as proposed by contractors and suppliers and comment on reasonableness of test criteria, ability of the test(s) to unambiguously demonstrate whether the contractor and suppliers' guarantees are met.
3. Conformance of test procedures to established codes and standards for testing Projects equipment.
4. Comment on the minimum performance criteria the Projects will be required to demonstrate as conditions precedent to Projects completion.

Task A.5: Document Review of Project's O&M: Review the project's O&M program for compliance with generally accepted and prudent utility practices, and the ability to operate in accordance with Pro Forma projections. Items to be reviewed include:

1. Corrective, preventive and predictive maintenance management systems, processes and procedures.
2. Reporting requirements.
3. Annual budgeting procedure.
4. Compliance with Project agreements and permits.

5. Review and make recommendations on major equipment maintenance program for the project life period. Minimum maintenance requirements (in accordance with those recommended by the Manufacturer in O&M manuals).

Task A.6: Review the ability of the Project, based on the design criteria, to meet the operating and technical requirements of the applicable operational agreements.

Task A.7: Review of Permits and Licenses: Assess the ability of the Project, based on design criteria and intended modes of operation, to meet and maintain compliance with technical requirements of the applicable major permits including but not limited to following:

1. Transmission system interconnection permits, CEIG, CEA etc.
2. Other permits and licenses including necessary local and state permits E.g. for storage of hazardous material from State Pollution Control Board.

Task A. 8: Financial Model: The scope of work will include the development of a financial and economic model for the project for SECI in close collaboration with the SECI's finance team. The OE, along with the SECI will develop the following assumptions in a manner that is reasonable and consistent with the design of the Project, expected operating scenarios, and Project agreements:

1. Project performance and reliability.
2. Penalty or time extension recommendations as per contract
3. Greenhouse gas emissions and other key performance indicators agreed between SECI and the World Bank

PART B -During project construction, testing and commissioning:

The OE shall support SECI to supervise execution of the contract in the letter and spirit of the DSI contract terms and conditions and shall closely monitor the contractor's construction management team and ensure it has appropriate resources and expertise. Oversight during construction shall include all tasks for successful execution of the contract, which include but are not limited to the following tasks:

Task B.1: Confirm that the required conditions precedent to Project completion have been satisfied from a technical perspective.

Task B.2: Observe the Contractors construction supervision program to ensure it is as agreed upon in the legal (financing) documents and that there is adequately qualified construction supervision staff on site; and that the contract management and control team is sufficiently experienced and qualified.

Task B.3: As required by SECI, witness the critical factory tests and inspections for major plant equipment. List of major items for inspection to be finalized amongst SECI, Contractor and OE at project design approval phase, but will include (though not limited to) wind turbine blades, nacelle, towers, solar modules, String Monitoring Boxes, SCADA, inverters and transformers – both HT and LT, along with HT cables, Battery storage units, EMS and BESS. In case OE is unable to attend factory inspections at overseas locations, they will depute reputed Third- Party Inspection agencies to witness the factory inspections as per approved QAP, Battery storage units, EMS and BESS etc.,

Task B.4: Progress monitoring and schedule review to ensure that the work being planned and scheduled by the contractors is supportive of a plant in-service date as specified in the project schedule.

Task B.5. Review acceptance and performance testing procedures

Task B.6: Review the procedures and results of factory testing and represent the SECI as needed for all the key tests.

Task B.7: Assess if adequate QC/QA programs and procedures are in place and being followed.

Task B.8: Assess if appropriate construction environmental, health and safety standards are being enforced and are as per the loan agreements for each of the sub-activities – viz pertaining to Civil, Electrical and Mechanical works.

Task B.9: Issue certificates of Milestone compliance as per the DSI contract agreements that shall confirm, inter-alia, that all conditions of the DSI agreements are being met, that observed construction progress matches the agreed project completion schedule, that agreed-upon environmental, health and safety and social measures are in place, that construction and contract management is of acceptable quality.

Task B.10: Provide measurement certification, payment recommendation, and technical input for waiver.

Task B.11: The OE shall endorse within 4 business days the Material Receipt Note / Work Completion Certificate with all supporting documents which acknowledges the quality and completeness of components of WTG, Solar, Battery and BOP components for payment milestones. If not complete or not of satisfactory quality reasons need to be provided within the same timeframe.

Task B.12: The OE shall provide turbine foundation design verification based on geotechnical soil samples and turbine design loads document within 10 days of receipt of soil quality report, design loads and foundation design documentation. Similar process would be followed for the solar plant

foundations as well. In the event that turbine/solar foundation design is found to be unsuitable, recommendations for improvement need to be made by the OE within the same 10 business day period. The OE must work with contractor/OEM to ensure that turbines are constructed in accordance with any recommendations made as a result of improvements suggested. Review pour cards of foundation and review quality of foundation cube tests as completed by contractor/OEM. Quality control based on Indian Standard codes for the supplies and works as part of the foundation construction.

Task B.13: The OE shall supervise commissioning of all WTGs, each solar field, and battery storage system from construction of platform/foundation to erection and testing for achievement of commercial operation.

Task B.14: The OE responsibilities shall include monitoring of construction activities of 33 kV internal lines along with substation. The OE shall also supervise Construction of internal roads and approach roads including side drains and cross drainage works.

Task B.15: Review the protection requirements as per grid code/state electricity board and confirm that the appropriate equipment is procured and installed in accordance with all relevant requirements for the electrical works of the Project

Task B.16: Review of the protection equipment's GA Diagram and SoP (Standard Operation Procedure) of all Protective Equipment installed in the Project

Task B.17: Monitor Installation of SCADA system along with facility provided for O&M according to Standard procedure of OEM. Checking & Confirming that the SCADA systems of each wind turbine and solar field are fully functional and accessible from remote locations and that raw data can be downloaded in real time to allow for scheduling of power with respect to Standard Procedure of OEM. Ensuring & monitoring that WTGs, solar fields and battery storage are safe for Energisation according to the Pre-Commissioning Procedures as provided by OEM and based on the consultant's expertise on quality and completeness of work.

Task B.18: Monitor installation of the Energy management system (EMS) that integrates the wind, solar and battery storage; Ensure suitable interfaces with respective SCADAs and BMS; Supervise hybrid project testing and initial operation and control through the EMS. Review recommended EMS operational protocols/work instructions provided by the contractor/OEM.

Task B.19: Contract completion testing- review test protocols, ensure test witnessing plans are adequate and confirm the test results.

Task B.20: Penalties- confirm that if penalties or LDs have been paid by contractors and/or suppliers and, if so, that they are in accordance with the DSI contract documents

Task B.21: Punch Lists- evaluate punch lists for the contracts and confirm they appear comprehensive and professional.

Task B.22: Tests- agree with the test protocols, witness any system connection tests and confirm the results.

Task B.23: Issue, in accordance with the DSI agreements, certificates of project partial completion and project completion. These completion certificates would not necessarily correspond to those in the individual construction contracts

Task B.24: All insurance respect of the Personnel of the OE and of any Sub-Consultant, in accordance with the relevant provisions of the Applicable Law, as well as, with respect to such Personnel, any such life, health, accident, travel or other insurance shall be in the scope of OE.

PART C - During Operation:

The OE shall deploy technically qualified manpower at site to monitor the OMS undertaken and provide weekly monitoring report for 1-year post commissioning and report on all units of the Project in operation. The OE's report to SECI during supervision of operations shall include:

Task C.1: Any variances and explanations for variances between the historical and projected project performance as shown in the pro forma used for financial closing;

Task C.2: discussions of equipment failures or other O&M related items that occurred over the previous reporting period;

Task C.4: Changes and explanations for changes to the O&M procedures and plans that may have affected historical or affect future project performance, and; any major equipment failures, significant O&M events, warranty items or occurrences that would affect historical or future project performance.

PART D - Capacity Building:

The OE will also help build capacity at SECI to be able to supervise engineering designs, construction and operations of hybrid projects. This may involve the following tasks:

Task D.1: Prepare a training plan for project engineers acceptable to SECI management covering some theoretical as well as on the job training

Task D.2: Provide training on structuring and drafting suitable O&M contracts, O&M contract management as well as construction management.

Task D.3: Training for Employer's O&M Personnel

1. The scope of service under training of Employer's engineers shall include a training module in the area of O&M. Such training should cover the areas (not limited to), such as, breakdown maintenance, routine maintenance, preventive maintenance, list of major spares and their functioning, functioning of SCADA, etc.), environmental aspects that need to be handled during O&M period, as a minimum in order to enable these personnel to individually take the responsibility of operating and maintaining the plant in a manner acceptable to the Employer.
2. Consultant shall furnish in his offer, details of training module(s) covering above requirements which shall be subject to Employer's approval. Exact details, extent of training and the training schedule shall be finalized based on the Consultatnt's proposal within two (2) months from placement of award.

4. Activities and Timelines:

(i) Activities: The OE shall be required to work along with SECI within the reasonable limit as prescribed by the SECI. The below list is indicative and will be expanded / refined during the contract award/execution time.

S.no	Activities of Project	Time frame
1	Contract agreement signing and Kick of Meeting along with Detailed completion schedule plan	15 days from the date of NOA
	Part-A	
2	The OE shall provide the reviewed drawings/documents (approved or commented drawing).	Within 10 working days from the date of submission of drawings/ documents
3	OE shall recommend response to any communication received by SECI from DSI contractor	Within 4 days from the date of receipt
4	Design review meetings shall be conducted.	Every Fortnight
5	All Drawing reviews completion.	8 months from the date of CA
	Part-B	
7	Progress review meeting as per L2 schedule	Every month and as decided by Engineer In-Charge of SECI
8	Representative to be arranged for factory level / plant level pre-dispatch inspection	Within 5 working days from the intimation mail/letter/ any suitable electronic medium.
9	Inspection report submission	Within 3 days from the date of completion of inspection.
10	Submission of Material Receipt Note along with supporting documents	As and when required. Reports shall be reviewed and certified within 3 working days.
11	All site inspection checklist submission	Inspection checklist along with measurement certification shall be reviewed and certified within 3 working days.
12	Recommendation or certification of measurements of work progress	Weekly progress report to SECI. Also, to maintain daily progress register at site. All parties to sign it.
13	Completion of Quality and Safety reports (Environmental and Social safe guards)	Weekly progress report to SECI. Also to maintain daily site incident register at site. All parties to sign it.
14	Site progress review meeting	As required by SECI
15	Expediting Submission of testing and pre-commissioning reports	Depends case to case basis
16	Preparation of punch list	7 days from commercial operation date
6	As-built drawing completion along with full compliance of pending punch point items	2 months from the date of Commissioning.
	Part-C	

S.no	Activities of Project	Time frame
17	O&M review and report	Every month from the date of operational acceptance
	Part - D	
	Submitting Training Plan and conducting trainings	Ongoing activity/ co-terminus and concurrent with project activities

(II) **Duration of OE Service**

The estimated duration of this consultancy/OE services to SECI is for a total period of 30 (Thirty) months which primarily includes the Project commissioning timelines of 18 Months plus 12 months of the first year Project operations. SECI may decide to continue with the services of OE after one year of stabilized operations subject to satisfactory performance and terms and conditions and scope of services to be mutually agreed either through extension of the contract or through a new contract.

OE shall deploy its personnel who shall regulate the project as per the project progress and TOR.

The OE duration of contract shall be completed against one-year completion of operation and maintenance of the Project including submission of all as-built drawings and other reports of the Project by OE. All such drawings and reports shall remain the property of the SECI and shall not be used for any purpose other than that intended under these Terms of Reference. The OE services shall stand completed on acceptance of all the required deliverables of the OE and issue of Completion Certificate by SECI to OE.

5. <u>Key Experts Required:</u>

- *Project Manager*: A relevant degree in engineering with at least 15 years of experience of working in power sector, including 7 years of experience in renewable energy sector as an independent engineer. Preferable to have worked in Indian power sector.
- *Solar Expert*: A relevant degree in engineering with at least 15 years of experience, out of which a minimum of 5 years of experience in solar projects is required and including 7 years as independent engineer
- *Wind Expert*: A relevant degree in engineering with at least 15 years of experience, out of which a minimum of 5 years of experience in wind projects is required and including 7 years as an independent engineer
- *Civil design Expert*: A relevant degree in engineering with at least 15 years of experience, out of which a minimum of 5 years of experience in designing of construction buildings is required.
- *Energy Storage Expert*: A relevant degree in engineering with at least 10 years of experience.
- *Electrical system design Expert including transmission system*: A relevant degree in engineering with at least 15 years of experience, out of which a minimum of 10 years of experience in electrical system design is required.
- *Social and Environment Expert*: At least 5 years of experience of conducting social and environment assessments and implementation. Desirable to have experience in power sector.
- *Procurement/Contract specialist*: At least 15 years' experience in contract management of DSI/goods/works/supply & install procurement in relevant sectors with a strong preference for

experience in large scale solar and wind power projects and preferably with experience also in BESS. Experience with procurement under WB or Multilateral Development Bank financed projects is also an advantage.

- Any other experts required for the fulfillment of the Scope of Work

In addition to the HQ-based teams assisting SECI Corporate Office team with design and other activities as described in Tasks A-C above, the OE shall have a Project Monitoring Team based at the site with at least a 4-member engineering staff comprising of

- 1 electrical engineer cum site in charge,
- 2 civil engineers and
- one mechanical engineer all of whom should be experienced in working in similar sized wind/ solar energy projects.

OE must arrange for their equipment, vehicles and accommodation at site and SECI will make arrangements for OE team to be allowed free and unfettered access to be site and other approvals and permissions as deemed necessary for successful and timely completion of the project activities.

6. Contract & Payment Methodology

It's a Fixed price Lump sum contract, Payment of which shall be firm and on lumpsum basis. The final payment terms will be defined during the RfP stage.