



bidders shall be asked by BHEL (after freezing the scope, technical specifications, and commercial terms & conditions) to submit the impact of such changes on their price bid. A suitable cut-off date and time shall be given to all the techno-commercially acceptable bidders to submit the impact on their price bids. In the event of any bidder, after finalizing the technical specification & scope of supply, opting to revise and submit their latest price bid instead of submitting impact on their price bid asked by BHEL, then their original price (i.e. the previous bid) shall also be opened to know the price impact.

- b. Notwithstanding any other condition/provision in the RFP documents, in case of ambiguity or incomplete documents/clarifications pertaining to qualification and evaluation criteria, BHEL may give the bidders a fixed deadline after bid opening to provide complete & unambiguous documents/clarification, etc. in support of meeting the criteria. In case, the bidder fails to submit any document or submits incomplete documents within the given time, the bid will be rejected.
- c. In case any typing error/other clerical errors is noticed by the bidder, in the tender documents, the same must be pointed out and got clarified before submission of offer, or else, BHEL's interpretation shall prevail & shall be binding on the bidder.

2.23 Checklist

For the proper completion of the RFP, the checklists shall be included with the bid, duly signed by the authorized signatory (Annexure-1).





3 SCOPE OF WORK & DELIVERABLES

3.1 Definitions

The following expressions hereunder and elsewhere, used in this RFP, unless repugnant to the subject or context thereof, shall have the following meanings hereunder respectively assigned to them.

- a. "BHEL" shall mean Bharat Heavy Electricals Limited.
- b. "RFP" means the Request for Proposal being sent by BHEL including all Clarification/ Addendum/ Corrigendum.
- c. "Contract" means the agreement signed between BHEL and the successful bidder.
- d. "Bidder/s" means any entity or person who expresses interest and submits the bid to provide the services to BHEL for works defined in this RFP.
- e. "Successful/selected bidder", 'consulting firm' means any entity finalized to provide the services to BHEL under the contract.
- f. "LOA", "Letter of Award", "WO", "Work Order" refers to order placed on the selected bidder for performing various activities outlined in this RFP.
- g. "Zero date" means the date of Letter of Award (LoA).
- h. "Day" means a day of 24 hours from midnight to midnight irrespective of the number of hours worked on that day.
- i. "Government" means the Government of India unless specified otherwise.
- j. "Bid" means the Technical & Commercial bid and, Price bid.
- k. "Sub-Consultant" means any person or entity with whom the consulting firm subcontracts any part of the services with due permission of BHEL.
- l. "Solar PV value chain" means complete manufacturing chain from quartz mining to solar PV module manufacturing.
Stage 1: Quartz – polysilicon
Stage 2: Polysilicon – ingots/wafers
Stage 3: Ingots/wafers – PV cell
Stage 4: PV Cell – PV Module
- m. "ESDM value chain" means the following manufacturing stages:
Stage 1: Quartz – polysilicon
Stage 2: Polysilicon – ingots/wafers
- n. "Similar work" is defined as "Consultancy engagement (including market research and sectoral assessment, market entry strategy, business modelling and feasibility study) for
 - preparation of Detailed Project Report (DPR) for manufacturing in solar PV value chain or Electronic Systems Design & Manufacturing (ESDM) value chain, either complete or at least in any one of the stages as defined aboveand/or





- diversification of a company into manufacturing in solar PV value chain or manufacturing in ESDM value chain”.
- o. “Associate” means companies under the same parent company – domestic or global

3.2 Corporate overview and the context

BHEL is one of India’s largest engineering and manufacturing enterprises in the energy and infrastructure sectors. With a widespread network of 16 manufacturing plants, 2 repair units, 4 regional offices, 8 service centres, 1 subsidiary, 3 active joint ventures, 15 regional marketing centres, 3 overseas offices and more than 150 project sites across India and abroad, BHEL manufactures a wide range of products, systems & services for the core sectors of the economy viz. power, transmission, transportation, renewables, water, defence & aerospace, oil & gas, and industry.

Experience of over five decades, scale and depth of its operations, a strong manufacturing base, competent manpower, innovation ecosystem, diverse product mix and focus on sustainable business solutions are BHEL’s notable strengths.

BHEL has a dedicated Solar Business Development Group (SBD) at Bengaluru for marketing, engineering, manufacturing and project management in solar segment. BHEL has a portfolio of more than 1.2 GW including ground-mounted, roof-top, canal-top, floating solar etc. BHEL has a cell line of 100 MW capacity and a module line of 226 MW capacity. BHEL also has a dedicated Centre of Excellence (CoE), ASSCP at Gurugram working on indigenous solar PV technology with reduced cost and enhanced efficiency.

Further, to support the AatmaNirbhar Bharat campaign of the government, Solar PV value chain holds substantial indigenization potential especially in upstream. There is no domestic polysilicon and wafer manufacturing capacity and minimal cell and module manufacturing capacity. Against this background, BHEL is exploring opportunities in manufacturing in solar PV value chain.

With this objective, BHEL intends to appoint a consulting firm with a proven track record and requisite competence to prepare a Detailed Project Report (DPR) for the same.

Annual Report 2019-20 of BHEL available at www.bhel.com may be referred to know more about the company including its performance and strategy.

3.3 Scope of work & deliverables

BHEL is exploring opportunities in manufacturing in solar PV value chain to reduce dependence on imports and to support AatmaNirbhar Bharat.





3.3.1 Objective

Identification of (a) opportunities in entering/ expanding/ backward integration solar PV manufacturing value chain and (b) support required to make the opportunities in (a) viable.

This is in line with the company's aspirations of identification and diversification into emerging technology areas for growth & sustainability and simultaneously increasing the share of non-coal business.

The details in the following sections capture the specific requirements of the scope of work. However, these requirements shall not be the limiting factor to meet the objective. The consulting firm will be responsible for all the activities as required and as detailed below:

3.3.2 Scope of work

Preparation of Detailed project report for manufacturing of complete Solar PV value chain (Quartz – polycrystalline – wafer – cell – modules) including the followings:

1. Market research and sectoral assessment

- a. Global and Domestic outlook of the sector/industry from macro and micro perspective, opportunity size, scenario assessment over mid-term (5-7 years) and long term (10-12 years) horizon
- b. Assessment of historical and the projected growth, competition intensity, margin structure, key raw material, demand supply scenario and major sectoral trends [stage-wise]
- c. Value chain assessment, downstream processing requirement and developmental risks Demand and supply market analysis (global and indigenous) for all the products/by-products at all level.
- d. Regulatory, legal, economic and taxation landscape governing the sector and key challenges for BHEL, a public sector enterprise
- e. Assessment of strategic relevance of the sector and potential to leverage BHEL's core competencies, positional advantage and diversification goals

2. Feasibility study, Business modelling and Market entry strategy

- a. Detailed plan of various market entry scenarios, covering greenfield and brownfield approaches to capital investment, acquisition/ joint venture/ partnership route, investment size, revenue model, cost structure; prioritisation if required; [Stage-wise and in combination]
- b. To provide details of the basic resources available in India regarding the complete supply chain with a long term vision.
- c. Business Model with critical success factors
- d. Sources of competitive advantage
- e. Risk identification and mitigation strategy
- f. Technological Infrastructure: Detailed specifications & technology of the equipment/process in all the stages of supply chain, should be inclusive and not limited to quartz to

New Delhi



- MGSi, MGSi to polysilicon chunks, polysilicon to CZ mono wafers, wafers to cells and cells to modules. SWOT analysis of the technology selected over mid-term and long-term.
- g. Operational Infrastructure: Utility requirements including water, power, CDA and inputs on waste water management and area required for the entire operations.
 - h. Details of capital expenditure, cost of capital, payback period, IRR, ROI/ROCE etc. along with sensitivity analysis wrt critical elements.
 - i. Key financial projections for next 10 years, Feasibility study and recommendation of the proposed capital structure and target operating model;
 - j. Establishment of the feasibility of the specific technology to be adopted for implementation working out the comparative analysis of different technologies available for different products i.e. Polysilicon, Ingot/wafer, cell and module. [should be inclusive and not limited to the products mentioned]
 - k. Technology related partnerships/collaborations & likely available partners including partnership for R&D;
 - l. Additional in-house R&D setup, if required including but not limited to equipment with specifications, manpower and their technical expertise (specialization, qualification, experience).
 - m. Suggestions on most suitable location(s) for putting up facility based on BHEL's existing assets, current policies and cost advantages
 - n. Modes for raw material procurement
 - o. Manpower and skill required (training needs)
 - p. Timeline for implementation
 - q. Marketing strategy
 - r. Capability gaps identification and potential modes for capability building.
 - s. To collect and provide data about environmental clearances/compliances. (air, water, land, forest, etc.)

3. Support from the Government

- a. Details of the support required from the government to make the opportunities viable [policy advocacy issues to be identified for support required from the government including agencies /departments of GoI]
- b. Analysis of available GoI schemes which can be looked upon for establishing the facility

3.3.3 Deliverables

Schedule of deliverables

On the basis of preceding sections, the consulting firm is required to deliver the following set of deliverables (in the form of MS Word document, Powerpoint presentations, Excel model and/or other formats as required) as per the timelines mentioned below:

The deliverables given in this section are an outcome of the preceding sections. The consulting firm has to ensure that the deliverables cover the entire scope of work in totality to achieve the overall objective of the exercise. Subsequent additions to deliverables may be made by



BHEL whenever required. While the deliverables are identified week wise, the consulting firm may work concurrently on various activities. The time elapsed mentioned in weeks is indicative and may change as the assignment progresses but while maintaining the total duration of the assignment.

N	Key submissions	Time elapsed ¹ (Week)
	Zero date	T (date)
1	Inception Report Submission of a brief presentation after discussion with BHEL on project methodology, work plan & schedule of sub-activities	T+1 wk
2	Pre-feasibility Report Part 1, 2(f), 2 (j) and 3 (b) of the scope of work defined in 3.3.2	T+4 wk
3	Final Report Submission of two sets of spiral-bound final reports along with soft copies for final acceptance by BHEL and closure of the assignment.	T+8 wk

Other aspects of deliverables

- a. Presentations to the senior team of BHEL will have to be made by the lead partner.
- b. The deliverable shall be treated as completed when accepted by BHEL.
- c. Transfer of Documents: Consulting firm shall transfer all relevant documents/ reports/ presentations/ excel models/ other files related to the above Scope of Work and Deliverables to BHEL during the exercise and finally after the completion of the exercise.
- d. During the delivery of reports/presentation/other documents, BHEL may seek back-up/ supporting data/ working files of given analysis in the deliverables; in such cases, the consulting firm is required to arrange for the sought data (indicating sources thereof) and consider the same as a part of the deliverable.
- e. The recommendations provided by the consulting firm shall be doable in the overall context of BHEL.



¹ Includes expected time taken by BHEL to provide comments on the draft reports and incorporation of necessary amendments by the consulting firm and finalization.



4 EVALUATION OF BIDS

4.1 Pre-Qualification criteria

The bidder must meet all of the following pre-qualification criteria:

a) Annual Turnover

The bidder should have at least an average annual turnover of ₹30 lakhs from consulting works during the last three years, 2017-18, 2018-19 & 2019-20. In case, the bidder is following calendar year as their accounting year, the equivalent period for considering annual turnover is 2017, 2018 & 2019.

Documents to submit: Audited Balance Sheet and Profit & Loss Account indicating annual turnover from consulting works duly certified by the authorized signatory or; Certificate from statutory auditors indicating the annual turnover of the bidders.

b) Experience of the consulting firm

The bidder must have undertaken similar works², directly or through parent/ subsidiaries/ associates (companies under the same parent company) during the last seven years up to 28th February, 2021:

- i. Three completed similar works with the order value of not less than ₹40 lakhs or equivalent in other currencies *each* (excluding GST/taxes); or
- ii. Two completed similar works with the order value of not less than ₹50 lakhs or equivalent in other currencies *each* (excluding GST/taxes); or
- iii. One completed similar work with the order value of not less ₹80 lakhs or equivalent in other currencies (excluding GST/taxes)

Documents to submit: Copy of award of work and documentary evidence in support of the successful completion of a consulting assignment (Annexure-8), Letter of comfort (Annexure-17) along with documentary evidence establishing the relationship between parent/ subsidiaries/ associates in case experience of parent/ subsidiaries/ associates is used.

c) Experience of Key Personnel

Bidder shall provide a list of team members who will be driving this project till completion of the contract. The team, mandatorily constituting full-time employees shall include minimum, i) One Lead Partner/ Director/ equivalent, who will be designated as Team Leader; ii) One Project Manager (full time); iii) One Specialist - Solar (full time).

² For 'similar works', here and elsewhere, refer definition under Section-3





Minimum experience required of the team is as under:

Partners/ Director/ equivalent	Minimum 15 (fifteen) years of consulting experience including 7 (seven) years in the Solar sector.
Project Manager	Minimum 7 (seven) years including 2 (two) years in the Solar sector
Specialist – Solar	Engineer with Master's Degree or MBA or equivalent / Masters' in Science from reputed institute, with at least 8 years of experience on the date of submission of bid with policy, regulatory, strategy/ policy formulation experience in the Solar sector.

CVs of all the Team Members proposed to be deployed for this project as per Annexure-9, duly certified by CEO/Country Head to be attached. However, consulting firm may deploy more resources as per the requirement of the project.

No relaxation shall be accepted with regards to pre-qualification criteria. Only the bidders meeting the above criteria shall be evaluated further viz. techno-commercial and price bid.

4.2 Evaluation of Techno-commercial bid

4.2.1 Techno-commercial evaluation Criteria

The Techno-Commercial bid of the bidders meeting the pre-qualification criteria shall be evaluated as per the Quality & Cost Based Selection (QCBS) system which will include 70% weighted score for quality (techno-commercial bid) and 30% weighted score for the price (price bid).

N	Criteria	Max marks	Scale/ scheme of marking
A	Average annual turnover of the bidder from consulting works during last three years (FY18, FY19, FY20/ 2018-2020)	5	100 Cr and above – 5 <75-100 Cr – 4 <50-75 Cr – 3 <25-50 Cr – 2 0.3 Cr-25 Cr – 1 mark
B	Experience of the bidder during the last seven years (2013-20 to 2019-20/ 2014-2020) (max marks: 25)		
i.	No of similar works undertaken, each having a value equivalent to at least ₹50 lakhs (Annexure-10)	10	Two marks for each project subject to maximum of 10 marks
ii.	No of similar works undertaken with respect to stages of the value chain, (Annexure-11)	15	>1 project in entire value chain – 15 marks





			<p>1 project in entire value chain – 14 marks</p> <p>>1 Project in 3 stages including stage 1 and 2 – 13 marks</p> <p>1 Project in 3 stages including stage 1 and 2 – 12 marks</p> <p>>1 Project in stage 1 and 2 – 11 marks</p> <p>1 Project in stage 1 and 2 – 10 marks</p> <p>>1 Project in stage 1 or 2 – 9 marks</p> <p>1 Project in stage 1 or 2 – 8 marks</p> <p>>2 in Stage 3 & 4 – 7 marks</p> <p>2 in Stage 3 & 4 – 6 marks</p> <p>1 in Stage 3 & 4 – 5 marks</p> <p>>2 in Stage 3 or 4 – 4 marks</p> <p>2 in Stage 3 or 4 – 3 marks</p> <p>1 in Stage 3 or 4 – 2 marks</p>
C	Experience of the team deployed during the last seven years (2013-14 to 2019-20/2014-2020) (max marks: 30):		
i.	Number of similar works undertaken by lead partner/ partners, each assignment having a value of at least ₹50 lakhs (India)/ or equivalent (global) (Annexure-12)	10	Two marks for each project subject to maximum of 10 marks
ii.	Number of similar works undertaken by proposed project manager, each assignment having a value equivalent to at least ₹50 lakhs (Annexure-13)	10	Two marks for each project subject to maximum of 10 marks
iii.	Number of similar works undertaken by proposed specialist – solar among Indian/ global companies, each assignment having a value equivalent to at least ₹50 lakhs (Annexure-14)	10	Two marks for each project subject to maximum of 10 marks
D	Business presentation – (max marks: 40)		
i.	Demonstration of the understanding of the following:	20	D (i) to (ii) Shall be assessed based on Presentation (Soft





	<ol style="list-style-type: none"> 1. Global and Domestic outlook of the sector/industry from macro and micro perspective including technology requirements relative to solar PV value chain 2. Understanding BHEL's context, challenges, aspirations, and strengths 		copy and a signed hard-copy of the presentation needs to be submitted after the presentation)
ii.	<p>Approach for preparing DPR:</p> <ol style="list-style-type: none"> 1. Availability of Strategic tools/ models, research database, and application of the same in other previous similar engagements 2. Robustness of overall approach and methodology for carrying out the exercise to meet objectives and timeline of deliverables, with broad break up of activities, & specific requirements from BHEL against each activity. 3. Success stories along with impact created on the ground through similar engagements in past 4. Credentials of the team and specialist to be deployed for the project 	20	
	Total	100	-

- i. The scope of the work is indivisible and shall be awarded to a single successful bidder. Consortium bidding is not allowed. However, in case, the consulting firm requires the support of another consultant/ agency, for undertaking part of work, viz. market research, etc., the same would be acceptable with prior approval of BHEL based on merit of that consultant/ agency. However, performance and cost of the subject assignment will be the sole responsibility of the consulting firm submitting the bid.
- ii. The bidder scoring the highest technical score (T_H) will be given a technical score out of 100 points. The technical scores (S_T) of other proposals will be computed as follows:

$$S_T = 100 \times T / T_H$$

(T = Marks scored in the respective Technical bid)

- iii. The bidders with scores (S_T) of equal to or more than seventy (70) out of one hundred (100) will be considered for further evaluation including the opening of price-bids and shall be ranked from highest to the lowest on the basis of their technical score.

