BHARAT HEAVY ELECTRICALS LIMITED

(A Government of India Undertaking)

Delhi – 110 049

India

BHEL seeks Expression of Interest (EoI)

for

Business Sharing Agreement (BSA)/ Strategic Tie-up

for

Hydrogen Electrolyser System

EoI Ref No.: BHEL/AA/TL/2403

Date: 17.07.2024

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SECTION-1
DISCLAIMER

The information contained in this Expression of Interest (EoI) document provided to the OEM(s), by or on behalf of Bharat Heavy Electricals Limited (BHEL) or any of its employees or advisors, is provided to the OEM on the terms and conditions set out in this EoI document and all other terms and conditions subject to which such information is provided.

1. The purpose of this EoI document is to provide the OEM with information to assist the formulation of their proposal. This EoI document does not purport to contain all the information each OEM may require. This EoI document may not be appropriate for all persons, and it is not possible for BHEL, its employees or advisors to consider the business/investment objectives, financial situation and particular needs of each OEM who reads or uses this EoI document. Each OEM should conduct his own investigations and analysis and should check the accuracy, reliability and completeness of the information in this EoI document and where necessary obtain independent advice from appropriate sources.
2. BHEL, its employees and advisors make no representation or warranty and shall incur no liability under any law, statute, rules or regulations as to the accuracy, reliability or completeness of the EoI document.
3. BHEL may, in its absolute discretion, but without being under any obligation to do so, modify, amend or supplement the information in this EoI document.
4. The issue of this EoI does not imply that BHEL is bound to select and shortlist any or all the OEM(s). Even after selection of suitable OEM BHEL is not bound to proceed ahead with the OEM and in no case be responsible or liable for any commercial and consequential liabilities in any manner whatsoever.
5. The OEM shall bear all costs associated with the preparation, business/technical discussions/presentation and submission of response against this EoI. BHEL shall in no case be responsible or liable for these costs regardless of the conduct or outcome of the EoI process.
6. Canvassing in any form by the OEM or by any other agency on their behalf shall lead to disqualification of their EoI.
7. Notwithstanding anything contained in this EoI, BHEL reserves the right to accept or reject any application and to annul the EoI process and reject all applications, at any time without any liability or any obligation for such acceptance, rejection or annulment and without assigning any reasons, thereof. In the event that BHEL rejects or annuls all the applications, it may at its discretion, invite all eligible OEM(s) to submit fresh applications.
8. BHEL reserves the right to disqualify any applicant during or after completion of EoI process, if it is found there was a material misrepresentation by any such applicant or the applicant fails to provide within the specified time, supplemental information sought by BHEL.
9. BHEL reserves the right to verify all statements, information and documents submitted by the applicant in response to the EoI. Any such verification or lack of such verification by BHEL shall not relieve the applicant of his obligations or liabilities hereunder nor will it affect any rights of BHEL.

SECTION-2

SCHEDULE OF EoI PROCESS & CONTACT DETAILS

A. SCHEDULE OF EoI PROCESS

The schedule of activities during the EoI Process shall be as follows -

S No.	Description	Date
1	**Issue of EoI document**	**17.07.2024**
2	**Last date of submission of EoI**	**16.08.2024**

B. CONTACT DETAILS:

Additional General Manager (CTM)
Corporate Technology Management,
Bharat Heavy Electricals Limited (BHEL),
BHEL House, Siri Fort, New Delhi 110049
Tel: +91-11- 6633- 7377/7323/7220
Mobile: +91 9958181792
E-Mail: techeoi@bhel.in

SECTION – 3

DETAILS OF EXPRESSION OF INTEREST (EoI)

3.1 INTRODUCTION:

BHEL seeks Expression of Interest from Original Equipment Manufacturers (OEMs) of Hydrogen Electrolyser System who are meeting the requirements of this EoI and are willing to be associated with BHEL through a Business Sharing Agreement (BSA)/ Strategic Tie-up.

Here,

OEM means a manufacturer of Electrolyser Stack and a system integrator of Stack with necessary Balance of Plants.

Electrolyser system means Electrolyser stack along with its necessary BOPs required for generation of fuel cell grade hydrogen from De-ionized water, such as, Stack power system, Water management system, Hydrogen processing system, Cooling system, and Control system etc.

3.2 ABOUT BHEL:

BHEL is a leading state-owned company, wherein Government of India is holding 63.17% of its equity. BHEL is an integrated power plant equipment manufacturer and one of the largest engineering and manufacturing enterprise in India, catering to the core infrastructure sectors of Indian economy viz. energy, transportation, and heavy engineering industry, defence, renewable and non-conventional energy. The energy sector covers generation, transmission and distribution of equipment for thermal, gas, hydro, nuclear and solar photo voltaic power plant. BHEL has been in this business for more than 50 years and BHEL supplied equipment account for approx. 200 GW of the total thermal generating capacity in India. BHEL is also listed in Indian stock exchanges. BHEL has 16 manufacturing units, 4 power sector regions, 8 service centres and 15 regional offices besides host of project sites spread all over India and abroad. BHEL has its footprint in all the inhabited continents with references in 90 countries including Malaysia, Oman, Iraq, Syria Sudan, Libya, Cyprus, Malta, Afghanistan, Bangladesh, Bhutan, New Zealand etc. The cumulative overseas installed capacity of BHEL manufactured power plants nearing 10,000 MW. The annual turnover of BHEL for the year 2023-24 was around US$ 2.9 Billion*. BHEL's highly skilled and committed manpower of approx. 28500; state-of-the-art manufacturing, R&D facilities and latest technologies helped BHEL to deliver a consistent track record of performance since long. To position leading state-owned companies as Global Industrial giant and as a recognition for their exemplary performance, Government of India categorized BHEL as "Maharatna Company" in 2013.

The high level of quality & reliability of BHEL products is due to adherence to international standards by acquiring and adapting some of the best technologies from leading companies in the world, together with technologies developed in its own R&D centres.

Our ongoing major technology tie-ups include agreements with Siemens Energy Global GmbH & Co. KG., Germany (for Steam Turbines, Generators and Condensers); Mitsubishi Heavy Industries Ltd., Japan (for Flue Gas Desulfurization Systems); Leonardo S.p.A, Italy (for Super Rapid Gun Mount); GE Technology GmbH, Switzerland (for Steam Turbine for

[*Note: Currency conversion rate considered: 1 US $=Rs. 83.38 as on 31st March 2024]

Nuclear Power Plant and for Gas turbines); Indian Space Research Organization (ISRO) (for Space Grade Lithium-Ion Cells); CSIR-IIP (PVSA based Medical Oxygen Plant); NANO Company Ltd., Korea (for SCR Catalysts); HLB Power Company Ltd., Korea (for Gates and Dampers); Kawasaki Heavy Industries Ltd., Japan (for Stainless Steel Coaches for Metros); Valmet Automation Oy, Finland (for DCS System); Babcock Power Environmental Inc., USA (for Selective Catalytic Reduction Systems); Sumitomo SHI FW Energia Oy., Finland (for Circulating Fluidized Bed Combustion Boilers); HIMA Middle East FZE and Dubai (for KAVACH System/Train Collision Avoidance System).

*** More details about the entire range of BHEL's products and operations can be viewed by visiting our web site www.bhel.com.**

3.3 SCOPE OF COOPERATION:

BHEL is seeking Expression of Interest (EoI) for a Business Sharing Agreement (BSA)/ Strategic Tie-up from OEM(s) having latest and proven technology of Hydrogen Electrolyser System including stack and BoP along with system integration as per indicative scope of business sharing/ strategic tie-up.

BHEL shall receive applications pursuant to this EoI in accordance with the terms set forth herein, as modified, altered, amended and clarified from time to time by BHEL, and all applications shall be submitted in accordance with such terms on or before the date specified in this EoI for submission of applications.

Upon receipt of responses against this EoI, BHEL will review the responses to ascertain suitability of the offer and shortlist OEM (s) for further discussions. Detailed discussions on commercial and other terms and conditions to finalize the BSA/Strategic tie-up shall be held with shortlisted OEM (s). The detailed terms & conditions and work scope for such an agreement shall be mutually agreed upon. BHEL intends to shortlist OEM (s), who shall collaborate with BHEL on a phase wise approach, with responsibility of supplying components and providing technology support to BHEL for Electrolyser System. In the initial phase of collaboration, OEM shall supply their manufactured stacks to BHEL and provide technology support for system engineering, BoP engineering, E&C Supervision, Testing/ QA etc. In subsequent phases, scope of sharing/collaboration/ tie-up could be further enhanced to enable BHEL to further indigenise Electrolyser system. The time-span of the above phases may be as mutually agreed during detailed discussions on terms & conditions and work scope of the Business Sharing Agreement (BSA)/ Strategic Tie-up.

3.4 PREQUALIFICATION REQUIREMENTS (PQRs):

3.4.1 OEM shall be a manufacturer of Hydrogen Electrolyser system and should have at least 2 (two) years of experience of designing, engineering, manufacturing, assembling, testing, supply, installation and commissioning of Electrolyser System, as on the closing date of this EoI.

AND

3.4.2 OEM must have done system integration and supplied an Electrolyser system based on Electrolyser stacks (manufactured by the OEM) with a capacity of at least 500 kW per stack within the last 7 years. Additionally, the system should be in successful operation for at least 06 months from closing date of this EoI.

AND

3.4.3 Specific energy consumption of the OEM's Electrolyser stack (of at least 500 kW capacity) (DC side at 100% rated capacity) shall be equal to or less than 50kWh/kg H2.

3.5 RESTRICTIONS ON SPECIFIED TRANSFER OF TECHNOLOGY WITH AN ENTITY FROM A COUNTRY WHICH SHARES A LAND BORDER WITH INDIA:

3.5.1 OEM (s) from a country which shares a land border with India will be eligible to respond to this EoI only if OEM(s) is registered with Competent Authority (Registration Committee constituted by the Department of Promotion of Internal Trade (DPIIT) of Govt. of India). Such registration should be at least valid for the entire period of EoI due date or any extension thereof.

3.5.2 OEM (s) from a country which shares a land border with India means: a) An entity incorporated, established or registered in such country; or b) A subsidiary of an entity incorporated, established or registered in such country; or c) An entity substantially controlled through entities incorporated, established or registered in such country; or d) An entity whose beneficial owner is situated in such a country; or e) An Indian (or other) agent of such an entity; or f) A natural person who is a citizen of such a country; or g) A consortium or joint venture where any member of the consortium or joint venture falls under any of the above.

3.6 INSTRUCTIONS

3.6.1 The interested OEM (s) shall ensure that their duly filled complete response along with following annexures are received by BHEL on or before the last date of EoI.

Annexure 1- Details required from OEM
Annexure 2- Information on various parameters of Electrolyser System
Annexure 3- Documents to be furnished by OEM

3.6.2 The response to EoI shall also be accompanied with details on **company background, technical features/ product catalogue, reference list of customers, details of current manufacturing facilities and relevant certificates, annual audited financial reports for last three (3) years**.

3.6.3 **Language:** All correspondences and documents related to the EoI response shall be in English language, provided that any printed literature furnished by the OEM may be written in another language, as long as such literature is accompanied by a translation of its pertinent passages in English language in which case, for purposes of interpretation of the bid, the English translation shall govern.

3.6.4 The OEM (s) shall abide by the terms & conditions, as applicable, of the EoI.

3.6.5 All pages of the response against this EoI shall be duly signed by the authorised signatory.

3.6.6 Multiple proposals from the same OEM should not be submitted.

3.6.7 BHEL at its discretion shall inspect the OEM's works/office/reference site premises for the purpose of evaluation, as deemed necessary before selection of Partner. BHEL's decision in this regard shall be final.

3.6.8 Any OEM which has been debarred/blacklisted by Indian Central/State Governments or by any entity controlled by Indian Central/State Governments from participating in any of their project, as on date of submission of EoI, shall not be eligible to submit the EoI.

3.6.9 BHEL shall receive applications pursuant to this EoI in accordance with the terms set forth herein, as modified, altered, amended and clarified from time to time by BHEL, and all applications shall be submitted in accordance with such terms on or before the date specified in this EoI for submission of applications.

In case any amendment/corrigendum to this EoI is issued, it shall be notified only at www.bhel.com

3.7 CONFIDENTIALITY:

Information relating to the examination, clarification, evaluation and comparison of EoI and recommendations shall not be disclosed to OEM. Any effort by OEM to influence BHEL in processing of EoI or selection decisions may result in the rejection of the response against EoI.

3.8 GOVERNING LAWS & JURISDICTION:

The EoI process shall be governed by, and construed in accordance with the laws of India and the Courts at New Delhi (India) shall have exclusive jurisdiction over all disputes arising under, pursuant to and / or in connection with the EoI process.

Annexure-1

Details sought from OEM

S. No.	Requirement	OEM's response (YES/NO) and remarks if any
1.	Whether the Original Equipment Manufacturer (OEM) is manufacturer of Stack	
2.	For how many years, OEM is in business of Electrolyser System	
3.	Whether the OEM has capability of engineering and product development of Electrolyser System	
4.	Whether the Company background and its product profile/ catalogues along with technical details of Electrolyser System, which is being offered to BHEL under this EoI, enclosed	
5.	Whether product data sheet has been enclosed	
6.	Whether information on competitors/market share has been enclosed	
7.	Whether OEM's detailed reference list (including performance certificates, satisfactory operation certificates etc.) have been enclosed	
8.	Whether OEM's annual audited financial reports including auditor's report for last 3 years have been enclosed	
9.	Whether the OEM owns the Intellectual Property Rights for the technology support to be provided under the Business Sharing Agreement (BSA)/ Strategic Tie-up. If yes, whether list of such Intellectual Property Rights enclosed.	
10.	Whether the OEM has any experience in establishing new manufacturing, testing and assembly facilities, if so please specify.	
11.	Whether OEM has any technology tie-up/ Strategic Tie-up/ business collaboration with any other entity in the world for Electrolyser System. If so, please specify.	
12.	Whether the OEM is a manufacturer of Hydrogen Electrolyser system and has at least 2 (two) years of experience of designing, engineering, manufacturing, assembling, testing, supply, installation and commissioning of Electrolyser System, as on the closing date of this EoI.	

13.	Whether the OEM has done system integration and supplied an Electrolyser system based on Electrolyser stacks (manufactured by the OEM) with a capacity of at least 500 kW per stack within the last 7 years. Additionally, has the system supplied is in successful operation for at least 06 months from closing date of this EoI.	
14.	Whether Specific energy consumption of the OEM's Electrolyser stack (of at least 500 kW capacity) (DC side at 100% rated capacity) is equal to or less than 50kWh/kg H2.	
15.	Whether the Electrolyser System being proposed for business sharing/ strategic tie-up to BHEL is approved for all necessary certifications (to be substantiated with necessary certificates)	
16.	Details about the total Strength of Engineering/ Technical/ R&D Personnel	
17.	Whether the OEM has any presence in India. If so, please specify.	

(SIGNATURE)

Annexure -2

Information on Various Parameters of Electrolyser System

S. No.	Specifications / Parameters	OEM's response (YES/NO) and remarks if any
1.	Annual Manufacturing capacity of Stack/System	
2.	Whether the Membrane Electrode Assemblies (MEAs) / Core Cells (consists of electrodes and ionic conductive separator) are manufactured in-house or bought out	
3.	Whether the Bipolar plates are manufactured in-house or bought-out	
4.	Whether the OEM has in-house capability for all sub-components (Porous transport layers, end plates, sealings etc.) of stack	
5.	Whether the OEM has in-house capability for all other sub-systems (Power supply system, Water management system, Hydrogen processing system, Cooling system, and Control system etc.)	
6.	Minimum and maximum rating of Electrolyser system (range in Nm^3/hr)	
7.	Operating temperature range (^oC)	
8.	Outlet pressure of H_2 (in Bar)	
9.	Hydrogen purity in %	
10.	Specific energy consumption incl. auxiliary units (BOL and EOL in kWh/Nm^3 H_2)	
11.	Certification and compliances of Electrolyser plant	
12.	Water required per kg of H_2 generated	
13.	Control range (% of nominal power)	
14.	Time taken for Cold start to nominal power in minutes	
15.	Time taken for Standby start to nominal power in sec.	
16.	Designed life of Stack in hours	
17.	Designed life of Electrolyser System in years	

18.	Number of Electrolyser stack and system supplied (numbers with capacity) in last three years	
19.	Cumulative Operational hours of Stack and Electrolyser systems supplied by the OEM in last three years	
20.	Minimum operational durability of Electrolyser stacks and systems with degradation rate	
21.	Nominal current density (A/cm^2)	
22.	Voltage range (Volts)	
23.	Voltage efficiency (LHV in %)	

(SIGNATURE)

Annexure: 3

Documents to be furnished by OEM

Sl. no	PQR Clause	Supporting documents to be submitted
1	Clause 3.4.1	- Certificate of Incorporation & CEO certification for supply reference
2	Clause 3.4.2	- PO/LOI/ LOA/ WO copy of System Integration and supply of an Electrolyser system based on Electrolyser stacks (manufactured by the OEM) with a capacity of at least 500 kW per stack within the last 7 years - Certificate from end user for successful operation of 6 months
3	Clause 3.4.3	- Valid Performance/ Test Certificate in English; in case the certificate is in any other language, valid English translation copy shall necessarily be furnished. **Or** - Any other document (to the satisfaction of BHEL) establishing the claimed specific energy consumption

(SIGNATURE)