INVITATION
FOR
EXPRESSION OF INTEREST (EOI)

FOR SETTING UP
5 & 10 MW ELECTROLYZER BASED
GREEN HYDROGEN PROJECT
ALONG WITH ASSOCIATED FACILITIES

EOI No. : GIPCL/GH2/04/2022
Date : 11th April, 2022

Last Date of Submission : 30th April, 2022

GUJARAT INDUSTRIES POWER COMPANY LTD.

P.O. Ranoli, Dist.- Vadodara, PIN – 391350.
Gujarat, India

Phone:+91-265-2234341,2234343
Email: snpurohit@gipcl.com

Website: www.gipcl.com

NOTICE OF EXPRESSION OF INTEREST (EOI) Dated: 11th April, 2022

REF : EOI No. - GIPCL/GH2/04/2022

Subject: Invitation for Expression of Interest (EOI) for setting up 5 & 10 mw Electrolyzer based Green Hydrogen Project along with associated facilities.

Gujarat Industries Power Company Limited invites EOIs from the interested parties for setting up 5 & 10 mw Electrolyzer based Green Hydrogen Project along with associated facilities.

Sr. No.	Item	Description
1	Subject of EOI	Setting up of 5 & 10 MW Electrolyzer based Green Hydrogen Project along with associated facilities.
2	Preferable Location	Vadodara or any other suitable location in the state of Gujarat
3	Availability of EOI	On GIPCL's Website i.e. www.gipcl.com, from 11th April, 2022
4	Tender (EOI) FEES / EMD	Not Applicable
5	Last date & time of Submission of EOI	30th April,2022 by 17:00 hrs. (IST)
6	Date of Opening of EOI	2nd May,2022
7	Place of submission of EOI	Physical Copy shall be sent to: Shri. S N Purohit, CGM (RE &BO) Gujarat Industries Power Company Limited (GIPCL), P. O. Ranoli, Dist.-Vadodara. PIN- 391350 Gujarat, India
8	Mode of submission of EOI documents	-Soft Copy through Email to: snpurohit@gipcl.com -Physical copy may be submitted by hand delivery or through post/courier at above address so as to reach on or before the due date & time.

Complete EOI document is available and can be downloaded from the company website www.gipcl.com.

GIPCL shall not be liable for any postal delays what so ever in receipt of EOI documents and EOI received after the stipulated date and time shall not be entertained. EOIs submitted without supporting document will summarily rejected.

Mr. S N Purohit,
Chief General Manager (RE & BO),
Gujarat Industries Power Company Limited (GIPCL),
P. O. Ranoli, Dist.-Vadodara. PIN- 391350
Gujarat, India

Email: snpurohit@gipcl.com

1.0 Introduction about GIPCL

Gujarat Industries Power Company Limited (GIPCL) was incorporated in 1985 as a Public Limited company under the auspices of Government of Gujarat (GoG). The Company was incorporated as a Public Limited Company with the Registrar of Companies, Gujarat under the Companies Act, 1956 and having its registered office at P.O. Ranoli, Vadodara- 391 350, Gujarat, India and has listed its shares on BSE Limited and The National Stock Exchange (India) Limited. The company has been promoted by leading Gujarat PSUs, namely GSFC, GACL and GUVNL. The company is engaged in the business of Electrical Power Generation with a present installed generation capacity of 1184.4 MW. The Company has a diversified portfolio of Thermal (Gas and Lignite), Wind and Solar Power Plant Assets in the state of Gujarat. GIPCL aims to transform itself into a formidable national level power sector enterprise.

Company's Operational Projects

1. 310 MW Gas Based Combined Cycle Power Plant at Baroda
2. 500 MW Lignite Based Power Plant with Captive Mines , Nani Naroli, at Taluka: Mangrol, Surat District
3. 374.4 MW Renewable Energy comprising of Utility Scale Wind & Solar Projects

GIPCL have vast experience and proven track record of over 25 years in Power Project implementation, operation and maintenance. It is one of the fastest growing state-owned companies and has excellent support of Government of Gujarat.

For detailed profile of company and past financial results, Applicants may visit our website: www.gipcl.com.

2.0 Intent of Expression of Interest

GIPCL have large portfolio of renewable generation with existing RE capacity of 374.4 W in operation. GIPCL is in the process to expand its RE capacity up to 2000+ MW in the state of Gujarat. With emergence of Green Hydrogen as a clean fuel of future and the thrust provided by Government of Gujarat and Government of India, GIPCL intends to venture in the field of Green Hydrogen business using its strength in RE generation.

In view of above, GIPCL intends to set up a Green Hydrogen Project of either 5 MW or 10 MW Water Electrolyzer, working on Electrolysis of Water. The proposed plant may be located at Vadodara or any other suitable site in Gujarat.

The required Renewable Energy for the operation of Electrolyzer based Hydrogen Generation Plant will be supplied by GIPCL at Battery limit of Hydrogen Generation Plant from its own plant and at its own cost.

The Hydrogen generated from this plant shall be supplied to surrounding fertilizers / refineries / chemical industries. This will also help these industries to meet the future Green Hydrogen Consumption Obligation (GHCO) expected from Government of India

Purpose of the present EOI is :

- To evaluate and select best suitable technology for green hydrogen generation.
- To identify / shortlist the potential suppliers of technology.
- To frame up technical specifications and Pre-qualification Requirement for the final Tender.

GIPCL reserves the right to implement the project through Request for Proposal (RfP) process amongst the shortlisted parties identified through this EoI Process or through a separate tender.

3.0 Required Quality & Pressure of Green Hydrogen

The Green Hydrogen produced from Electrolyzer shall be mixed with Grey Hydrogen network.

Hydrogen Quality Parameters

S. No.	Description	Value
1.	Electrolyzer Technology	Applicant to specify
2.	Electrolyzer Capacity	5 MW and 10 MW
3.	Hydrogen pressure	Minimum 30 BAR(g)
4.	Temperature of Hydrogen	$35^{O}C$ to $40^{O}C$
5.	Hydrogen Purity	Minimum 99.997 % by Volume
6.	Moisture in Hydrogen	< 2 PPMV
7.	Oxygen content in Hydrogen	< 1 PPMV
8.	Electrolyte carry over in Hydrogen (If applicable)	0

4.0 Plant input Parameters :

S. No.	Description	Value
1	Power	Required RE Power will be supplied by GIPCL at Green Hydrogen project site. Applicant shall specify required power for operation of Hydrogen Generation Plant and voltage level.

2	Quality of Input Water (Demineralized Water) for Hydrogen Production	pH value: 5.5-7.0 Conductivity :1.0 – 3.0 µS/cm Total Dissolved Solids : Below Detectable Limit Silica : < 50 ppb Chloride : Below Detectable Limit Sulphate : Below Detectable Limit Calcium : Below Detectable Limit Magnesium : Below Detectable Limit Nitrite : Below Detectable Limit Total Hardness : Below Detectable Limit
3	Raw / Cooling Water	pH :7-8 Turbidity : <20 NTU Conductivity :600-1800 uS/cm Chlorides: 300 ppm (max) Total Hardness : 200 to 400 TDS : 200 to 400 Inlet Temperature : 35^{O}C to 37^{O}C

Note: In case parameters of DM Water indicated above needs change/improvement, applicant shall consider appropriate treatment for the same to make it suitable for the offered Electrolyzer system.

5.0 Broad Scope of Work

The responsibility of the Applicant under this Project shall include but not limited to following:

a) Design, Engineering and supply of the Electrolyzer system along with all the related auxiliaries as a single point responsibility.

b) Erection & commissioning of entire system along with all auxiliaries.

c) To demonstrate Guarantee Test Run.

d) To meet the performance guarantee of the system, like specific power (KW/kg of H2) and water consumption (i.e. Kg water/Kg of H2).

e) DM Water treatment, if required.

f) To meet the quality of Green Hydrogen purity.

g) Interconnection of Green Hydrogen with existing Grey Hydrogen network. (Details of interconnection shall be given during final tendering.)

h) Comprehensive Operation & Maintenance of the System for predefined period after successful commissioning and Guarantee Test Run.

i) Clearance from statutory bodies for setting up Electrolyzer based Hydrogen Plan.

j) Training of GIPCL's Personnel.

6.0 GIPCL's Responsibilities :

a) GIPCL shall provide adequate land required for installation of Electrolyzer based Hydrogen Plant.

b) GIPCL will provide RE power at single point near proposed Plant at required voltage level (Applicant to Indicate voltage level).

c) Required DM Water, Raw / Cooling water at single point.

d) Instrument air / Service air at single point.

e) Further necessary distribution of electric power, DM water, Raw/Cooling Water, Instrument / Service air shall be in the scope of Applicant.

7.0 Information required from Applicant as a part of EOI

(A) Technical information:

a) Brief write up of Electrolyzer technology selected for Hydrogen production including basic principle, major operating conditions/parameters, quality of Hydrogen produced etc.

b) Merits and demerits of offered technology as compared with other Electrolyzer technologies available in the market.

c) Reference list of green Hydrogen plants presently running on offered Electrolyzer technology.

d) Module Size, module efficiency and hydrogen generation per module.

e) Electrolyzer life in Hrs. of operation. (Based on 24 X 7 operation).

f) Electrolyte type and its make up quantity as per applicable technology.

g) Turn down ratio.

h) Ramp up / Ramp down capabilities of Hydrogen plant.

i) Brief about the auxiliary system.

j) Execution Period from award of job till Commissioning and Guarantee Test Run.

k) Quality of Green Hydrogen produced, along with impurity level.

l) Quality and quantity of Oxygen produced.(if applicable)

m) Pressure and temperature at which Green Hydrogen / Oxygen shall be produced.

n) Power & DM water required, per kg of Hydrogen production.

o) Plot size required for the project.

p) Utilities required for normal operation of the plant.

q) Effluent generation, if any.

r) Guarantee / Warranty offered for the Electrolyzer / project

s) Previous experience, in implementing Electrolyzer based green hydrogen production projects.

t) Engineering strength of Applicant for execution of the project.

u) Any other technical detail which Applicant would like to highlight, about its technology for consideration of EOI.

Applicant is requested to provide the technical data as per format given in **Annexure-1.**

(B) Budgetary Cost :

I. Estimated total capital investment for the project of 5 MW and 10 MW separately with cost breakup of all major components preferably as listed below :

a) Electrolyzer

b) Hydrogen Purifier (if required)

c) Blending equipment

d) Control System

e) Water Purifier (if required)

f) Installation and Commissioning

g) Miscellaneous Items

Applicant shall separately mention taxes, duties, freight, insurance applicable for above items/project.

II. Estimated Operation & Maintenance cost for 5 years with spares and consumables.

(C) Project Timeline :

Applicant shall mention project completion period from award of job till Commissioning and Guarantee Test Run with necessary details.

(D) Applicant's Organizational details:

1. Name of the **Company/**Lead Partner of Consortium/**Affiliates:
   (**strike off whichever is not applicable)
2. Legal status of the Company/Consortium/Affiliates:
3. Brief description of the Company/Consortium/Affiliates including details of its businessgroups/subsidiaries
4. Date of Incorporation:
5. Date of Commencement of business:
6. Full address including Telephone nos, website etc.
   a. Registered Office:
   b. Head Office:
   c. Address for communication:
   d. Contact Details:
   e. Office Address in India, if any:

(E) Financial Turnover:

Applicant is requested to submit Annual financial turnover during the last three (3) preceding financial year i.e. 2020-21, 2019-20, 2018-19. Applicant to submit audited Balance Sheet and Profit & Loss account for the above three financial years.

(F) Declaration:

Applicant is requested to provide declaration stating that their firm is neither put on Holiday or Black-listed by any Government / PSU / Private firm or Financial Institution. Applicant is requested to provide Self Declaration on Applicant's Letter Head.

(G) Validity:

Applicant is requested to mention validity of the proposal submitted.

(H) Miscellaneous:

a) GIPCL reserves the right to cross check for any details as furnished by the Applicant.

b) The Applicant shall bear all costs associated with the preparation or delivery of documents including costs and expenses related with visits to the Site. GIPCL will in no case be responsible or liable for those costs and expenses regardless of the outcome of the EOI process

c) All technical information shared to Applicant will be considered as confidential. Applicants will not use for any other purpose or disclose confidential information to any third party without prior written approval of GIPCL.

d) GIPCL reserves the right to accept or reject any EOI and to annul the process at any time without thereby incurring any liability to the affected Applicant(s) or any obligation to inform the affected Applicant(s) of the grounds for GIPCLs action.

8.0 Submission of EOI

Applicant is requested to submit the EOI along with the required information / documents as mentioned in Clause No. 7 (Technical, Budgetary Cost and Financial) of this EOI in Soft copy as well as Hard Copy on or before **30th April, 2022, latest by 17:00 hrs (IST)**. For better understanding & clarification, physical / virtual meeting can be arranged at suitable time and date.

All signatures in EOI shall be dated and shall bear a seal of the Applicant. Applicant may send EOI documents to below mentioned address.

Mr. S. N. Purohit
Chief General Manager (RE & BO)
Gujarat Industries Power Company Limited
P.O. Ranoli, Dist.- Vadodara
PIN – 391350
Gujarat, India

Email: snpurohit@gipcl.com

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Annexure – 1

Technical Specification Data

(To be submitted by the Applicant as per Clause No. 7 of EOI)

Name of Applicant: _____

The details of technical specification data (Production & Consumption) are following :

Sr. No.	Description	5 MW Electrolyzer	10 MW Electrolyzer
Details of Electrolyzer:			
1	Type of Electrolyzer (Alkali or PEM or anyother)		
2	Name of Manufacturer		
3	Country of Origin		
4	Model No.		
5	Module size (kW)		
6	Hydrogen Generation per Module (kg/hr)		
7	Nos. Of Modules in Electrolyzer Stack (Nos.)		
8	Pressure of Hydrogen at delivery point (BAR(g))		
9	Temperature of Hydrogen at delivery point (deg C)		
10 10a 10b 10c 10d 10e 10f	**Effluent generation data with Quality:** -solid (if any) -liquid (if any) -gaseous (if any) **Effluent Quantity:** -Solid effluent quality -Liquid effluent quality -Gaseous effluent quality		
11	Requirement of Effluent treatment		
12	Electrode material		
13	Electrolyte type & make up quantity		
14	Cell temperature		
15	Efficiency		
16	Start-up time (up to full load)		
17	High ramp up/down capability		
18	Ramp up capability		
19	Minimum or Turndown load		
20	Electrolyzer Stack life in hours		
21	Electrolyzer Stack replacement frequency (hrs.)		
22	Electrode coating requirement (if any) & coating frequency		
23	Expected life of entire project as a whole (Years)		
24	Annual maintenance requirement Maintenance Activities with frequency		

25	No of shutdown days per year		
Products at Battery Limit			
26	Hydrogen Production (kg/hr)		
27	Oxygen Production (Kg/hr)		
28	Other Byproduct, if any (kg/hr)		
Utility Requirement			
29	Power Requirement:		
29a	Total Power Consumption of plant (MW)		
29b	Electrolyzer Power (MW)		
29c	Auxiliaries Power (KW)		
30	Cooling Water		
30a	Flow (m^3/hr)		
30b	Pressure (kg/cm^2)		
30c	Inlet / Outlet Temperature (^{O}C)		
31	DM Water (m3/h)		
31a	Flow (m^3/hr)		
31b	Pressure (kg/cm^2)		
31c	Inlet Temperature (^{O}C)		
32	Nitrogen Requirement (If any) :		
32a	Nitrogen (Nm3/h) – Normal		
32b	Nitrogen (Nm3/h) – Peak		
33	Instrument Air (Nm3/hr.)		
34	Service Air (Nm3/hr)		
35	Others, if any Please Specify		
36	Land Area Required (m^2)		
Adsorbents/Chemicals/ Catalyst			
First Charge			
37	Adsorbents/ Catalyst 1 (Name / Quantity / Life)		
38	Adsorbents/ Catalyst 2 (Name / Quantity / Life)		
39	Adsorbents/ Catalyst 3 (Name / Quantity / Life)		
Continuous Consumption			
40	Chemical 1 (Name / Quantity)		
41	Chemical 2 (Name / Quantity)		
42	Chemical 3 (Name / Quantity)		
43	Chemical 4 (Name / Quantity)		
44	Chemical 5 (Name / Quantity)		
Guarantee Conditions			
45	Hydrogen Production in standard operating conditions (kg/hr.)		
46	Pressure of Hydrogen Produced (Bar_g)		
47	Minimum Purity of Hydrogen (% by Volume)		
48	Maximum Moisture in Hydrogen (ppm)		
49	Maximum Oxygen in Hydrogen (ppm)		
50	Maximum Alkali content in Hydrogen (ppm)		

51	Any other impurities (Applicant to specify with limits)		
52	Electricity Consumption for Hydrogen Generation (kwh / kg of H_2)		
53	DM Water Consumption for Hydrogen Generation (Litre / kg of H_2)		
54	Electrolyzer Stack life in hrs.		
55	Degradation factor for Hydrogen Generation as % of Rated capacity/Year Note: If degradation is not constant for the given life of Electrolyzer then specify year wise degradation.		
56	Guarantee / Warrantee:		
56a	- For Electrolyzer Stack		
56b	- For Balance of plant		

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