I/7601/2023

ENERGY MANAGEMENT CENTRE -KERALA

Department of Power, Government of Kerala

Thiruvananthapuram, Kerala – 695 017;

www.keralaenergy.gov.in

EXPRESSION OF INTEREST (EOI)
For Implementation of Demonstration Projects on Hydrogen Fuel Technologies

Ref. No.: EMC/34/2023-ETB-3(EED)/EOI-1

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PROCEDURE AND GUIDELINES

EXPRESSION OF INTEREST FOR:

1. **Installation of Electrolyser for Hydrogen generation**
2. **Installation of Hydrogen Storage and Dispensing Unit for Hydrogen Powered Vehicles**
3. **Installation of Fuelcell (Input Fuel - Hydrogen)**
4. **Installation of Fuelcell (Input Fuel – Methane/LNG/CNG/Biogas/Peat gas/any other suitable fuel)**

Respondents can submit EOI for either one of the above or combination of mentioned items

INFORMATION TO RESPONDENTS

1. Description of State

Kerala is one of the states located in the southern part of the Republic of India. It occupies a narrow strip of land between the Arabian Sea in the West and the Western Ghats in the East. The States of Karnataka and Tamil Nadu lie in the North – East and South – East respectively.

Kerala is gifted with appreciable fresh water resources and suitable for generation of electricity from renewable sources such as solar wind and small hydro.

2. Background

Kerala aspires to become a 100% renewable energy-based State by 2040 and net carbon neutral by 2050. As part of this goal various activities are proposed and in progress to increase the RE generation and carbon neutrality. Even though the major share of electricity generation in Kerala is from hydel power plants it accounts to only 30% of it's requirement. Remaining is procured from the national grid.

To become a 100% RE state energy storage systems are very essential. Hydrogen is found to be a versatile form of energy storage, by generating it from additional electricity generated from RE sources during off-peak hours and it can be used for electricity generation during peak hours. It can also be used for fueling the hydrogen powered vehicles, industrial heating applications etc. It can be considered as a clean burning fuel producing only water vapor as its byproduct.

However hydrogen production storage and utilization for electricity generation and transportation in it's nascent stage Kerala government is very keen in to introduce and promote its use within the state.

3. About EMC

Energy Management Centre – Kerala (EMC) was established by Kerala Government, aiming primarily to remould and instrumentalise energy sector as a catalyst in promoting a development process which is ecologically sustainable.

With a view to making energy sector achieve such a lead and catalytic role, EMC has evolved a novel and comprehensive energy management approach and institutional philosophy encompassing management of energy technology systems – both

conventional and non-conventional, energy conservation in all sectors of the economy, energy resource management, rural and urban energy systems, energy education and training, energy generation and conservation-based employment and poverty alleviation programmes. The Small Hydro Promotion Cell, functioning in EMC under the Chairmanship of the Principal Secretary (Power), Govt. of Kerala scrutinizes and recommend for issuing technical clearance for the small/mini/micro hydel projects in the state.

EMC is also the State Designated Agency (SDA) of Bureau of Energy Efficiency (BEE), Ministry of Power, Government of India to coordinate, enforce and implement Energy Conservation Act-2001 (Central Act 52 of 2002) in Kerala. EMC is working towards attaining energy efficiency in all sectors of economy.

4. Objective and Scope of EOI:

Government is keen in to bring the hydrogen fuel technologies in the land of Kerala as a fuel for transportation, electricity generation and a sink for energy storage.

Since the green hydrogen technologies are in developing stage all around the globe Kerala Government is planning for implementing some Pilot/Demonstration projects to understand its possibilities potential and techno economic viability.

In this context, EMC now invites Expression of Interest from the interested OEMs, Startups, and Developers with preferably indigenous capability to Supply and install Hydrogen Electrolyser, Storage & Dispenser Unit and Fuel Cell.

The Respondents for this EoI is provided with an opportunity to apply for one or more pilot implementation in a suitable location in Kerala as detailed as follows.

1. Supply installation and commissioning of Electrolyser for Hydrogen generation
2. Supply installation and commissioning of Hydrogen Storage and Dispensing Unit for Hydrogen Powered Vehicles
3. Supply installation and commissioning of Fuelcell (Input Fuel - Hydrogen)
4. Supply installation and commissioning of Fuel cell (Input Fuel – Methane/LNG/CNG/Biogas/any other suitable fuel)

5. Qualification criteria

The prospective Respondent must conform to the pre-qualification criteria given below and shall attach proof of documents for each of the qualifying requirements. EoIs without adequate supporting documents shall be treated as non-responsive. The EoIs will be considered as responsive only if the lead member of the Respondents satisfy all the conditions mentioned below:

Sl	Criteria	Proofs to be produced
A	The agency should have been in the business of providing technological Services in India or abroad for a period of at least two or more years as on 31/12/2022. The agency should be a private/public limited company with proven track record in consultancy/implementation/ research for Green Hydrogen projects including production or storage or transportation or other renewable energy projects. Preference shall be given to the companies registered in India or companies having tie ups with Indian Manufacturers (Electrical or electronics equipment only).	Company incorporation certificate or other registration certificate to be produced as proof. Copy of latest GST Return (if applicable) PAN Card Copy (if applicable) Self-Certification stating that the Company/ LLP/Firm or its Subsidiaries / Individual/ Associates are not Debarred / Blacklisted by any Central / State Governments, Government Departments, Government Bodies or PSUs/local Government entities (in case of a foreign firm).. Copy of MOA and AOA/ Partnership deed and certificate of incorporation/ registration in case of firms.
B	Total turn over the agency shall be more than Rs. 100 lakhs over the last three years from Hydrogen based technologies business. The agency	Audited Balance Sheet and P&L for the immediate past three financial years.

	should be a dedicated technology company with dependable credentials and service history. For agencies with multiple service verticals, 10% or minimum INR 100 Lakhs, of their total turnover should be from hydrogen based technologies business.	
C	Past experience in installation and commissioning project of similar kind in India or abroad (Minimum one Hydrogen technology project (Production or transportation or storage or fuel cell implimentation)	Work completion certificate / Reports of the commissioned projects / Work orders etc.
D	The agency should have an office in India, and should have at least facility for assembly of the relevant equipment and spare parts availability (in case of international tie-ups) and a team of expert professionals to manage it. The core team designated for this assignment by the agency should have ample academic qualifications and practical expertise in the relevant area with proven track record.	Documents to establish company's presence in India; such as lease deed or office ownership documents Proof/Details of company's infrastructure - may be subjected to verification – Credentials of team of professionals
E	Approach and methodology to implement a pilot project of the technology you are applying for through EPC contract with obligation	Approach & Methodology Document with technocomercial aspects and the following Articulation of design and

	to carryout annual maintenance. The proposal shall be to install a plant with the Minimum standard capacity.	project layout Time required to complete the installation once the order is placed. Details of periodic maintenance required Technical specifications
F	Willingness and capability to undergo a contract with Energy Management centre in EPC mode, with obligation to carryout Annual maintenance contract during this period.	Duly signed willingness letter in company's letter head.

1. Submission of EOI

Interested agencies are required to submit the response with the complete information of the above (Qualification Criteria) in all respects along with enclosed format (Refer Annexure-1) and a brief write up about the Company/ Promoters/LLP Profile/ Firm/Consortium(In case of consortium, the Respondent should submit the consortium Agreement between the consortium partners.

Prospective parties shall upload their 'Expression of Interest' duly signed by the authorised signatory along with relevant details as sought in the data sheets latest by the last date specified in the cover page of this document.

Link to Upload EoI: https://forms.gle/cfwbyppoLRKMk5dA8

The hardcopy of the 'Expression of Interest' duly signed by the authorized signatory shall reach at EMC office within 5 days form the last day for online submission for the EoI in a sealed cover super scribing.

"Expression of Interest for Implementation of Demonstration Projects on Hydrogen Fuel Technologies"

Addressed to:
The Director
Energy Management Centre - ,
Sreekrishna Nagar, Sreekariyam P O
Thiruvananthapuram -695017, Kerala
Phone: 0471-2594922, 2594924
For any clarification, prospective parties are requested to contact the above contact numbers.

6. Other conditions

Prospective respondent (Applicants)to this EOI acknowledges and agrees that:

- EMC has issued this document for Expression of Interest with the best intention to explore the market for eligible and interested Respondents and has no compulsions to enter into definitive contractual agreements. This EOI does not guarantee conversion of this EOI into any definitive contractual agreements.
- It is also agreed that EMC in its sole discretion, may reject any and all proposals made by respondents, may change the conditions relating to the EOI or cancel this EOI at any time without assigning any reason.
- Prospective respondent(s) acknowledge and agree that response to the EOI is purely voluntary action on their part and for any expenditure on this account shall be borne by the respondent(s).
- EMC will have the right to award more pilot projects, if different technologies are to be validated.
- EMC will have no obligation or liability to the respondent(s) in the event of cancellation of EOI.

Note: Applicants are requested to keep themselves updated with the website www.keralaenergy.gov.in on regular basis for any addition / deletion / modification/clarification or notification in respect of this, at EOI stage and at bidding stage. No separate notification will be issued in any other media.

7. Annexure -1 – Summary Sheet to be submitted by the Respondent

Sl. No.	Parameters	Details (may attach separate sheets)
i.	**Name of the Company and address of the registered office**	
	Name, email and contract No of key personal	
ii.	Country where the company is registered	
iii.	Status of the Company: a) Whether registered under the Companies Act 1956 / the Companies Act 2013 b) If not, other details (like sole proprietorship firm/partnership firm etc)	
iv.	Nature/Origin/Status/Recognition of Technology options and Operational Requirements of Proposed Technology	
v.	Submitting the proposal for	Supply installation and commissioning of Electrolyser for Hydrogen generation Supply installation and commissioning of Hydrogen Storage and Dispensing Unit for Hydrogen Powered Vehicles Supply installation and commissioning of Fuelcell (Input Fuel - Hydrogen) Supply installation and commissioning of Fuelcell (Input Fuel – Methane/LNG/CNG/Biogas/any other suitable fuel)

Technical submittals for Supply installation and commissioning of Electrolyser for Hydrogen generation

i	Name of the technology	
ii	Attach a presentation regarding technology	
iii	**Minimum Standard** Output capacity of the plant that can be installed	---- kg/hr of Hydrogen or specify range from --kg/hr to – kg/hr
	Input electricity and water required	---V -- Hz -- kW 1P or 3P -- kwh/kg of Hydrogen -- LPH of water
iv	**Medium Standard** Output capacity of the plant that can be installed	---- kg/hr of Hydrogen or specify range from --kg/hr to – kg/hr
	Input electricity and water required	---V -- Hz -- kW 1P or 3P -- kwh/kg of Hydrogen -- LPH of water
v	**Maximum Standard** Output capacity of the plant that can be installed	---- kg/hr of Hydrogen or specify range from --kg/hr to – kg/hr
	Input electricity and water required	---V -- Hz -- kW 1P or 3P -- kwh/kg of Hydrogen -- LPH of water
vi	Indicative unit cost for supply and installation of Minimum capacity range plant	Provide the rate in Rupees per 1 kg/hr capacity plant

vii	Indicative unit cost for supply and installation of Minimum capacity range plant	Provide the rate in Rupees per 1 kg/hr capacity plant
viii	Indicative unit cost for supply and installation of Minimum capacity range plant	Provide the rate in Rupees per 1 kg/hr capacity plant
ix	Land area required per kg/hr of Hydrogen electrolyser	In square meter
x	Details of clearances and approvals required prior to implementation	
xi	Any other relevant information	

Technical submittals for Supply installation and commissioning of Hydrogen storage and dispensing unit

i	Name of the technology	
ii	Attach a presentation regarding technology	
iii	**Minimum Standard** storage capacity of the plant that can be installed	---- kg of Hydrogen or specify range from --kg to – kg Volume – cubic meter Storage pressure in bar Dispensing pressure in bar
	Input electricity required (if required)	---V -- Hz -- kW 1P or 3P
iv	**Medium Standard** storage capacity of the plant that can be installed	---- kg of Hydrogen or specify range from --kg to – kg Volume – cubic meter Storage pressure in bar Dispensing pressure in bar
	Input electricity and water required (if required)	---V -- Hz -- kW

		1P or 3P
v	**Maximum Standard** storage capacity of the plant that can be installed	---- kg of Hydrogen or specify range from --kg to – kg Volume – cubic meter Storage pressure in bar Dispensing pressure in bar
	Input electricity required (if required)	---V -- Hz -- kW 1P or 3P
vi	Indicative unit cost for supply and installation of Minimum capacity range plant	Provide the rate in Rupees per 1 kg storage capacity plant
vii	Indicative unit cost for supply and installation of Minimum capacity range plant	Provide the rate in Rupees per 1 kg storage capacity plant
viii	Indicative unit cost for supply and installation of Minimum capacity range plant	Provide the rate in Rupees per 1 kg storage capacity plant
ix	Land area required per 1 kg of Hydrogen storage plant including all accessories	In square meter
x	Details of clearances and approvals required prior to implementation	
xi	Any other relevant information	

Technical submittals for Supply installation and commissioning of the Fuel cell (Hydrogen fuel)

i	Name of the technology	
ii	Attach a presentation regarding technology	
iii	**Minimum Standard** capacity of Fuel cell that can be installed	---- kw or specify range from --kw to – kw Output voltage

	Input requirement	-- kg of Hydrogen per kwh Any other input required or auxiliary electricity requirement
iv	**Medium Standard** capacity of Fuel cell that can be installed	---- kw or specify range from --kw to – kw Output voltage
	Input requirement	-- kg of Hydrogen per kwh Any other input required or auxiliary electricity requirement
v	**Maximum Standard** capacity of Fuel cell that can be installed	---- kw or specify range from --kw to – kw Output voltage
	Input requirement	-- kg of Hydrogen per kwh Any other input required or auxiliary electricity requirement
vi	Indicative unit cost for supply and installation of Minimum capacity fuel cell	Provide the rate in Rupees per kW
vii	Indicative unit cost for supply and installation of Minimum capacity fuel cell	Provide the rate in Rupees per kW
viii	Indicative unit cost for supply and installation of Minimum capacity fuel cell	Provide the rate in Rupees per kW
ix	Land area required per kW capacity fuelcell	In square meter
x	Details of clearances and approvals required prior to implementation	
xi	Any other relevant information	

Technical submittals for Supply installation and commissioning of the Fuel cell (Input Fuel – Methane/LNG/CNG/Biogas/Peat gas/any other suitable fuel)

i	Name of the technology	
ii	Attach a presentation regarding technology	
iii	**Minimum Standard** capacity of Fuel cell that can be installed	---- kw or specify range from --kw to – kw Output voltage
	Input requirement	Fuel type --- -- kg of fuel per kwh Any other input required or auxiliary electricity requirement
iv	**Medium Standard** capacity of Fuel cell that can be installed	---- kw or specify range from --kw to – kw Output voltage
	Input requirement	Fuel type --- -- kg of fuel per kwh Any other input required or auxiliary electricity requirement
v	**Maximum Standard** capacity of Fuel cell that can be installed	---- kw or specify range from --kw to – kw Output voltage

	Input requirement	Fuel type --- -- kg of fuel per kwh Any other input required or auxiliary electricity requirement
vi	Indicative unit cost for supply and installation of Minimum capacity fuel cell	Provide the rate in Rupees per kW
vii	Indicative unit cost for supply and installation of Minimum capacity fuel cell	Provide the rate in Rupees per kW
viii	Indicative unit cost for supply and installation of Minimum capacity fuel cell	Provide the rate in Rupees per kW
ix	Land area required per kW capacity fuel cell	In square meter
x	Details of clearances and approvals required prior to implementation	
xi	Any other relevant information	

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