



MAHARASHTRA METRO RAIL CORPORATION LIMITED

CIN: U60100MH2015SGC262054

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EXPRESSION OF INTEREST (EOI)

FOR SELECTION OF

PRIVATE VENDOR FOR SETTING UP THE ELECTRIC CHARGING STATIONS FOR FEEDER SERVICES AT METRO STATIONS, NAGPUR METRO RAIL, NAGPUR

EoI Ref. No: NMRCL/Plg/MMI/2019/422

Date: 08th March, 2019

Maharashtra Metro Rail Corporation (Maha Metro) is undertaking provisions of Multi-Modal Integrated facilities at Nagpur Metro stations. Provision of seamless, hassle-free, convenient, smooth and integrated first and last mile connectivity or feeder services at Metro stations are major objectives of Maha Metro Nagpur. The work on 3 at grade Metro stations have been completed and the Metro operations have been conducted on these stations on Priority Section.

Maha Metro intends to initiate feeder services operations at some of the Metro stations lined up for completion and operation within the next 3-6 months' time. As a part of feeder services, Maha Metro intends to operate electric vehicles at all the metro stations and at present it is in the process of mobilising the resources. While mobilising the electric vehicles, it is felt necessary to setup the common charging stations at all the metro stations and at parking locations. In this regard, Maha Metro invites Expression of Interest (EOI) for ***“Selection of Private Vendor for Setting Up the Electric Charging Stations to operate and maintain the small & medium capacity feeder services at the Nagpur Metro stations”***. In due course, this process may be followed by a Request for Proposal (RfP) to engage the Prospective bidders/firms/agencies who can be Vendors.

The salient features of EoI are appended below:

Sr No	Description	Details
1.	Issuing officer	Executive Director(Planning), Maha Metro, Nagpur
2.	Address of issuing officer	Metro House, Bungalow No: 28/2, Anand Nagar,C K Naidu Road, Civil Lines, Nagpur-440001
3.	Phone and Fax No	Direct: 8319969726 :9823167153(JGM/Maha-Metro/ Incharge MMI)
4.	Website	www.mahametro.org
5.	Date of issue of EOI	08 th March 2019
6.	Last date and time of submission of EoI	29 th March 2019 till 5 p.m.
7.	Date and time of meeting with Private Operators/Aggregators/Vendors/Dealers/Manufacturers for brain storming	15 th March 2019 at 11.00 a.m. to 1.30 p.m. at Metro House, Nagpur.
8.	All concerned are requested to send in their company and business profile, technical details, technology proposed and the preferred mode of engagement as to enable Maha Metro Nagpur to bring out an RFP to engage suitably with the prospective Private Vendors.	
9.	Fee for EoI submission	Nil
10.	Mode of Submission	Hard copy or soft copy (email)
11.	Project name	Selection of Private Vendor for Setting Up the Electric Charging Stations to operate and maintain the small & medium capacity feeder services at the Nagpur Metro stations
12.	Scope of Authority	To set up electric charging stations and to make payment as per T&C
13.	Scope of operators	To setup electric charging stations at metro stations and at parking places as specified by Maha Metro for charging the feeder services at Nagpur Metro Rail Stations
14.	Project location	Nagpur Metro Stations and at Parking Locations as mentioned by Maha Metro
15.	Details of Charging Stations	As per Annexure -C
16.	No of Charging Stations	10 numbers at initial stage, to be scaled up to 50 within the next one and half year
17.	No of metro stations	38

Sr No	Description	Details			
18.	Mode of engagement	Will be discussed based in EoI meeting			
19.	Eligibility criteria (Tentative, to be discussed at the EoI Meeting)	Financial Qualification Criteria			
		The Average Annual turnover of the bidder for each of the last three financial years ending 31 st March 2018 (2015-16, 2016-17 & 2017-18,). In case of consortium bids, combined turnover of all the consortium partners shall be considered, subject to the lead bidder(s) and the other consortium members having a turnover of minimum 40% and minimum 25% respectively of this requirement).	INR 2-2.5 Crores.	Audited Financial Statements and certificate from Chartered Accountant stating turnover from each relevant line of business.	
		Net worth in last financial year should not be less than 100% of paid up capital. (To be satisfied by each member in case of consortium.)	Y/N	Audited Financial Statements	
		Profitability in each of these 3 years ending 31 st March 2018 (To be satisfied by each member in case of consortium.)	Positive in at least two of past three years. Mandatory for the last financial year.	Audited Financial Statements	
		Technical Qualification Criteria			
Lead Bidder should have experience in the business of manufacturing of Electrical equipment related to Battery chargers, storage, AC - DC converters and metering	For the last 3 years prior to the date of the submission of proposal in response to the tender.	Excise Return / GST Return. For international bidder relevant documents that confirm the condition is met may be provided.			

Sr No	Description	Details	
		The product offered by the bidder(s) (including Consortium) for supply against this Tender must meet the Technical Specifications as stipulated in the Tender, and the bidder(s) must be able to provide the after-sales warranty and Annual Maintenance Contract.	The bidder should provide test reports (including AIS-138 test certificate), specification, ARAI certificate of compliance of chargers with inter-operability standards and brochures and other details along with the tender document. Documentary proof must include the test certificates, interoperability testing certificate from ARAI, Pune at the time of bid submission brochures, catalogs etc.
20.	No of vendors	As per the clusters/bundling	
21.	Revenue Sharing	By Operator/By Authority depending on the Bidding model	
22.	Operation period	3 years to 5 years	
23.	Charging Station ownership	Private Vendors	
24.	Consortium	Can be allowed	
25.	Basis of payment	Will be discussed in EoI meeting and innovative models (if any) benefiting citizens suggested are also welcome which could be discussed during brain-storming. Some of these or any other mode of payment, depending on bid parameter shall be incorporated in the Request for Proposal document (RfP), which shall follow the present EoI process.	

Prospective bidders/firms/agencies concerned are requested to send in their company and business profile, Project details including technical details, technology used etc. in the format requested through Annexure A & Annexure B attached with this EoI notice. Prospective bidders/firms/agencies can also give suggestions on the technology they propose and the preferred mode of engagement with Maha Metro for the present work in the cover letter separately; so as to enable Maha Metro, Nagpur to evolve a suitable mechanism through RfP to engage the prospective bidders/firms/agencies within the next 1 (one) month period.

The Prospective bidders/firms/agencies are requested to send a signed copy of this EoI document along with the details requested through Annexures A&B, along with a signed cover letter with their queries if any, on the information/criteria provided in the EOI document, to mahesh.gupta@mahametro.org and mminmrcl@gmail.com through email or submit the same at JGM/Civil (In-charge, MMI), Maha Metro, at Metro House, Bungalow No:28/2, Anand Nagar , C K Naidu Road, Civil Lines, Nagpur-440001 through post or by-hand before 29th March, 2019 till 5 p.m.

Maha Metro, Nagpur shall also organize a meeting to discuss further on this EoI, the eligibility criteria, the technical, financial and operations aspects along with preferred mode of engagements with the prospective bidders/firms/agencies on 15th March 2019 at 11.00 a.m. to 1.30 p.m.

All participants are requested to visit <https://www.mahametro.org> for further information, addendum, replies to queries & other details on regular basis.

Maha Metro, Nagpur reserves the right to accept or reject any EoI document and to annul this process at any time, without incurring any liability and without assigning any reason thereof.

Technical Capacity / Experience Statement of Prospective bidders/firms/agencies
Information provided to be signed by an authorised representative of the prospective bidder/firm/agency

Name of the prospective bidder/firm/agency:
1. Name of the Project/Contract:
2. Location:
3. Project Details: Technology used (Vehicle type), Mode of Engagement, prospective bidder/firm/agency's role in the same etc
4. Name, Address, Contact Person, Tel/Fax of the Other Members and their roles in the Project:
5. Any Other related information:

Note:

- a) Prospective bidder/firm/agency shall provide self-attested copies of all the documents regarding experience (Agreement copies, work orders, letter of intents, completion certificates(if any) etc if required by Maha Metro at any time
- b) Projects could be more than 1(one). Separate sheet to be used for each project in this case

Financial Capability Statement

This statement should be submitted on prospective bidder/Firm/agency 's Letter Head duly signed by a Chartered Accountant and countersigned by an authorised representative of the Prospective bidder/firm/agency

Sr.No	Parameters	Financial years (Rs. Lakhs)		
		2015-16	2016-17	2017-18
1	Turnover			
2	Total Assets			
3	Current Assets			
4	Total Liabilities			
5	Current Liabilities			
6	Profit before Tax			
7	Profit after Tax			
8	Net Worth*			

Note:

- a) *Net Worth = Equity Capital + Reserve and Surplus - Revaluation Reserve - Accumulated losses - Intangible assets

Electric Vehicle Charger Specification:

The desired functional and technical specifications of charging equipment (as per Indian conditions) have been mentioned in the subsequent sections of this document. However, the intent is not to specify and capture all the aspects of design and installation associated with charging equipment mentioned herein. It shall be the obligation of bidder(s) that all the systems, sub-systems and equipment/devices shall conform in all respect to high standards of engineering, design and workmanship, and shall be capable of performing continuous commercial operation as per best industry standards.

1.1 Bharat EV AC Charger (BEVC-AC001)

This section presents the specifications of a Public metered AC outlet (PMAO) which is to provide AC input to the vehicle which has on-board chargers. This applies to electric road vehicles for charging at 230V standard single phase AC supply with a maximum output of 15A and at a maximum output power of 3.3kW. PMAO is a slow charger for low-power vehicles.

1.1.1 General Requirements

The EV shall be connected to PMAO for conductive energy transfer function. The system will have following general specifications:

- a) PMAO is supplied with three phase AC power and outputs single phase AC power.
- b) Energy Transfer Mode is Conductive.
- c) Each outlet will have up to three independent charging sockets.
- d) The PMAO has built-in metering, safety & monitoring.
- e) PMAO and Central Management System (CMS) communicate with each other to serve purposes of firmware, reservation, cancellation, addition and deletion of PMAOs etc.

1.1.2 Input Requirements

- f) A.C. Supply System is 3 phase, 5 wire AC system (3 phases + N + PE)
- g) Nominal Input Voltage is 415V (+6% and -10%) as per IS 12360
- h) Input Frequency is 50Hz \pm 1.5 Hz
- i) Input Supply Failure back-up: Battery backup for minimum 1 hour for the control system and billing unit. Data logs should be synchronized with CMS during back up time, in case battery drains out.

1.1.3 Output Requirements

- j) Number of Outputs: 3
- k) Type of each output: A.C., 230V (+6% and -10%) single phase as per IS 12360
- l) Output Details: 3 Independent charging sockets as per IEC 60309. Female connector to be used on the PMAO Side
- m) Output Current: Three vehicles charging simultaneously, each at 15A current
- n) Output Connector Compatibility: IEC 60309 Industrial Blue connectors to be used.
- o) Connector Mounting: ensure IP 54. Angled connector mounted looking downwards for

- outdoor use is preferred.
- p) Double-pole breaking RCD (IEC 60309 Blue connector) of less than 30mA (As per section 7.4 of AIS 138 Part 1) is recommended.
 - q) Limiting Output Current: Circuit breaker for each outlet limited to 16A current output. Breaker should be reset to resume operation.
 - r) Output selection: the breaker inside to be energized in sequence - one round of all three phases before the second round.
 - s) Socket readiness: An LED to indicate that the socket is ready.
 - 1) Three LEDs, one for each Phase/socket shall indicate the readiness/in-use status
 - 2) LED failure/ LED not glowing shall mean that socket is not ready
 - t) Isolation: Charger shall comply with class 1 or class 2 insulation class as defined in AIS 138 Part 1, clause 3.3.1 and 3.3.2.

1.1.4 User Interface and Display requirements

- u) Visual Indicator: Error indication, Presence of input supply indication, Charge process indication and other relevant information.
- v) Display Messages: PMAO should display appropriate messages for user during the various charging stages like
 - 1) Suggestive sequence of charger operation
 - 2) Vehicle plugged in / Vehicle plugged out
 - 3) Duration since start of charge, kWh consumed
 - 4) Authorization status
 - 5) Fault conditions
- w) ON- OFF (Start-Stop) switches
- x) Emergency Stop Switch is mushroom headed push button type (Red color), visible and easily accessible
- y) Display Screen Size is minimum 3.5" inches with 720x480 pixels, user interface can be touch screen or keypad.
- z) User Authentication is by using mobile application or user interface (OCPP gives only a field mandate, media to be used is open).
- aa) Metering Information: Consumption Units

1.1.5 Billing and Payment Requirements

- bb) Metering - metering as per units consumed for charging the battery of each vehicle as per Indian standards.
- cc) Billing – Grid Responsive Billing
Payment –BHIM / Bharat QR or UPI complaint mobile application payment

1.1.6 Protection and Safety Requirements

- dd) Safety Parameters: Safety and protection to be ensured for India specific environment (As per AIS 138 Part1).
- ee) EMI/EMC: as per AIS 138-1 (section 11.11.3.2)

- ff) Start of Charging: The outlet will be locked and covered, the connector will be exposed to charging only after user authentication using user interface or mobile application. Only when the lock opens and connector is properly connected, the switch/relay will turn ON to feed power to EV.
 - 1) Lock will be opened only after full charging and authentication by user or the operator (the authentication procedure is detailed in Annexure B)
 - 2) Once disconnected, the charging session terminates.
- gg) Power failure: If there is a power failure, user is indicated
 - 1) If the user wants to terminate the session, the user can shut-off the switch and remove the plug
 - 2) If user does not remove the plug, the charging resumes when power comes back.
- hh) Interruption of Charging:
 - 1) Temperature based safety mechanism to trigger switching off of the charging to ensure the temperature is not more than 80°C for a duration less than 10s. In such situation, an appropriate signal will be sent to turn the switch/relay OFF in order to stop the charging. Once disconnected, the charging session terminates.
 - 3) If plug is taken out (for more than 2 seconds) and then reinserted for charging, the charging-session will disconnect. A new session will be required to continue charging.
 - 4) These shall ensure that no one can remove a vehicle being charged and insert their own cable and use the infrastructure without paying or at someone else's account

1.1.7 Mechanical Requirements

- a) Suggested Cable Security: PMAO should have locking mechanism for the connector while charging. The vehicle may also have locking mechanism during charging to ensure the safety of the cable (Suggestion to OEM to have shutter lock for security purpose of the cable during charging session).
- b) Mechanical Stability:
 - 1) Shall not be damaged by mechanical impact energy: 20 J (5 kg at 0.4 m) (Section 11.11.2.2. of AIS 138 Part 1).
 - 2) IP Ratings: IP 54 (Section 11.11.2.4. of AIS 138 Part 1).
 Cooling: Air cooled or forced air cooled to protect the equipment against temperature hazards.

1.1.8 Environment Requirements

- a. Ambient Temperature Range: 0 to 55°C
- b. Ambient Humidity: 5 to 95% as per AIS 138 Part 1 section 11.2
- c. Ambient Pressure: 86 kpa to 106 kpa as per AIS 138 Part 1 section 11.11.2.4
- d. Storage temperature: 0 to 60°C

1.1.9 Communication Requirements

- ii) Communication between PMAO and Central Management System: Open Charge Point Protocol (OCPP) 1.5 protocol.

- 1) The higher versions of OCCP if used should be compatible to OCCP1.5.
 - 2) Should enable handshaking between PMAO and CMS for discovery.
 - 3) It should authorize the operation, before electric vehicle can start or stop charging
 - 4) PMAO should respond to CMS for various queries and commands like reservation, cancellation and other functions specified on OCCP.
- jj) Metering: Grid responsive metering as per units consumption of each vehicle
- kk) Interface between charger and central management system(CMS): Reliable Internet Connectivity

1.1.10 AC001 Specification Summary

The specifications discussed previously are summarized in the table below:

#	Parameter	Requirement
General Requirements		
1	EVSE Type	AC
2	Energy Transfer Mode	Conductive
Input Requirements		
1	AC Supply System	Three-Phase, 5 Wire AC system (3Ph.+N+PE)
2	Nominal Input voltage	415V (+6% and -10%) as per IS 12360
3	Input Frequency	50Hz, ± 1.5 Hz
4	Input Supply Failure backup	Battery backup for minimum 1 hour for the control system and billing unit. Data logs should be synchronized with CMS during back up time, in case battery drains out.
Environmental Requirements		
1	Ambient Temperature Range	0 to 55°C
2	Ambient Humidity	5 to 95%
3	Ambient Pressure	86 kpa to 106 kpa
4	Storage temperature	0 to 60°C
Mechanical Requirements		
1	Suggested Cable Security	PMAO and the vehicle connector outlet to have provision for locking mechanism during charging to ensure the safety of the cable
2	Mechanical Stability	Shall not be damaged by mechanical impact impact energy : 20 J (5 kg at 0.4 m)
3	IP Ratings	IP 55
4	Cooling	Air cooled or forced air cooled to protect the equipment against temperature hazards
Output Requirements		
1	Number of outputs	3
2	Type of each output	230V (+6% and -10%) single phase, 15A as per IS 12360A.C.

#	Parameter	Requirement
3	Output Details	3 Independent charging sockets, given in Annex-A
4	Output Current	Three Vehicles charging simultaneously, each at 15A current
5	Output Connector Compatibility	IEC 60309
6	Limiting output current	Circuit breaker for each outlet limited to 16A current output. Breaker should be reset to resume operation
7	Connector Mounting	Angled connector mounted looking downwards for outdoor use
8	Isolation	class 1 or class 2 insulation as per AIS138 (3.3.1 and 3.3.2)
User Interface & Display Requirements		
1	ON- OFF (Start-Stop) switches	Mandatory
2	Emergency stop switch	Mushroom headed Push button type (Red color), visible and easily accessible
3	Visual Indicators	Error indication, Presence of input supply indication, Charge process indication and other relevant information
4	Display size	Minimum 3.5" inches with 720 x 480 pixels, user interface through touch screen / keypad
5	Display Messages	EVSE should display appropriate messages for user during the various charging states like <ul style="list-style-type: none"> • Vehicle plugged in / Vehicle plugged out • Fault conditions; metering: units consumption; Duration since start of charge, kWh
6	User Authentication	Using mobile application or User interface (OCPP gives only a field mandate, media to be used is open)
7	Metering Information	Consumption Units
Billing & Payment Requirements		
1	Metering	Metering as per units' consumption for charging each vehicle
2	Billing	Grid responsive billing
3	Payment	BHIM / Bharat QR or UPI compliant mobile application payment
Communication Requirements		
1	Communication between EVSE and Central Server	Open Charge Point Protocol (OCPP) 1.5 protocol or higher versions compatible to OCPP 1.5
2	Metering	Grid responsive metering as per units' consumption of each vehicle
3	Interface between charger and central management	Reliable Internet Connectivity

#	Parameter	Requirement
	system(CMS)	
Protection & Safety Requirements		
1	Safety Parameters	Safety and protection to be ensured for India specific environment (As per AIS 138 Part1)
2	Start of Charging	The outlet will be locked and covered, the connector will be exposed to charging only after user authentication using user interface or mobile application. Only when the lock opens and connector is properly connected, the switch/relay will turn ON to feed power to EV. Lock will be opened only after full charging and authentication by user or the operator. Once disconnected, the charging session terminates. The authentication procedure is detailed in Annex B.
3	Power failure	If there is a power failure, user is indicated about this. The charging resumes when power comes on. If the user wants to terminate the session during power failure, the user can shut-off the switch and remove the plug
4	Interruption of Charging	<p>Connector terminals to be mounted with temperature sensors to avoid burning of connectors. Safety mechanism to trigger switching off of the charging at temp.>80°C for a duration <10s. In such situation, an appropriate signal will be sent to turn the switch/relay OFF to stop the charging. Once disconnected, the charging session terminates.</p> <p>If the above locking mechanism is mandated then the following point won't be required: If plug is taken out (for more than 2 seconds) and then reinserted for charging, the charging-session will disconnect. A new session will be required to continue charging to ensure that no one can remove a vehicle being charged and insert their own cable and use the infrastructure without paying or at someone else's account</p>
Marking Requirements		
	Marking Requirements	Logo, markings and paint of BEVC to be approved by customer.
@Work pertaining to Wiring Infrastructure Prior to Distribution Box - Supply & Installation of Items for various activities on need basis depending upon site conditions.		
1	Electrical and Civil work	A. Supply & laying of cables of different 1100 Voltage Grade

@It is mandatory for the bidder to quote for these jobs in the Price Bid Sheet format provided for in the Tender, and to carry out these works, if, as and when authorized by Customer. Customer at its own discretion may or may not award this work pertaining to

Wiring Infrastructure Prior to Distribution Box.

1.1.11 Type testing

Sr. No	Criteria	Parameter	Clause No. of AIS Part 1
1	Safety functions Verification	Earth Presence Detection (Socket - EVSE)	6.4.1.1
		Earth Continuity Check (EVSE-EV)	6.4.1.2
		Over Current and Short- Circuit Protection	6.4.1.5
		Leakage Current (RCD)	6.4.1.6
		Dielectric withstand voltage	11.6.1
2	Mechanical Stability	Mechanical impact	11.11.2.2
		IP TESTING	11.11.2.4
3	Climatic environmental tests	Ambient air temperature	11.11.1.2
		Ambient humidity	11.11.1.4
4	EMC Verification	Immunity to electrostatic Discharges	11.11.3.2
		Supply voltage dips and interruptions.	11.11.3.2
		Fast transient bursts	11.11.3.2
		Voltage surges	11.11.3.2