Global Notice

for

Expression of Interest

for 500 KWh Battery Energy Storage System at CEL, Sahibabad

Central Electronics Limited
(A Government of India Enterprise)
4, Industrial Area,
Sahibabad - 201 010 (U.P.)
India

Central Electronics Limited (CEL), Sahibabad, (A Government of India Enterprise) is interested in **'Exploring the Worldwide Technological Advancements and Global availability of proven/promising product /systems for 500 KWh Battery Energy Storage System as per details given in the document".**

Firms who have experience/capability in manufacturing and supplying such products viz. Battery Energy Storage System are requested to see the complete details and document on CEL's website www.celindia.co.in.

For any clarification, Firms may contact

General Manager (Marketing)
Central Electronics Limited
(A Government of India Enterprise)
4, Industrial Area,
Sahibabad - 201 010 (U.P.)
India
Tel No.: +91-20–2895151/126
E-mail: spv@celsolar.com

The firms are requested to submit details in the prescribed format latest by **20-May-2016** (15:00 hrs) to

Assistant General Manager (MMD)
Central Electronics Limited
(A Government of India Enterprise)
4, Industrial Area,
Sahibabad - 201 010 (U.P.)
India

Pre Submission Meeting: Company or its authorized representatives are invited to attend the Pre-submission meeting for clarifications/feedback regarding subject EOI on 14.00:00 Hrs. (IST) dated 06-May-2016. Companies interested to participate in the aforesaid pre- submission meeting are requested to confirm their interest in writing to attend the aforesaid meeting at least two days prior to the date of meeting.

Firms expressing interest shall note that:

1. Technical details submitted for Battery Energy Storage System may mention the relevant values/ properties against the parameters described in the Technical requirements of this document.
2. Supply details submitted for proposed Battery Energy Storage System in last three years and in the current year may mention country wise the quantity of such system supplied.
3. It may please be noted that this EOI is only for the purpose of exploring the Worldwide Technological Advancements and Global availability of proven/ promising product /systems meeting stipulated Technical requirement with the objective of framing the technical requirements/ parameters.

ANNEXURE-A

Instructions/ Guidelines for the firms expressing their interest against Global Expression of Interest (EoI) for 500 KWh Battery Energy Storage System at CEL, Sahibabad

1. DISCLAIMER:

Central Electronics Limited reserves the right not to proceed with the process or at a later stage to change the process as per the requirements of Central Electronics Limited. It also reserves the right to decline to discuss the process further with any party expressing interest. This EoI shall not be considered in any way a proposal for procurement of Energy Storage System. The intending participants will furnish offer at their own cost and no claims, whatsoever, in this reference will be entertained by the CEL.

2. PURPOSE OF INVITING EoI:

The purpose of this Global EoI is to explore the Worldwide Technological Advancements and Global availability of proven/promising product /systems for 500 KWh Battery Energy Storage System.

The broad functional requirement for such a system is given in this document as Annexure 'C' or the proposed Battery Energy Storage System can also be submitted as per International Standards, giving details of specification and international standards followed worldwide.

The offers by the participants shall be evaluated on the eligibility criteria. Offers by the participants meeting the eligibility criteria shall be opened and evaluated. Participants meeting the eligibility criteria shall be short-listed. The shortlisted participants shall be asked to make a technical presentation. Further CEL may float a tender among the shortlisted participants to selected one vendor for supplying the solution.

3. GENERAL INSTRUCTIONS FOR SUBMITTING RESPONSE TO EOI:

3.1. Eligibility criteria

a) Firm should be an existing manufacturer / authorised supplier of Battery Energy Storage System. Authorised suppliers must submit the manufacturers' authorisation letter for participation in the EoI process.
b) The Battery Energy Storage System offered by the Firm should meet the functional requirements mentioned in this document (Annexure – 'C') or it should be as per International Standards.

3.2. General & Technical details to be provided by firm: General & technical details as per Annexure-C shall be submitted by the firm with their offer. The firm will be required to furnish supporting documents (such as lab reports, field reports etc.) to establish that they are meeting the laid down requirements.

3.3. The details submitted by the firm shall be scrutinized by CEL. The deficiency as observed in the offer during technical scrutiny or additional information as considered necessary will be advised to the firm. The additional information must be made available by firm within two weeks of advice.

3.4. Submission by firms: The intending firm shall ensure the submission in the format given in Annexure - B.

3.5. The respondents must furnish the application form & details **in duplicate** as required in the enclosed **"Format for Letter of Response"** at **Annexure-B** and details stipulated in **Annexure-C**. All pages of the documents should be signed with stamp.

3.6. The firm shall legally indemnify Central Electronics Limited against any possible claims/legal/other disputes at present or which may arise in future from any other party in connection with the intellectual property rights of the drawings and design or any other documents submitted by the firm or any other patent rights.

3.7. CEL reserves all the right of this exercise. In case of any doubt/dispute, decision of CEL shall be final.

ANNEXURE – B

FORMAT FOR LETTER OF RESPONSE

Respondents Ref No.:

Date:

Assistant General Manager (MMD)
Central Electronics Limited
(A Government of India Enterprise)
4, Industrial Area,
Sahibabad - 201 010 (U.P.)
India

Dear Sir,

Subject: RESPONSE TO – GLOBAL EOI FOR PARTICIPATION - 500 KWh Battery Energy Storage System at CEL, Sahibabad

1. We, the undersigned, offer the following information in response to the Expression of Interest sought by you vide your Notification No. dated
2. We are duly authorized to represent and act on behalf of _____ (hereinafter the "respondent")
3. We have examined and have no reservations to the EoI Document including Addenda No(s) _____.
4. We are attaching with this letter, the copies of original documents defining: -

   4.1. The Respondent's legal status;
   4.2. Its principal place of business;
   4.3. Its place of incorporation (if respondents are corporations); or its place of registration (if respondents are cooperative institutions, partnerships or individually owned firms);
   4.4. Self-certified financial statements of last three years, clearly indicating the financial turn over and net worth.
   4.5. Copies of any market research, business studies, feasibility reports etc. sponsored by the respondent, relevant to the project under consideration

5. We shall assist Central Electronics Limited and/or its authorized representatives to obtain further clarification from us, if needed.

   5.1. CEL and/or its authorized representatives may contact the following nodal persons for further information on any aspects of the Response

S. No.	Contact Name	Address	Telephone/Mobile	E Mail

6. This application is made in the full understanding that:

6.1. The EoI is only for exploring Worldwide Technological advancements and Global availability of proven/promising product /systems for 500 KWh Battery Energy Storage System at CEL, Sahibabad and may not be for the procurement or short-listing of Firms.
6.2. Information furnished in response to EoI shall be used confidentially by CEL as required. Confidentiality of the information furnished by the firm in this EoI will be maintained by CEL.
6.3. CEL reserves the right to consider or not to consider any or all applications, cancel the EoI without any obligation to inform the respondent about the grounds of same.

7. In response to the EoI, we hereby submit the following details annexed to this application –
7.1. Turn-over of the firm during the last three financial years with the copies of annual report.
7.2. Details of customer(s) where Energy Storage System have been supplied by the firm including quantity during last 3 years.
7.3. Experience and expertise for the Energy Storage System.
7.4. Details of Intellectual Property Rights (IPR) held, patent filed/held and MoU/ agreement signed.
7.5. Details of ISO/equivalent certification, if any.
7.6. Documents in proof of Eligibility criteria
7.7. Para-wise compliance of Requirements as per Annexure-C and supporting documents.

8. The undersigned declare that the statements made and the information provided in the duly completed application are complete, true, and correct in every detail.

Yours sincerely,
(Sign)

NAME:
In the Capacity of duly authorized to sign the response for and on behalf of

Date:

ANNEXURE – C

SALIENT TECHNICAL AND FUNCTIONAL REQUIREMENTS FOR BATTERY ENERGY STORAGE SYSTEM (BESS)

Definitions:

Solid State Battery - Means a type of Energy Storage Facility which stores energy by having all chemical components contained within the electrochemical cell and the energy is stored exclusively as the electrode material having both solid electrodes and solid electrolytes.

Unit battery – A unit battery is the minimum field-replaceable stored energy component or assembly. A unit battery may consist of one or more electrochemical cells, electrically interconnected in any series and/or series–parallel configuration. A unit battery has one (and not more than one) set of positive and negative terminals, by which it is interconnected with the rest of the storage system.

ESS - Energy storage system (ESS) based on commercially available electrochemical storage solutions, capable of receiving, storing and delivering electrical energy at specified rate(s) suitable for grid support applications. It comprises of unit batteries, battery management system (BMS), auxiliaries.

BMS - Battery Management System (BMS) is any electronic system that manages a rechargeable battery (cell or battery pack), including protecting the battery from operating outside its Safe Operating Area, monitoring its state, calculating secondary data, reporting that data, controlling its environment, authenticating it and / or balancing it.

Ramp Rate - The rate at which a power plant can increase or decrease output.

Site-Specific Implementation Requirements:

Item Description	Requirement
Battery Technology	Solid State
Rated energy capacity	500kWh
Rated No of Cycles (Minimum)	Minimum 5000 cycles at rated energy capacity at 80% Depth of Discharge (DoD)
Peak management (PM)	Yes Morning and evening (preference to evening) No. of days per year: 365
Use case requirements	Peak Shift and Peak management
VAR compensation /voltage support (VC/VS)	Yes
Frequency regulation (FR)	Yes
Intermittent resource support (IRS)	Yes
Electrical infrastructure: AC system interconnection requirement at Point	415Vac, 50 Hz 3 phase, wye or delta

of Connection (PCC)	3-wire or 4-wire
Electrical infrastructure: expected variations at PCC in voltage, frequency, and phase imbalance	Voltage: ±15% Frequency, 49.5 to 50.2 Hz Phase Imbalance: ±3%
System ac-dc-ac efficiency Peak management use case Frequency regulation use case	 90% 85%
Ramp rates	500kW/min

- The ESS shall be capable of operating over its entire life in one or more of the use cases:
  i) Peak management (PM)
  ii) VAR compensation /voltage support (VC/VS)
  iii) Frequency regulation (FR)
  iv) Intermittent resource support (IRS)

- **Requirements for Intermittent Resource Support (IRS) Use Case:**

Intermittent Resource Support Use Case	Requirement
Voltage flicker compensation	Yes Compensate for all changes in intermittent resource output power level that exceed 10% per second and in which the new power level remains for at least 5 seconds. The Maximum system Power level for Voltage flicker compensation during discharging and charging to be determined during detailed system design in terms of % of nameplate watt and VAR rating.
Ramp rate control (Power level of the ESS shall decrease at a linear rate)	500kW/min Maximum ESS power level for charging and discharging to be determined at the time of detailed system design in terms of % of nameplate watt and VAR rating.
Intermittent Resource Support	The ESS will support the integration of intermittent resources (solar) into the grid by either eliminating or reducing undesirable voltage and power fluctuations or by firming the power delivered by the resource

- **Design Life:** The ESS shall have a twenty-five (25) year design life—that is, the system is capable of providing the all the capabilities described in the specification for twenty- five years from the initial commissioning of the ESS. When the system is no longer able to provide these requirements, the system has reached its end of life.

- **Control System Requirements:** The control system shall be designed to provide for automatic, unattended operation of the ESS in all of the use cases described. The control system design shall provide for local manual operation and remote operation or dispatch from a remotely located computer or Owner's operation centre. The control system shall be programmable for establishing or adjusting all parameters, set points, algorithms, limits, and so on that are required for effective operation in any of

the use cases described in this specification. The control system shall use these controls for an orderly and safe shutdown, even in the absence of utility power. The control system shall also use these controls for an orderly start-up sequence, which shall provide for a safe system reset from any standby or operating condition so that the unit goes through a normal start-up sequence in the same way it would when being powered up after loss of power or being in a shutdown state. For all system-generated alarms, the control system shall provide for the resetting of those alarms. This function is intended for alarms that, after they are set (for example, by a fault condition, as listed above and elsewhere in this specification), must be cleared by operator intervention to allow normal operation to be restored. The control system shall provide for modification of various set points and fixed operation/control settings associated with the various control functions.

- **Performance Monitoring and Data Acquisition:** The ESS shall include a (Data Acquisition System) DAS to provide continuous monitoring and display of key operational parameters, as well as permanent archival of all measured parameters. The DAS shall include sensors, transducers, wiring, signal isolation and conditioning circuitry, and data acquisition and analysis hardware and software as required to perform the functions described in this section. The DAS shall be of standard commercial manufacture and shall use hardened components. The DAS shall measure operational data, as described in this section, and shall record all data points to fixed and removable non-volatile memory.

- **Grounding:** A suitable equipment grounding system shall be designed and installed for the ESS. This system shall be designed to be tied to an existing site grounding system. The system also shall be adequate for the detection and clearing of ground faults. All exposed non-current-carrying metal parts shall be solidly grounded. Particular attention shall be given to prevention of corrosion at the connection of dissimilar materials such as aluminium and steel.

- **Standards & Statutory Requirements:** The ESS and other equipment should conform to the relevant International / Indian Standards and shall meet all the CEA/CEIG and local statutory requirements. The Bidder shall furnish the standards adopted by them. As a minimum, the following standards shall be complied with:

  IEC 61427: Secondary cells and batteries
  IEC 62619: Safety requirements for large scale industrial applications (for lithium cells)
  IEC 62281 (for Lithium Ion battery): Safety of primary and secondary lithium cells and batteries during transport
  UL1973 and **UL9540** certification: For battery safety testing or field evaluation to ensure compliance with IEC 62485-2, 61508, 60812 (if applicable)

- **Warranty:** The Contractor shall provide a warranty for the entire ESS and its constituent equipment. The Contractor shall provide an unconditional, five (5) -year parts and labour warranty on all equipment, including the battery. Warranty replacement shall be required for individual unit batteries that degrade in performance to the point at which the ESS cannot meet the requirements specified in this

specification and/or for unit batteries that materially degrade the availability, reliability, safety, or functionality of the ESS. The warranty shall guarantee the availability of battery replacements delivered to the site within 2 weeks of notification during the battery warranty period.