

Tender for Design, Supply, Testing, and Installation & Commissioning along-with Comprehensive Annual Maintenance Contract (CAMC) for 5 years of Battery Energy Storage Systems (BESS) on Turnkey Basis under UI-ASSIST initiative with BRPL in NCT of Delhi

TERI/MAT/2019-20/002

Tender Date: 16-12-2019

Due Date for Submission of Bids: 21-01-2020

Corrigendum/Addendum No.2

Tender Notice

The Energy & Resources Institute (TERI)

6C, Darbari Seth Block,

India Habitat Centre, Lodhi Road, New Delhi – 110003

TERI invites bids from prospective bidders through tendering for **planning, design, engineering, and transportation to site, insurance, supply at site, un-loading, handling, installation, integration, testing, commissioning & demonstration and comprehensive AMC for acceptance of all equipment/ materials and miscellaneous items required for completing the BESS installation**, as per the details given in tender document.

Refer to page no. 3, Part 1: General Information, Table 1: Particulars of Items: Earnest Money Deposit – **“Bidder has to submit single EMD in the form of demand draft despite bidding in different categories and technologies”**.

Refer to page no.3, Table 2: Last date for submission of technical bid and financial bid response has been extended to 21.01.2020; 1600 Hrs.

Refer to page no 3, Table 2 has to be read as below, remaining clauses remain the same:

Sr. No.	Milestone	Date and time (dd-mm-yyyy; hh:mm)
6	Last date for submission of technical bid and financial bid response	21.01.2020; 5:00 PM
7	Opening of technical bid	22.01.2020; 11:00AM
8	Technical Presentation by the shortlisted bidders (presentation should be shared at least two days before the presentation date)	27.01.2020; 4:00PM
9	Declaration of shortlisted firms on the basis of technical evaluation will be published on TERI/ UI-ASSIST official websites	03.02.2020; 11:00AM

Refer to page no.4, Part 1: General Information, last clause has been amended as **“The bidders need to submit the cost of the bid document and the EMD as stated above in the table through Demand Draft as bid document fees and as EMD in favor of The Energy and Resources Institute (TERI), payable at Delhi. MSME’s are exempted from payment of earnest money deposit but they have to submit the Original Notarized copy of MSME registration. Bidder has to provide the details like- Name of MSME Registering Body, MSME Registration no. (with copy of registration). TERI reserves the right to reject any or all tenders without assigning any reason thereof. The decision of TERI will be final and binding on all matters with respect to this tender”**.

Refer to page no.5, Table 3: please read annexure V as **“Valid CPRI/ ERDA/ equivalent international laboratory type test certificate of offered battery storage system and PCS by Bidder during detailed engineering stage after award of Contract.**

(Test certificate should have been issued on or, before 13-12-2019)

Number of certificates:

Certificate for any one of the above

Certificate for any two or, more of the above”

Refer to page no.5, Table 3: annexure VIII has been added as **“The bidder has ISO 9001:2015 certification/ ISO 14001:2015 certification/ OHSAS 18001:2007 / ISO 45001:2018”**.

Refer to page no. 9, Local Conditions: Point no. 1.2.1 has been changed as **“Bidders eligible for bidding: Bidding is open to bidders having office(s) in Employer’s (TERI) country. Consortium up-to two firms/organizations as partners is allowed.”**

Refer to page no. 11, Section 2: Eligibility Conditions, point no. III has been changed as **“The bidder should have minimum two years of experience in executing contract of grid interactive BESS (viz. supplied/commissioned/running) across the globe. Purchase Order/ Completion Certificate of past five years should be enclosed”**.

Refer to page no. 11, Section 2: Eligibility Conditions, point no. VI has been changed as **“The Bidder having installed & operationalized the grid interactive battery energy storage system(s) of cumulative installed capacity of 125 kW for 2 hours or higher, out of which at least one grid interactive battery energy storage system should be of 30 kW for 2 hours capacity or, higher (in India or globally). Certificate issued by the Employer/ Client certifying the operation without any adverse remark along-with copy of purchase order prior to the date of techno-economic bid opening, shall be provided.”**

Refer to page no. 11, Section 2: Eligibility Conditions, point no. VIII has been added as **“Consortium up-to two firms/organizations as partners is allowed. Project execution will be the responsibility of lead bidder which will remain the point of contact for all queries and will be held liable for all the discrepancies in project execution in line with this tender.**

Eligibility: In case of consortium, lead bidders credentials will only be considered for eligibility criterion.”

Refer to page no 11, Section 2: Eligibility Conditions point no IX has been added as: **“Bidders are not allowed to use the technical credentials of their Parent /subsidiary company”**

Refer to page no. 12, Word “. **Other Eligibility Conditions”** has been changed with **“Evaluation Criterion”**.

Refer to page no. 12, please read table no. 5 as given below.

Sr. No.	Criteria for Single Bidder	Criteria for Consortium	Point/ Marks
1	Bidder’s experience as a prime contractor for Supply, installation, Commissioning and maintenance of Lithium/advanced lead acid/Lead Acid based BESS in past five years along with Purchase order and Completion certificate from central / State Government Agencies / PSU / Private firms Up-to 350 kWh (min 250 kWh) Up-to 500 kWh Up-to 650 kWh Up-to or More than 800 kWh	Bidder’s experience as a prime contractor for Supply, installation, Commissioning and maintenance of Lithium/advanced lead acid/Lead Acid based BESS in past five years along with Purchase order and Completion certificate from central / State Government Agencies / PSU / Private firms Up-to 450 kWh (min 250 kWh) Up-to 600 kWh Up-to 750 kWh Up-to or More than 900 kWh	10 15 20 25 (Maximum)
	OR		
1	Bidder’s cumulative experience as sub-contractor for installation, Commissioning and maintenance of Lithium/advanced lead acid/Lead Acid based BESS in past five years along with Purchase order and Completion certificate from central / State Government Agencies / PSU / Private firms Up-to 350 kWh (min 250 kWh) Up-to 500 kWh Up-to 650 kWh Up-to or More than 800 kWh	Bidder’s experience as a prime contractor for Supply, installation, Commissioning and maintenance of Lithium/advanced lead acid/Lead Acid based BESS in past five years along with Purchase order and Completion certificate from central / State Government Agencies / PSU / Private firms Up-to 450 kWh (min 250 kWh) Up-to 600 kWh Up-to 750 kWh Up-to or More than 900 kWh	10 15 20 25 (Maximum)
	<ul style="list-style-type: none"> ▪ Experience of installing, operating and managing Energy Management System (EMS) alongside execution of projects relevant to applications as mentioned in Part-4 of tender document. ▪ Log-keeping and analytics of electrical parameters (number and type) which has been accessed through EMS portal, sampling & recording time ▪ Interoperability through Communication protocols used between SCADA & EMS in executed projects and between various RTUs/on-field measurement devices and control center considering the physical 		15

	distance.	
3	<p>Bidders will also make a techno-economic presentation of BESS (offered in the bid) to the officials of BRPL and TERI. Presentation must include brief about following points:</p> <ul style="list-style-type: none"> ▪ Brief overview of the projects mentioned above under points #1 and #2, covering BESS sizing & control algorithm, disposal plan, safety etc. ▪ Introduction to technology and associated equipment such as PCS, Battery cell/modules, Spare parts etc. (with specifications) ▪ Brief features and description of BESS (including EMS), degradation and auxiliary consumption of proposed BESS solution in the bid. ▪ Bill of quantities (no cost to be mentioned, only equipment) ▪ Suitability of the technology characteristics for applications mentioned in the tender document ▪ Brief overview of major terms & conditions of the contract (if selected) ▪ Techno-economic analysis indicating economics of BESS offered in bid. ▪ Any other information bidder desires to provide <p>More information may be requested from the bidder for evaluation purpose, if required. Bidders have to provide the information as and when requested.</p>	30
4	Financial evaluation shall be carried out on the basis of total BESS cost for supply, installation, commissioning and maintenance, total cost of BESS/ total throughput of BESS. as per technical characteristics as mentioned in table 7 and table 8	30
5	In-kind contribution in R&D activity and in-kind offering.	Preferred

Refer to page no. 12; brief of **NOTE** has been changed as **“In case of same score obtained, highest technical score obtained will be given preference”**.

Refer to page no 14, point no 3.3.2.1 (ii) Variation in taxes, duties & levies, has been amended as **“Any variation and introduction of any new taxes, duties, statutory levies will only be accepted by TERI. ESI/PF has to be borne by the contractor.”**

Refer to page no 17, point no 4.1.4, **“only technical bid has to be submitted in UBS drive”**.

Refer to page no.18; point no 5.1 to be read as **“Opening and Evaluation of Tender”**.

Refer to page no. 18, point no 5.1.1 has been added as **“Evaluation will be carried out as per table no. 5 - Detailed evaluation criteria and scheme of evaluation”**, rest of the points remain the same .

Refer to page no.19, point no. 6.1: has been amended as **“Finalization of Bid:**

- **The bidders shall submit bids category wise. Each bidder can bid for multiple technologies as allowed for each category as mentioned in table-6: category wise BESS descriptions for all three sites. For example, a bidder bidding under category B can submit three different bids for NMC, LFP and LTO. The most suitable technology during evaluation will be selected by TERI. TERI’s decision in this regard shall be final and binding. Bids other than aforementioned suitable technology will be discarded and evaluation will be done among bids under same**

technology. First the Technical bids shall be opened and evaluated. Technical bids will be evaluated as per table- 5 up-to step three. The bidders scoring at least seventy percent marks of the maximum technical score will be considered technically qualified.

Then the price bid of technically qualified bidders shall be opened”.

Refer to page no.19, point no. 6.2: has been amended as “Financial bids will be evaluated as per table-5 as mentioned in step four.

- The bidder obtaining with the highest marks (technical + financial) will be the L1 bidder. In case two bidders score equal marks, bidder with higher technical score will be given preference. ”.
- Separate Purchase orders will be released for different sites.

In the same clause 6.2, Two points has been removed which are as mentioned below:

The lowest rate (i.e. L-1) received (and in turn approved by the competent authority) would be the ‘Approved Rate’.

Approved lowest rate (L-1) would be offered to those lowest Bidders (i.e. L-2, L-3 and so on) having price not more than 15% of lowest approved rates (L-1) and will be empanelled and awarded as per the discretion of TERI & BRPL, remaining of total bid quantity or as per his capacity given in the bid, whichever is lower.

Refer to page no.19, point no. 6.4: please read it as “TERI reserves the right at the time of awarding the contract to increase or decrease the quantity of goods and similar locations of supply without any change in price or other terms and conditions within permissible range of $\pm 5\%$ of the bid capacity”.

Refer to page no. 21, Part 3: General conditions of contract, point no. 1.1: please read it as “TERI shall select the successful Bidder (s) on the basis of techno commercial after verifying their capacity. The Project shall be executed by TERI. The successful Bidder(s) shall have to sign the contract with TERI”

Refer to page no. 24, point no. 11.2.2, has been changed as “The bidder to guarantee the materials / items supplied against any defect of failure, which arise due to faulty materials, workmanship or design for the entire defects liability period. The Defect liability period shall be 12 months and warranty of 12 months from the date of commissioning followed by the comprehensive AMC period of be 5 (five) years for complete system including battery after 12 months from the date of commissioning and handing over of the system or total throughput mentioned in the bid whichever is first. If during the defects liability period any materials / items are found to be defective, these shall be replaced or rectified by the bidder at his own cost within 30 days from the date of receipt of intimation. TERI may also invoke performance/security bank guarantee if any identified defects are not replaced or rectified by the bidder at his own cost within 30 days from the date of receipt of intimation. After completion of 5 years of installation due to ageing, available capacity shall not go below 95% of available capacity specified at the time of bidding. Annual expected throughputs with $\pm 10\%$ permissible range are as mentioned in table 7 and table 8. Bidders are requested to propose degradation against estimated annual throughput in the technical presentation.”

Refer to page no. 31, under Materials -Quality& Workmanship, point no.9:please read it as: **“In order to ensure efficient and flawless running of the system, there should be a dedicated skilled person to take care of system working at each site (Category A, B & C). The dedicated personal must be ITI electrical and must have at least one year of experience. Separate component of CAPEX should be included in the financial Bid part for this workmanship.”**

Refer to page no. 32, Part -4 Scope of Work & Technical Specifications – Category - C, **“four”** has been amended as **“five”**.

Refer to page no. 32, **Table 6:** Category-wise BESS descriptions for all 3 sites – has been amended as below and rest of the points remain the same:

	Location	Application	Useful Capacity of BESS at the Beginning of Life	Battery Chemistry	Designed Rating of BESS
Cat-C	TERI-SAS, VasantKunj Institutional Area, New Delhi	Savings on TOD price difference (primary application)	60 kWh/ 30 kW	Li-Ion (NMC/ LFP)	Technology Dependent

Refer to page no 35, **Delivery of materials: This has been extended to 3 months / 12 weeks.**

Refer to page no 35, **Delivery time for installation and commissioning: This has been extended to 4 months / 16 weeks. (Please note complete project has to be completed within 7 months)**

Refer to page no.36, Table 7: Technical characteristics of BESS for Category A, below points has been changed and rest of the points remain the same:

Sr. No.	Parameters	Unit	Value
4	Throughput	kWh	At-least 6,90,000 kWh of total throughput in case of Advanced Lead Acid and 9,20,000 kWh of total throughput for Li-Ion at rated DoD
6	Service Life	Years	At-least 6 years or, total throughput mentioned whichever is less
8	Annual throughput ($\pm 10\%$ permissible range)	kWh	2,000 kWh

Refer to page no.36, point II, “**as applicable**” has been added after the words “**category b & C**”.

Refer to page no.36, Table 8: please read it as “**Technical characteristics of BESS for Category B** & Category C**” and this clause has been added as “**** LTO is applicable only for category B**”.

Refer to page no.36, Table 8: below points has been changed and rest of the point’s remains the same:

Sr. No.	Parameters	Unit	Value
4	Throughput	kWh	4,80,000 kWh of total throughput for NMC & LFP. 12,00,000 kWh of total throughput for LTO at rated DOD
6	Service Life (for category B)	Years	At least 6 years or 4,80,000 kWh of total throughput for NMC & LFP. 12,00,000 kWh of total throughput for LTO whichever is less at rated DOD
7	Service Life (for category C)	Years	At least 6 years or 2, 00,000 kWh of total throughput for NMC & LFP at rated DOD.
9	Annual throughput (±10% permissible range)	kWh	3,600 kWh for category B and 9,000 kWh for category C

Refer to page no.37; Category B has been defined as “**BESS shall supply the power to common/critical load during power outage event. The system shall monitor the grid parameters (voltage, current, frequency, power factor etc.) and total load demand during power outages. The system shall be able to discharge with 2C rate and it shall also be synchronized with DG set in such a manner that it should not back feed the power to DG. When the BESS is discharged completely during power outages then the power to the load shall be supplied through the DG set for remaining duration. The charging of battery storage system shall be performed through grid power supply. Grid power, common/critical load demand and battery capacity will be monitored continuously and whenever power failure occurs, BESS shall supply the power to load as per equation (5) and (6) expressed in annexure-II. In-addition, BESS must have feature to supply the power to the load in grid-connected mode when utility observes the peak demand. Therefore, bidder must install a hybrid system (PCS) which can be operated in both off grid as well as grid connected mode. Although, the aforementioned application of grid-connected operation of BESS is not a primary application as of now however it can be implemented in future**”.

Refer to page no 37 & 38, under the clause The Battery Energy Management System (EMS) architecture shall comply with following requirements, few points has been changed and amended as mentioned below:

- **BESS should have the capability to monitor the operational parameters of grid and BESS (Grid V & I, P, Q, f, battery V & I, State of Charge, relay/actuator command etc.) remotely in SCADA system through communication interface. In-addition, BESS operation shall be controlled through utility’s SCADA center.**

- The sampling time for recording of the parameters shall be adjustable up to 100 ms. The real-time analogue data such as grid voltage & current, battery voltage & current, SoC, frequency etc. shall be recorded with adjustable interval time of 10-60 second and digital data such as alarm, events will be stored for 30 days.
- Module-level battery management system shall be provided to take care of battery module's parameters (voltage, SoC and temperature) within specified range as per the requirement of battery technology. Additionally, BMS must have feature to monitor the cell level parameters as well.
- EMS of BESS for each category shall be designed in such a way that it could be interfaced with existing SCADA system of the utility. The field status of key operational parameters must be communicated to SCADA center of the distribution utility through Modbus communication and it shall have feature to control the system from SCADA center. In addition, the bidder shall also create local control station to monitor & control the system operation locally from an industrial computer/PC as well as through a smart phone application based on android or IOS.

Refer to page no 38, under the clause The Battery Energy Management System (EMS) architecture shall comply with following requirements, this point has been removed **“Cell-level battery management system shall be provided to take care of cell parameters (voltage, SoC and temperature) within specified range as per the requirement of battery technology”**.

Refer to page no 39, for System Hardware Requirements, words **‘Processor and RAM’** has been changed as **‘Processor, RAM and Storage’**.

Refer to page no 39, for Monitoring: words **“and throughput”** has been added after the words **“cumulative number of cycles”**.

Refer to page no 39, for Charge Control, word **‘PCS’** has been changed with **‘EMS’**.

Refer to page no 40, for Operation Mode, sentence **‘PCS must have isolation transformer (inbuilt shall be preferred) to disconnect the system from grid in case of any hazardous situation.’** has been replaced with **‘PCS must have isolation transformer (inbuilt shall be preferred) to disconnect the system from grid in case of any hazardous situation’**.

Refer to page no 40, for Auxiliary power supply: a sentence has been added **“Auxiliary consumption has to be mentioned under technical bid for each of the proposed battery technologies and same has to be included in technical presentation as well.”**

Refer to page no 40, under Enclosures; **‘IP-54’** has been replaced with **‘IP-42’**.

Refer to page no.40, **Table 9: Detailed** description of PCS/ PCU – has been amended as below, rest of the points remain the same:

Sr. No.	Parameters	Unit	Value
1	Maximum power rating	kVA	140 (Category A) 270 (Category B) 56 (Category C)
	Power rating	kW	125 (Category A) 240 (Category B) 50 (Category C)

- Refer to page no 41, Design and Construction Requirements; first point has been amended as **“BESS system will be inter-connected with grid at secondary terminal of distribution transformer i.e. three-phase four-wire, 433 Volts (L-L) at point of common coupling (PCC). The above mentioned inter-connection point is suggested for category-A & category-C application. However, probable inter-connection point of BESS for category-B will be at 3-phase output of DG set. However, it may further change slightly after the site visit to installation site. The single line diagram (SLD) of all the three categories is given in annexure IV, V & VI. In-addition, the appropriate location for BESS inter-connection shall be proposed by the bidders and further it shall be approved by TERI/BRPL”.**

Refer to page no. 41, Table 10: National/ International Standards for Battery Energy Storage System – has been amended as below, rest of the points remain the same

Requirements	Standards
Performance tests, designations, markings, dimensions and other requirements	IEC 62619/62620
Protection of Stationary Battery Systems	IEEE 1375
Design, Operation & Maintenance of BESS	IEEE 2030.2.1-2019 or equivalent
Guide for Selection and Use of BMS in Stationary Applications	IEEE 1491

Refer to page no 43, **Table 11:** please read it as: **“National/ International Standards related to operation & safety of PCS/ PCU, testing procedures and protection devices”.**

Refer to page no 43, under Fire Fighting System, words **“or NFPA 72.A”** has been added after **“IEC 62897 (for Li-ion)”**.

Refer to page no 45, Special Tools and Mandatory Spares, second para has been amended as **“In-addition, battery modules of capacity 5 kWh of lithium-ion (NMC/ LFP/ LTO or advanced led acid) shall also be provided as spare items, 3 kWh under category B and 2 kWh of category C for the technology as mentioned in bid. The same will be used for research purpose and placed in TERI’s Smart Control Laboratory at TERI Gram, GualPahari, Gurugram, Haryana.”**

Refer to page no 45, scope of work for AMC has been added as **“Scope of AMC work**

1. Bidder shall perform standard annual maintenance and augment the system as needed to meet performance guarantee in all aspects.
2. Bidder shall perform standard annual maintenance of BESS that would include wear, tear, overhauling, insurance, and replacement of defective cells, PCUs, spares, consumables and other parts including sensors and data acquisition equipment installed to communicate parameters to EMS and between EMS and SCADA.
3. Monitoring of BESS performance and supply of all technical, production/operation data and information and making it available as and when required.
4. Responsible to carry out routine and preventive maintenance and replacement of component/equipment of BESS in case of failure and bidder shall provide all labor, material, consumables etc. for routine and preventive maintenance at regular intervals. This will also include scheduled software maintenance, HVAC cleaning, battery container cleaning, low voltage side circuit breaker maintenance, fire suppression system maintenance etc.
5. Carryout maintenance activities as a result of sudden failure/breakdown of any particular component or equipment. Bidder shall be responsible to carry out breakdown maintenance of each and every component of BESS.
6. Visit to onsite on call basis to provide maintenance services within 12 hours of raising the complaint.
7. Emergency trouble shooting calls - within 12 Hrs. including spare arrangements.
8. On site repairing/component replacement - within 7 days, however, system has to be in service utilizing the spares within 12 hours of the breakdown
9. Bidder shall maintain stock of mandatory spares required for warranty and AMC period for any emergency troubleshooting. In any case system should be in running condition within 12 hours of break-down.
10. Bidder shall keep one technically skilled person employed dedicatedly to three sites as mentioned in the tender.
11. Payment of AMC charges shall be linked with uptime (availability) of BESS. BESS is more significant during peak times of BRPL, thus, weightage of penalty will be higher during peak-time slots as per the latest tariff orders of BRPL. The detailed formula shall be decided on mutual consensus at the time of final AMC contract.
12. The vendor has to submit year-wise Comprehensive AMC cost for 5 years after completion of 1 year warranty period, however, the penalty on account of non-availability of the BESS shall be calculated on monthly basis. The net balance (AMC contract annual price – penalty) will be released annually to the contractor. Frequency of payments shall be decided on mutual consensus at the time of final AMC contract.
13. Sub-Contracting: No sub-contracting of work in full or in part is allowed unless approved by TERI in writing.”

Refer to page no 46 & 47, Table: 13 Descriptions of BESS for technical bid, few changes has been made which are as tabulated below:

Sl. No.	Description	To be Furnished by the Tenderer
A	Battery	
7	Life cycle of battery and Throughput	

13	Auxiliary consumption	
14	Annual degradation	
G	Past Experience of Energy Management System (EMS) & Battery Management System	
1	List of executed project for relevant application(s) of BESS (similar to applications specified in this tender document)	
	Project details (size and components of BESS)	
2	Details of EMS & BMS	
	Specific parameters (number & name) accessed on EMS portal	
	Detail feature of BMS (accessed parameters)	
	Communication protocol used to interface EMS with SCADA, if any	
	Distance between site of BESS and SCADA center wherein EMS has been linked	
	Recording and sampling time interval	

***Bill of quantity (rate column has to be left blank) to be shared along with technical bid which should include name, quantity, technical specifications of all the components of BESS. Separate bids can be submitted if bidder is bidding for multiple technologies under single category.**

Refer to page no 48/49, **Part 6: Financial Bid, Table 14 heading to be read as “Descriptions of BESS for financial bid (Separate bids can be submitted if bidder is bidding for multiple technologies under single category)”**.

Single Line Diagram of Category A, B and C are as Annexure IV, V and VI.

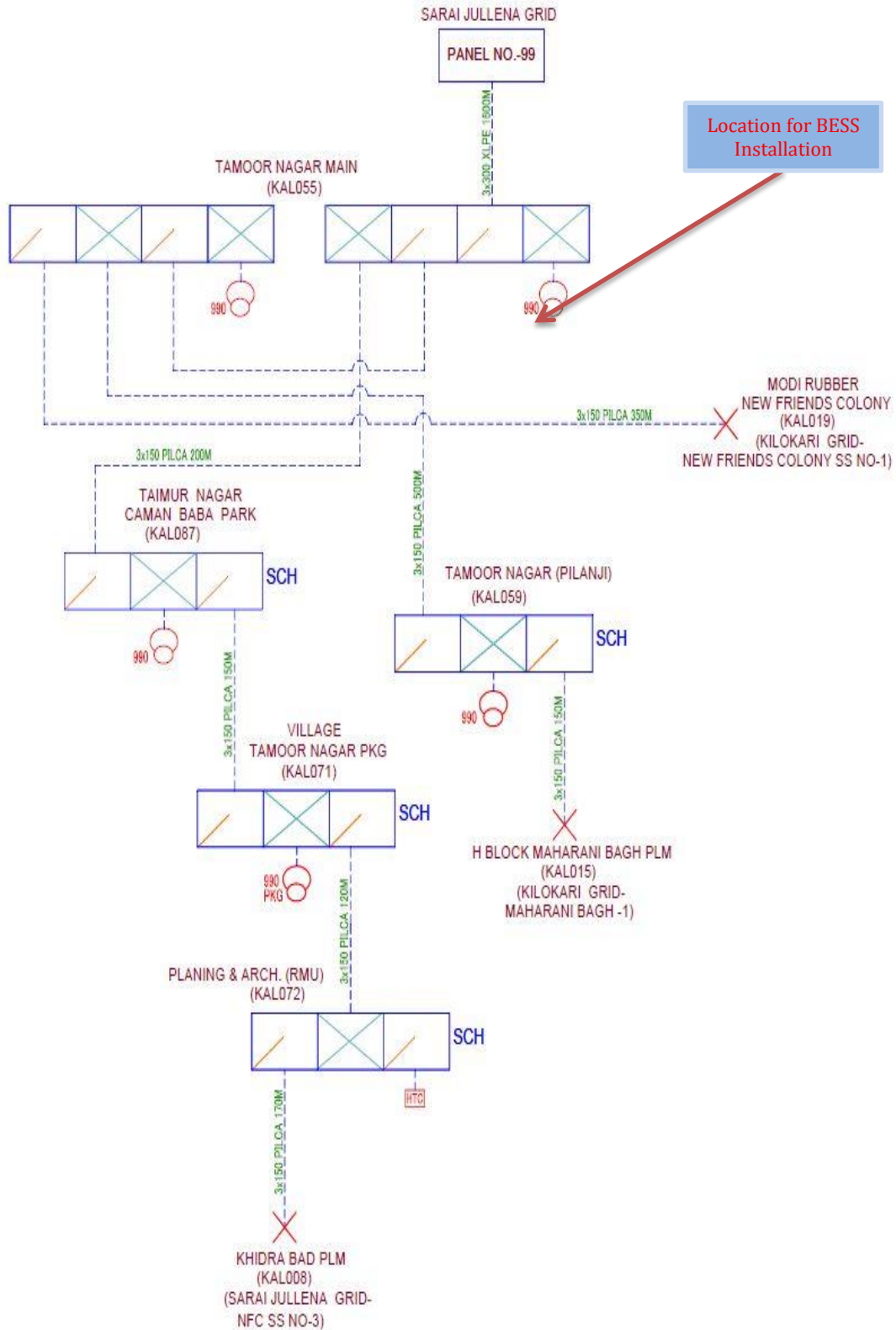
Refer to page no 48/49, table of financial bid as mentioned below:

Sl	Description	HSN Code	Total Cost of BESS (Li-ion)*	Total Cost of BESS (Lead-acid)*	GST - Hardware	GST - I& C	GST - AMC	Per unit throughput (INR/kWh)	Per cycle cost** (INR/Cycle)	Net Amount (INR)	
1	Cat A - 990 kVA DT in Taimoor Nagar, New Friends Colony										
A	Cat A – Supply, installation and commissioning										
B	Cat A - Comprehensive maintenance charges for five years										
2	Cat B - Dwarka (Ispatika Apartments, Dwarka)										
A	Cat B -Supply Installation and commissioning										
B	Cat B - Comprehensive maintenance charges for five years										
3	CAT C - TERI-SAS, Vasant Kunj Institutional Area										
A	Cat C – Supply, Installation and commissioning										
B	Cat C - Comprehensive maintenance charges for five years										
	Total Amount (in figures and words) for Cat A										
	Total Amount (in figures and words) for Cat B										
	Total Amount (in figures and words) for Cat C										

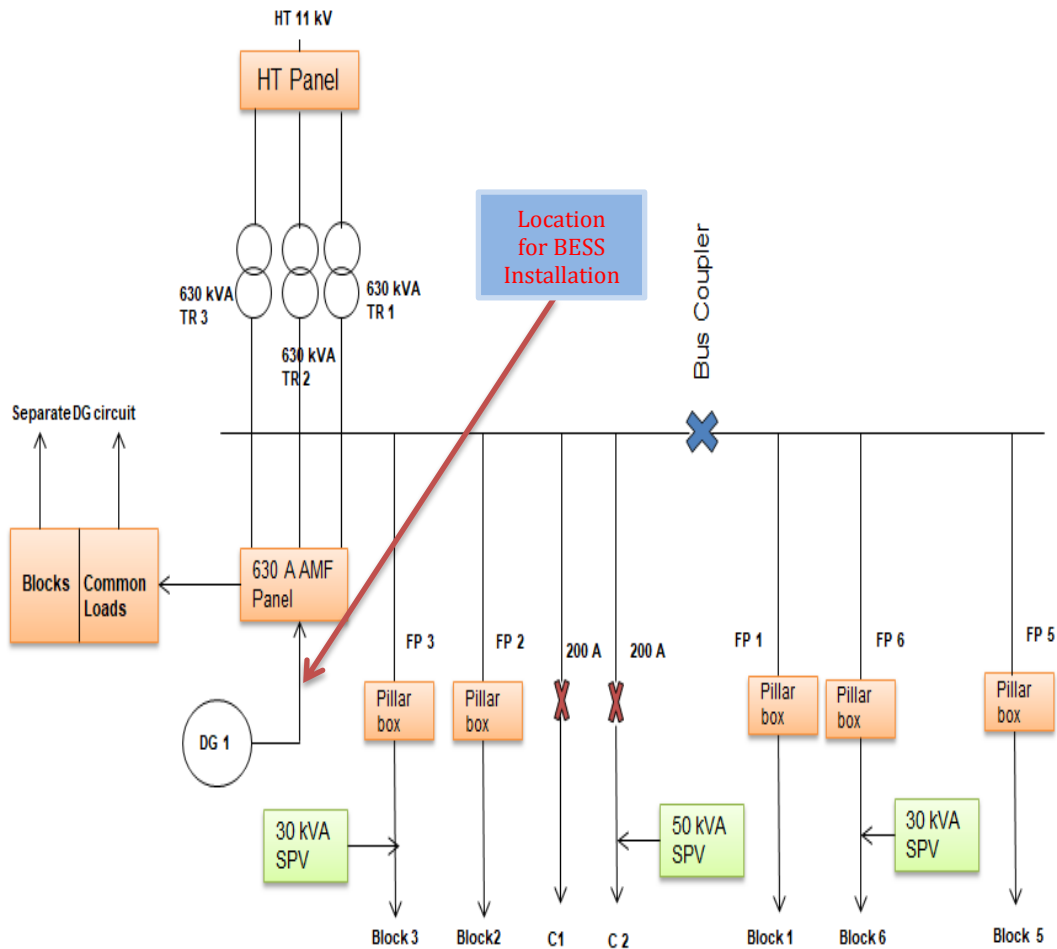
*Component-wise cost break-up to be shared along with financial bid with GST separately mentioned in against each component

** **Optional**

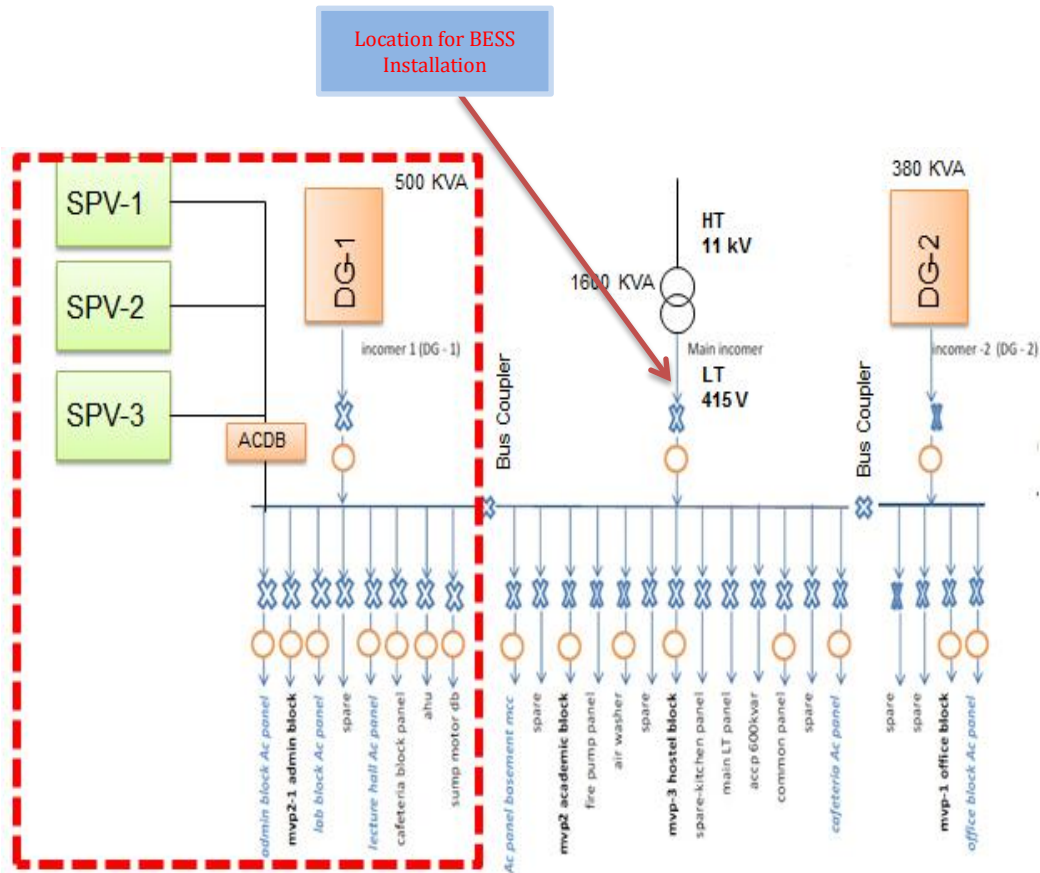
Annexure IV: Single Line Diagram of Category A



Annexure V: Single Line Diagram of Category B



Annexure VI: Single Line Diagram of Category C



Queries reply are as below:

<u>Sl.No</u>	<u>Section</u>	<u>Clause</u>	<u>Description as per Tender Specification</u>	<u>Client reply</u>
1	Part 2: Instruction to Bidders & Section 1: Contents of the Tender Document	Clause 1.2.2 / Page 9	Further the purchaser has the rights to get sample of Li-Ion/Advanced Lead Acid Battery Bank tested by any reputed independent test lab (approved by TERI/BRPL) at the cost of bidder	This has to be borne by the bidder
2	Part 4: Scope of Work & Technical Specification	Battery Energy Management System Category A / Page 36	Battery storage shall discharge based on battery capacity and real-time loading of DT..... The reference value shall be updated periodically (interval time will be decided in consultation with system integrator) depending upon the electrical parameter measurement	Bidder has to install a separate energy meters (voltage & current sensors) for sensing the power flow through the grid. We can not rely on existing meters of utility in any of the category since these meters are not reliable enough in controlling of BESS.
3	Part 4: Scope of Work & Technical Specification	Battery Energy Management System Category B / Page 37	Bidder shall supply the power to common/critical load during power outage event. The system shall monitor the grid parameters (voltage, current, frequency, power factor, etc.,) and total load demand during power outages	No, utility has access of only parameters of HT side (11 kV) through SCADA system. The sensing device shall be installed by bidder and EMS shall be communicated with SCADA through Mod Bus.
4	Part 4: Scope of Work & Technical Specification	Battery Energy Management System Category B / Page 37	...It shall also be synchronized with DG set in such a manner that it should not back feed the power to DG	Slight modification of existing configuration would be required such as grid isolation must be provided in cat B along side parallel sensing from BESS to contactor of housing load (195*6 A circuitry).
5	Part 4: Scope of Work & Technical Specification	Battery Energy Management System Category B / Page 37	...When the BESS is discharged completely during power outages then the power to the load shall be supplied through the DG	During site visit possible connection of BESS with existing system has been identified

			set for remaining duration.	
6	Part 4: Scope of Work & Technical Specification	Battery Energy Management System architecture Page 37	BESS should have the capability to monitor and control the operational parameters (Grid V & I, P, Q, f, battery V & I, SOC, relay/actuator command etc.). Remotely through communication interface	Yes, bidder's scope is to only monitor the grid parameters and control command will be given to equipments related to BESS operation.
7	Part 4: Scope of Work & Technical Specification	Battery Energy Management System architecture Page 37	The sampling time for recording of the parameters shall be adjustable up to 100 ms. The real time analogue data such as grid voltage & current, battery voltage & current, SoC, frequency etc. at 10-60 second interval (reconfigurable) and digital data such as alarm, events will be stored for 30 days	Sampling time of recording shall be reconfigurable between 10 to 60 second.
8	Part 4: Scope of Work & Technical Specifications	Design and Construction Requirements Page 41	BESS system will be inter-connected with grid at secondary terminal of distribution transformer i.e. three-phase four-wire, 433 Volts (L-L) at point of common coupling (PCC). The above mentioned inter-connection point is suggested for category-A & category-C application. However, probable inter-connection point of BESS for category-B will be at 3-phase output of DG set. However, it may further change slightly after the site visit to installation site.	Designing, connections and retrofitting of any of the existing configuration shall be in scope of bidder only.

9	Part 4: Scope of Work & Technical Specifications	Special tools and mandatory spares page 45	In addition, battery modules of capacity 1kWh of lithium ion (NMC/LFP/LTO or advanced lead acid) shall also be provided as spare items, which will be used for research purpose and placed in TERI's Smart Control Laboratory at TERI Gram, Gual Pahari, Gurugram, Haryana	Additional price of spare items shall be the part of bid.
10	Part 4: Scope of Work & Technical Specification	Page No. 38 / Part-IV Technical Specifications	EMS shall link all three (3) sites which are to be installed in the current tender. However, EMS shall be extendable in case additional battery storage systems get installed in future at other locations or existing battery energy storage system gets replaced with a newer technology and/or of different size.	Inter-connection between BESS of these sites is not required. However,EMS of each site shall be communicated to SCADA system separately and it shall be inter-operable through API. Confirmed
11	Part 4: Scope of Work & Technical Specification	Page No. 38 / Part-IV Technical Specifications	EMS of BESS shall be designed in such a way that it could be interfaced with existing SCADA system of the utility. The field status of key operational parameters must be communicated to a centralized control station of the distribution utility through Modbus communication and it shall have feature to control the system from centralize control station.	SCADA center and centralize control station are same.

12	Part 4: Scope of Work & Technical Specification	Page No. 38 / Part-IV Technical Specifications	The bidder shall share the open Application Program Interface (APIs) of the EMS with customizable data structure for integration of any future battery energy storage system of any make at multiple locations. EMS shall be interoperable with any other EMS or Distributed Energy Resources Management System (DERMS) having the same protocol and with SACDA through IEC 60870-5-104 protocol. It is reemphasized that the EMS so supplied should be supporting open protocols capable of integrating multiple battery energy storage systems at different locations in future as well.	Bidder shall be informed and take their consent in case future BESS to be integrated into existing system. We require API just to interface all three EMS and control it (separately) from a common dashboard.
13	Energy Meters			Existing energy meter will not be part of BESS. Bidder has to install their own meter to monitor electrical parameters
14	Table 4	Particulars of Work	Site survey, planning, design, engineering, transportation to site, insurance, supply at site, un-loading, handling, installation, integration, testing, commissioning & demonstration for acceptance of all equipment/ materials and miscellaneous items required to complete the BESS installation, at identified locations within BRPL license area in the NCT of Delhi.	As discussed during site visit, all of the available space have been shown to the bidders. They have to design their systems based on the dimensions available. TERI is not liable to provide anymore space
15	General	Scope of AMC & Onsite Warranty	Scope of AMC & Onsite Warranty	

16	General	Change in Law		Can be discussed at the time of Negotiations
17	General	Permissions & Approvals		Permissions/approvals/clearances required for work are in the scope of BRPL/TERI.
18	General	Limitations of Liability		The aggregate liability of the contractor to the employer will be the part of final agreement during purchase order.
19		Section : General Conditions of Contract Clause 23 : Termination for Convenience	'TERI', may by written notice sent to the contractor/bidder, terminate the contract, in whole or in part at any time for its convenience. The notice of termination shall specify that termination is for the purchaser's convenience in the interest of 'TERI'.	The contractor will be compensated for the work that has been completed, till the point of termination. The work will be verified jointly by TERI, BRPL & contractor.
20		Page 29 : Note	Point No. 2. The selected Contractor / Bidders are mandatorily required to open service center to carry out on-site warranty services at site before accepting any purchase order.	Anywhere in the NCT
21		Clause 1.0 V, page 15/68 of Tender document	Overall Average Annual Turnover of the Company/ Firm/ Corporation in the last three financial years(FY 2016-17, 2017-18& 2018-19) should be at least INR 10 Crore (Ten Crore). This must be the individual Company /Firm/ Corporation turnover and not that of any group of Company/ Firm/ Corporation. A summarized sheet of average turnover certified by registered	Overall average annual turnover means companies turnover and not for BESS business alone in last 3 years.

			CA should be compulsorily enclosed along with corresponding balance sheets.	
22	Scope of work & Technical Spec	Part 4	<p>For Category C TERI-School of Advanced Studies (SAS) is an institution with TOD tariff applicable for four months. In this case, BESS will be charged during off-peak hours and discharged during peak hours. This application aims to demonstrate BESS operations with difference in prices during a day at a constant rate. During remaining times of the year, BESS operations may be used for research work within technical constraints of the battery technology.</p>	Will be provided by TERI, though operating modes are subject to technical constraints listed under this tender
23	General Information	Part 1	<p>Checklist of Annexures/ documents are to be annexed and flagged by the Bidders along with the bid Valid CPRI/ ERDA/ equivalent international laboratory type test certificate of offered battery storage system and PCS. (Test certificate should have been issued on or, before 13-12-2019)</p>	The bidder shall submit the test certificates during detail engineering stage after award of contract.
24	Location			Installation is Indoor but it should be containerized solution

25	Connectivity Scope			Termination for BESS and any modifications required shall be under scope of bidder. However, BSES shall extend their support in the execution work.
26	General Information			The existing transformer rating are : Cat A: 990 kVA, Cat B: 630 kVA, Cat C: 1600 kVA
27	13	1.2.2	...the purchaser has the rights to get sample of Li-Ion/Advanced Lead Acid Battery Bank tested by any reputed independent test lab (approved by TERI/BRPL) at the cost of bidder.	All charges related to testing of the equipment supplied has to be borne by the bidder.
28	13	1.2.5	Any additional equipment/ system required for successful implementation of BESS and not covered during initial site visit before submission of proposal shall be supplied. No payment on this account shall be paid by TERI/BRPL.	Prima facie point of interconnection can be referred under corrigendum #2. Though, bidders are free to modify the same best in interest of the project on mutual consensus with TERI. Identifying appropriate connection point signifies bidders technical capability
29	16	2. Other Eligibility Conditions	A) The 'Financial bids' of only those bidders shall be opened, who qualify in 'Minimum Eligibility Conditions' as above and score at least 70% (Seventy percent) Points in 'technical evaluation'.	Correct. 70% up-to step #3
30	26	2.1	Liquidated Damages:a sum equivalent to 1.0% of the price of the unperformed services for each week of delay until actual performance up to a maximum deduction of 10% of the delayed services.	LD will be applied on value of services which remains incomplete

			Once the maximum is reached, 'TERI' may consider termination of the contract....	
31	42	EMS interfacing	...The field status of key operational parameters must be communicated to a centralized control station of the distribution utility through Modbus communication and it shall have feature to control the system from centralized control station...	The interfacing of EMS with SCADA system through appropriate communication protocol shall be in scope of bidder.
32	42	EMS API	...The bidder shall share the open Application Program Interface (APIs) of the EMS with customizable data structure for integration of any future battery energy storage system of any make at multiple locations...	Bidder shall be informed and take their consent in case future BESS to be integrated into existing system. We require API just to interface all three EMS and control it (separately) from a common dashboard.
33	Evaluation of financial bid	Page no. 12; Table:5	Financial evaluation shall be carried out on the basis of total BESS cost for supply, installation, commissioning and maintenance, per unit cycle cost (INR/ cycle) or per unit cost (INR/ kWh) etc.	As per the financial bid format
34	Price basis	Page 31; Clause 12	Bidders require quoting their prices on landed cost basis and separate price for each item. For supply to installation site, the price shall be inclusive of packing, forwarding, and freights, GST to be mentioned separately	It has to be separately mentioned as per the financial bid format. Also same has to be mentioned separately in component wise costing to be provided along financial bid

35	Work Acceptance		Contract is silent	Contractor has to give the intimation to TERI in writing for successful testing and commissioning of work completed. The Employer and the contractor together carry out an inspection and issue an acceptance note within 30 days of such intimation by the contractor. From this point of acceptance defect liability period starts.
36	Time Extension		Contract is silent	Time extension clause can be finalized during negotiation on mutual agreement
37	Transfer of Title		Contract is silent	Title of goods will be transferred on successful commission of the system at prescribed site.
38	Indemnities Liability		Contract is silent	Contractor shall be liable for indemnities up to contract value to customer
39	Factory Acceptance Test	Page no. 44	The contractor shall carry out factory acceptance test (FAT) at sub system and module level and it shall include for all component to the extent possible. The contractor shall submit FAT document to approving authority.	FAT shall be carried out at manufacturer premises before dispatch of material. TERI shall verify the FAT certificate prior to installation at respective site.
40	Lockable Storage/Store Space availability	NA	NA	Local storage, security, and other amenities has to be managed by the supplier excluding electricity
41	Office Space	NA	NA	Has to be managed by the supplier
42	Energy Management System	Page no. 38	EMS of BESS shall be designed in such a way that it could be interfaced with	Communication protocol has been mentioned. Further detail shall be

			existing SCADA system of the utility.	provided during execution
43	Energy Meters	Page no. 41	Energy meter of 0.5 class accuracy (as per IS-14697) shall be provided for recording export/import energy from/to BESS. CTs and PTs used in the energy meter will be under scope of contractor	It would be required in each category since parameter's monitoring is required to perform the control action.
44	Consent letter for financial contribution	Page no. 61	Consent letter for financial contribution	Its not mandatory, since it is a research Pilot. Any financial contribution will be appreciated
45			Category-B: Here in, the proposed application of BESS is to supply the back-up power to common/critical loads (loads such as lift, water pump and lighting load) of gated group housing society during power outages. The system will be charged from grid power and also from existing solar PV installed as and when available. Additionally, there should be a provision to charge the BESS from DG power, DG synchronization if required.	This has been clarified in the site survey
46			Category C	C-rate will not depend on load demand as BESS will discharge with constant C-rate in each ToD time slot for category C.
47			The battery storage shall discharge during pre-defined peak hours with constant C-rate as per equation expressed in annexure-III.	This is for averaging out the voltage and current waveform in each interval time (5 min.) to evaluate and communicate the set point for discharge and charge action. According to sampling theory it

				should even be lesser than 100 ms since 50 Hz signal should have sampling frequency of 100 Hz or higher.
48			The sampling time for recording of the parameters shall be adjustable up to 100 ms.	Since this is the R & D project, we need granular form of data to further extend our study. In-addition, sensors now a days are very much capable to take sample at fast rate (this is the minimum sampling rate)
49			An additional remote monitoring unit (42") displaying required features shall also be provided at TERI HQ with suitable configurations.	Contractor has to provide 42" Monitor
50			Each cell should be provided with pressure regulated valve (if required as per battery technology). The valve should be self-re-sealable and fire resistant.	It is required for specific technologies as already mentioned
51			ensure that no damage to the environment occurs during transportation	All the batteries being transported from site to the premises of recyclers or for disposal should reach there as they were expected. There should be no loss in between.
52	Part 4: Scope of Work & Technical Specifications Page 32		Category-A: BESS will be used to manage overload of a Distribution Transformer (DT) serving mainly residential consumers. BESS to be installed on the LT side of DT will be charged when the loading of DT is lower than a particular threshold level and discharged when loading exceeds the	Control algorithm is already mentioned in the Annexures which can also be modified by the bidder looping in TERI

			defined threshold level.	
53	Part 4: Scope of Work & Technical Specifications/Note Page 32		Above sites are indicative, in-case of any change BRPL/ TERI will provide other similar sites. There will be other applications of BESS in those sites, in-addition to primary applications.	All the applications that would be explored in future will follow the technical constraints of the system that will be installed by the bidder as the part of this tender. Any technical modifications will be as per the mutual agreement of TERI & contractor (If any)
54	Part 4: Scope of Work & Technical Specifications/Scope of Work/1.0 Erection & Commissioning/B./d. III Page 33		Commissioning certificate from relevant authorities for the facility.	All the permissions and associated certificates from distribution utility herein BRPL will be under bidders scope
55	Part 4: Scope of Work & Technical Specifications/Battery Technology/Table 7 Page 36		Point No. 4. Life Cycle : At-least 3,000 in case of Advanced Lead Acid and 4,000 for Li-Ion at rated DoD	Cell replacement can be considered within the specified service life period to meet cycle life requirement. But this is under bidders scope.

56	Part 4: Scope of Work & Technical Specifications/Battery Energy Management System/The Battery Energy Management System (EMS) architecture shall comply with following requirements: Page 37		Bullet Point No. 3 : EMS shall be capable of making all monitored data and events available through the Distributed Network Protocol (DNP3) communication interface and shall allow the display of current values and recent historical trend (such as past 24 hours).	Communication protocol has been mentioned. Further detail shall be provided during execution
57	Part 4: Scope of Work & Technical Specifications/Battery Energy Management System/The Battery Energy Management System (EMS) architecture shall comply with following requirements: Page 38		Bullet Point No. 10. EMS shall link all three sites which are to be installed in the current tender. EMS shall be interoperable with any other EMS or DERMS having same protocol.	All the three EMS for each site are separate. Though, a common dash board shall be generated for all three EMS through API so that respective command window of EMS can be operated from a single screen/dashboard.
58	Other Key Points		TERI reserves the right to split the order to more than one bidder if the technically qualified bidders can match the L-1 price.	If more than one bidder is awarded contract, In that case another bidder will be given another site (another category).

59	Why there is requirement of link all the three EMS of different site. Since all EMS are integrated to plant SCADA, user will have monitoring and control of all the three site BESS from SCADA. It is a very special requirement and require lots of customization.			All the three EMS for each site are separate. Though, a common dash board shall be generated for all three EMS through API so that respective command window of EMS can be operated from a single screen/dashboard.
60	Clause: 11.2.2, Page: 24 / 68		The Defect liability period shall be 12 months from the date of commissioning and warranty period of be 5 (five) years for complete system including battery from the date of commissioning and handing over of the system or number of lifecycles mentioned in the bid whichever is later.	CAMC will start after completion of DLP
61	Clause 1.2.2 at Page No.-9		The purchaser has the rights to get sample of Li- Ion/Advanced Lead Acid Battery Bank tested by any reputed independent test lab (approved by TERI/BRPL) at the cost of bidder.	It shall be tested by third party agency at their own lab

62	Clause 1 (vi) at Page No.-11		<p>“The Bidder having installed & operationalized the battery energy storage system(s) of cumulative installed capacity of 125 kW for 2 hours or higher, out of which at least one grid interactive battery energy storage system should be of 50 kW for 2 hours capacity or, higher (in India or globally). Certificate 2 Tender No TERI/MAT/2019–20/002 issued by the Employer/ Client certifying the operation without any adverse remark along-with copy of purchase order prior to the date of technical bid opening, shall be provided.”</p>	Minimum eligibility criteria considers both Li-ion and Lead Acid technology
63	Part:4, Battery Energy Management System,2.g, Page No. 38		A restricted access to monitor the operating parameters through web/ online portal as well as mobile app shall be provided to TERI and BRPL.	It should be accessible on smart-phone, a web link will also do
64	Part:4,Table No. 11 , Page No. 43	General and safety requirements: IEC 62040-1 or IEC 62477-1 or Equivalent		IEC 62109-1 &2 standard is related tp PV inverter (rejected)
		Interconnecting distributed resources with electrical power system: IEEE 1547/IEC 61850(communication standard) UL		IEC 62116 & IEC 61727 is related to utility interacted PV system (rejected)

		1741 (testing)		
		Power conditioners - Procedure for measuring efficiency: IEC 61683 or, Equivalent		Whatever certificate is provided it must follow the mentioned standard
65	Table 6, page 36/68 of Tender document	Cat-A		As of now there is no any secondary application is decided. However, it can be implemented in future within technical constraints of the system which will be installed by bidder. Any modifications will be on a mutual agreement (if any).
66	Table 6, page 36/68 of Tender document	Cat-B		New meter shall be installed
67	Part 4	Scope of work & Technical Spec	For Category C TERI-School of Advanced Studies (SAS) is an institution with TOD tariff applicable for four months. In this case, BESS will be charged during off-peak hours and discharged during peak hours. This application aims to demonstrate BESS operations with difference in prices during a day at a constant rate. During remaining	It is mentioned in control algorithm. However the same can be modified looping in TERI, considering what is best suitable to BESS. This lies in the scope of Bidder.

			times of the year, BESS operations may be used for research work within technical constraints of the battery technology.	
68	Part 1	General Information	Checklist of Annexures/ documents are to be annexed and flagged by the Bidders along with the bid Valid CPRI/ ERDA/ equivalent international laboratory type test certificate of offered battery storage system and PCS. (Test certificate should have been issued on or, before 13-12-2019)	Bidder can submit the type test during the project execution stage with Undertaking letter.
69	General Information			The existing transformer rating are: Cat A: 990 kVA, Cat B: 630 kVA, Cat C: 1600 kVA
70				No separate layout plans will be shared, already, two site visits have been arranged.
71	Disposal/ Battery Recycling Plan Page 48/68		Once a storage device has reached the end of its useful life, the bidder should have a disposal or recycle plan for both the lithium ion and advanced lead acid batteries.	Technical presentation has made it must to provide disposal plan as detailed as possible. This is a part of technical scoring
72	The Battery Energy Management System (EMS) architecture Page 41/68		The sampling time for recording of the parameters shall be adjustable up to 100 ms. The real-time analogue data such as grid voltage & current, battery voltage & current, SoC, frequency etc. at 10 second	Minimum Sampling time for monitoring is 10 msec and for recording of certain parameters it is 10 sec

			interval and digital data such as alarm, events will be stored for 30 days.	
73	Taimoor Nagar, New Friends Colony, New Delhi			Sufficient height is available which can also be used
74	Part 4: Scope of Work & Technical Specifications, Page 42 of 68		The Battery Energy Management System (EMS) architecture shall comply with following requirements: EMS shall link all three (3) sites which are to be installed in the current tender	The system shall be controlled from SCADA center.
75	DEMURRAGE			Contractor will be held responsible for such charges only when the delays are solely attributable to the Seller.
76	Part 3: General Conditions of contract 32. Material-Quality & Workmanship		In order to ensure efficient and flawless running of the system, there should be a dedicated skilled person to take care of system working at each site	This remains there, however cost of maintaining and hiring of that personnel should be separately mentioned in the financial bid
77				Site wise bidding is allowed. But preference will be given to bidder bidding in all three categories