



DISTRIBUTION GRID-SCALE BATTERY ENERGY STORAGE

**Expression of Interest for EPC, O&M, and ownership of
20MW/40MWh at 33/11 kV Grid substation in Delhi**



**Global Energy Alliance
for People and Planet**

TABLE OF CONTENTS

1.	Information	3
2.	Introduction	4
2.1	About GEAPP	4
2.2	About BRPL.....	5
2.3	Background	5
3.	INDICATIVE ROLE AND RESPONSIBILITIES OF PARTIES FOR PILOT PROJECT	6
3.1	BRPL’s Role	7
3.2	GEAPP’s Role.....	8
3.3	System integrator’s Role.....	8
3.4	Commercial investor’s Role.....	8
4.	APPLICATION FORM / ANNEXURES	9
4.1	ANNEXURE I: INFORMATION ABOUT PARTIES	9
4.2	ANNEXURE II: INFORMATION FROM SYSTEM INTEGRATORS	10
4.2.1	About the technology: Techno-Economic Details.....	10
4.2.2	About Project.....	10
4.2.3	Budgetary Cost:	11
4.2.4	Technical Datasheet.....	11
4.2.5	Details of Reference Projects if any	11
4.3	ANNEXURE III: INFORMATION FROM COMMERCIAL INVESTORS	12

1. Information

The Global Energy Alliance for People and Planet (GEAPP) is Inviting Expression of Interest from interested parties as part of a market sounding exercise for a distribution-level Grid Scale Battery Energy Storage System (BESS) pilot project. It is expected the 20MW/40MWh (2 hours) BESS will be installed at a 33/11kV Grid substation of BSES Rajdhani Power Limited (BRPL). The BESS is expected to be designed to provide 2 cycles of daily operations for a period of 12 years to tap into benefits such as energy arbitrage, peak shifting, ramping support to integrate Variable Renewable Energy (VRE) generation, ancillary services, deferral of network/line upgrades, etc. This pilot for deployment of BESS at scale could support future development of the technology and sector adoption, which will support grid stability and reliability, while enabling increased penetration of renewable energy. There is potential for reduction of carbon emissions by enabling adoption of renewable generation, and support for reliable, clean energy supply.

In this regard, GEAPP is seeking responses and submission of information from interested parties in one or both of the following areas:

1. **System Integrators (SIs)** for Engineering, Procurement, and Construction (EPC) as well as operations & maintenance (O&M) of the BESS
2. **Commercial Investors** for ownership (potentially partial) of the BESS. System Integrators may also express interest as commercial investors

Deloitte has been appointed as the Project Management Unit for the BESS project.

DOWNLOAD AND TIMELINES FOR SUBMISSION OF EOI:

- a. Last date for submission of EOI: 14.07.2023 through email specified below
- b. Response Validity: 3 months from the last date for EOI Submission

For consideration of EOI, responses, parties are required to e-mail responses with duly signed supporting documents to the e-mail mentioned below

Email to:

1. akstripathi@deloitte.com
 2. nshaju@deloitte.com
-

2. Introduction

2.1 About GEAPP

Global Energy Alliance for People and Planet (GEAPP) LLC is a limited liability company organised under the laws of the State of Delaware, USA and organised and operated exclusively for charitable and educational purposes within the meaning of Section 501(c)(3) of the Internal Revenue Code of 1986, as amended. GEAPP is committed to alleviating poverty by providing access to clean and reliable energy to people with inadequate access and to accelerating equitable energy transitions that will avert continued global warming. In furtherance of these purposes, GEAPP is focused on delivering transformational projects that will accelerate and scale an equitable energy transition across the emerging and developing world.

GEAPP is a collective action platform with a radically collaborative approach. GEAPP's work is tailored to affect a systemic intervention on all aspects of market failures that have resulted in insufficient access to modern energy for billions of people and a worsening climate crisis. The alliance is a coalition of committed anchor, investment, and upstream partners all working together towards a shared mission, in partnership with countries in Africa, Asia, Latin America and the Caribbean to:

- **Reduce Carbon:** As an alliance we are working to reduce 4 gigatons of future carbon emissions.
- **Expand Access:** Extending sustainable, reliable, productive-use energy to 1 billion underserved people.
- **Create Jobs:** Enabling 150 million new jobs that generate inclusive economic growth and sustainable livelihoods for local communities.

GEAPP works systematically and simultaneously to deploy three levers:

1. **Enabling Environments:** *Building capacity and market conditions for private sector solutions.*
2. **Innovation and Entrepreneurship:** *Catalyzing new business models to crowd in private sector solutions.*
3. **Risk Capital:** *Deploying high-risk capital to encourage private sector solutions and assist just transition solutions.*

2.2 About BRPL

BRPL is one of the electric utilities catering to consumers in the South and West of Delhi. BRPL, being a progressive and responsible utility, has been making all efforts in deploying new technologies which are environment-friendly and economical to customers. BRPL distributes power to an area spread over 691 sq. km with a customer density of ~4,327 per sq. km. Its over ~3 million customers are spread in 22 divisions across South and West areas including Alaknanda, Dwarka, Hauz Khas, Jaffarpur, Janak Puri, Khanpur, Mundka, Najafgarh, Nangloi, Nehru Place, New Friends Colony, Nizamuddin, Palam, Punjabi Bagh, R.K. Puram, Saket, Sarita Vihar, Tagore Garden, Vasant Kunj, Vikas Puri, Uttam Nagar & Mohan Garden.

BSES Rajdhani Private Limited (BRPL) is one of the highest performing DISCOMs in the country, which has successfully met peak demand of 3,389 MW with a track record of advancing critical clean energy solutions.

2.3 Background

Load profiles have become more variable in recent years, with sharper morning and evening peaks. On the supply side, the growth of Variable Renewable Energy (VREs) has enhanced the intermittency in generation. The time-varying mismatch between electricity supply and demand is a growing challenge for the electricity sector in India. This difference is expected to be further exacerbated by India's plans to continue to increase and scale up VRE penetration.

India's updated National Electricity Plan 2023, identifies Pumped Hydro Storage System (PSP) and BESS as the commercially deployable solutions for providing requisite storage capacity. The National Electricity Plan, 2023 has revealed that the requirement of BESS by the end of the year 2026-27 is **8,680 MW/34,720 MWh** and by the end of the year 2031-32 is **47,244 MW/ 236,220 MWh**. This will be in addition to 26,686 MW of PSP envisaged to be a component of the installed capacity in 2031-32. Energy Storage Systems (ESS) assets can provide the required flexibility in generation apart from ensuring the resource adequacy. Besides, ESS also have the potential to enable better utilization of the country's transmission network and reducing network infrastructure footprint.

Until recently, high costs and low round trip efficiencies prevented the mass deployment of battery energy storage systems. However, increased use of lithium-ion batteries in consumer electronics and electric vehicles has led to an expansion in global manufacturing capacity, resulting in a significant cost decrease that is expected to continue over the next decade. The low cost and high efficiency of lithium-ion batteries has been instrumental in a wave of BESS deployments in recent years for both small-scale, behind-the-meter installations and large-scale, grid-level deployments.

BRPL is considering deploying a 20 MW/ 40 MWh BESS project to provide multiple services at the Distribution end. The end goal of the pilot is to display the operational benefits of value stacking BESS's services to Discoms and establish ways to operate and integrate the asset with a view to collating and sharing lessons that could inform sectoral needs to accelerate the adoption of BESS in India's power system.

2.4 EOI Process

The response(s) received from third parties will be shared with BRPL, [Deloitte India] and others without any obligation of confidentiality. The information received shall be utilized inter alia for:

1. Identification of suitable technologies which fits the intended use cases
2. Formulation of specifications for various systems/stages required for execution of demonstration/commercial project
3. Identification of interested parties for future collaboration on the project.

2.5 Miscellaneous

1. Notwithstanding anything contained in this Eol, GEAPP/BRPL reserve the right to accept or reject any response and to suspend or terminate the EOI process and reject all responses at any time without any liability or any obligation for such acceptance, rejection, suspension or termination and without assigning any reasons therefor. In the event that GEAPP/BRPL rejects all the responses or terminates this process, they may, at their discretion, invite parties to submit fresh responses.
2. For avoidance of doubt, this Eol does not constitute a procurement process by GEAPP. A formal procurement process through an RFP is expected to be arranged separately and in the future.
3. This EOI document does not and will not create or give rise to any legally binding obligations upon GEAPP, BRPL or any other party to perform any activities or provide any funding. This EOI process document does not constitute an offer or a commitment by GEAPP, BRPL or any other party to provide financing or funds, nor does it create any rights in any third party.
4. No provision of this market sounding document and no action by GEAPP or BRPL will establish or be deemed to establish a partnership, joint venture, principal-agent relationship, or employer-employee relationship in any way or for any purpose whatsoever between GEAPP, BRPL or any other party.

3. INDICATIVE ROLE AND RESPONSIBILITIES OF PARTIES FOR PILOT PROJECT

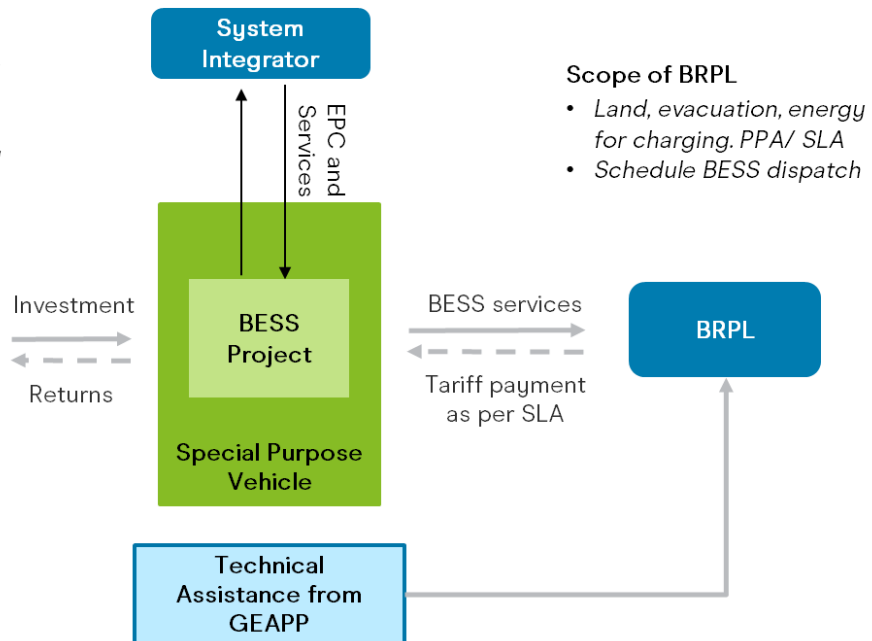
It is expected that the BESS system will be owned by a Special Purpose Vehicle (SPV), with operations and maintenance conducted by the system integrator for a period of 12 years. The SPV will be paid by BRPL through a fixed tariff (in Rs/MW terms) that is approved by the Delhi Electricity Regulatory Commission (DERC). The tariff may include provisions for annual adjustments to accurately reflect the realized benefits, which would be assessed by DERC. A summary of each stakeholder's role within the project is provided below:

Scope of SPV:

- Mobilize some capex as equity
- Build, Own, and Operate for 12 years
- Transfer assets to BRPL at end of period

Commercial investors

- Equity investment in BESS through SPV
- Receive ROE
- Arrange Concessional capital if needed



Scope of BRPL

- Land, evacuation, energy for charging, PPA/ SLA
- Schedule BESS dispatch

3.1 BRPL's Role

- Provide access to land for installation and commissioning of the system within BRPL substation premises
- BRPL shall provide power supply feeder from the nearest available switchgear in 11kV HT panel. However complete electrical system from terminal point (power supply feeder at switchgear) onward shall be in the scope of vendor.
- Guide the parties in applying for statutory clearances for the project.
- Facilitate the installation and commissioning of the system, to the extent possible.
- Support in Data collection and analyzing the performance of the system during testing and subsequent operation.
- Provide access to utility operating environment to integrate BESS operations by the system integrator through suitable APIs and data integration
- Prepare and apply suitable application to DERC for approval of the BESS pilot project and support the approval process through providing necessary data support by responding to queries from DERC
- Provide access to operating data of BESS charging, discharging and value stacking and prepare true-up application to DERC every year for suitable PPA tariff adjustments

3.2 GEAPP's Role

- In line with its charitable mission, GEAPP provides a range of support for BESS project development. The support from GEAPP may include de-risk funding, technical assistance, project development support, etc., and is based on individual projects and regional needs which are evaluated by GEAPP on a case-by-case basis.

3.3 System integrator's Role

- Design, engineering, manufacture, supply, erection, commissioning, and testing of BESS, incorporation into existing grid within BRPL substation premises, along with all associated electrical, civil/ structural, control and instrumentation and other accessories and power evacuation at 11 KV level required for completion of the project
- Advanced Energy Management System and Data storage in server hosted in India.
- Routine operations and maintenance of the systems for a period of 12 years from the date of commissioning as per SLA terms
- Data collection and analyzing the performance of the system during testing and subsequent operation
- Getting required statutory clearances for installation and operation of the system
- Sharing the stack and system level information for comprehensive understanding of the system
- System Integrators may also express interest as commercial investors

3.4 Commercial investor's Role

- Equity investment into the SPV that will own the project for 12 years
- Equity holder expected to benefit from a commercial return on equity for 12 years (to be identified). Excess returns beyond this level may be shared or redirected to agreed uses.
- Parties may submit joint responses as commercial investors and system integrators. In case of a consortium, where commercial investor has tied up with a SI to express interest, suitable consortium agreement/ letter of intent be provided along with past experience of successful projects by the lead consortium partner, as outlined below.

4. APPLICATION FORM / ANNEXURES

For consideration of EOI, PARTIEs are required to e-mail responses with duly signed supporting documents to the e-mail mentioned below

Email: To:

1. akstripathi@deloitte.com
 2. nshaju@deloitte.com
-

4.1 ANNEXURE I: INFORMATION ABOUT PARTIES

1. Name of the Company
2. Legal status of the Company
3. Brief description of the Company including details of its business groups/subsidiaries/ affiliates:
4. Existing Manufacturing facilities – Locations, Capacity
5. Date of Incorporation
6. Date of Commencement of Business
7. Full address including Telephone nos. / Fax nos.:
 - a. Registered Office:
 - b. Head Office:
 - c. Address for communication:
 - d. Contact Details:
 - e. Office Address in India, if any:
8. Collaborations/tie-ups with technology providers/ developer (if applicable),
9. Details of Indian parties, if any, for installation, supply, services, and collaboration
10. Financial Data of Organization (Attach Relevant document in proof of same)

	Financial year 2021-22	Financial year 2020-21	Financial year 2019-20
Turnover			
Net worth			
Profit			

The proposer should demonstrate having sound financial situation and capacity by submitting financial audit reports with annual turnover of at least the minimum

amount indicated in the table in any of the last 3 years. Further, the proposer should have been in business for at least last (5) years.

4.2 ANNEXURE II: INFORMATION FROM SYSTEM INTEGRATORS

System Integrators are expected to furnish a technical write up containing at least following information-

4.2.1 About the technology: Techno-Economic Details

- Basic working principle and Process diagram
- Battery Chemistry
- Characteristics parameters as per technical data sheet
- Scalability and modularity aspect
- Charge and Discharge Rate Control mechanism
- Performance parameters, guarantees and factors affecting performance parameters
- Details of Mechanical, Electrical, Civil and Control and Instrumentation system
- Details of accessories required for running the system
- Details of Energy Management system
- Codes and standard details
- O&M & Safety Aspects
- Details of Effluent generation if any
- Hazardous material, if any, after end of life. Disposal method after end of life
- Details of Capex, Opex and Project Schedule
- Expected future cost reduction and justification of the same
- Cost Components of BESS, factors affecting cost and scope of cost optimization
- Share of Imported and local content on total project cost
- Best use case/ merits/ demerits/ limitations
- Details of investors, if any, for the technology and certificates
- Auxiliary consumption
- Any other relevant details as applicable
- Cooling system (HVAC), cycle calculation method, EMS algorithms and flexibility

4.2.2 About Project

- Parameters of the proposed BESS (Primary Subsystem – Battery and Power Conversion, Auxiliary plus Control Systems)
- Components details and technical specification of components
- Guarantee Parameters, Warranty and Conditions
- Capacity augmentation details
- Facilities required at site and Terminal points
- Execution Period from award of job till Commissioning and Guarantee Test Run
- Environmental clearance required if any
- Partnerships with commercial investors, if any

4.2.3 Budgetary Cost:

1. Estimated total capital cost of proposed capacity of pilot project (with cost break up) of all cost component as listed below along with scope of supply and services, inclusions, exclusions-
 - Energy storage system and associated equipment
 - Civil/ Structure
 - Control system
 - Package BOP (As required for completion of pilot project)
 - Installation and Commissioning
 - Miscellaneous Items
 - Safety and protection system
 - Capacity augmentation

2. Estimated Annual Operation & Maintenance cost for all 12 years

Note: Parties shall separately mention taxes, duties, freight, insurance applicable for above items/project.

4.2.4 Technical Datasheet(Proposed)

Characteristics	Details	Remark
Round Trip Efficiency (AC-AC) %		
Auxiliary Consumption (%)		
Space Required (m ² /MWh)		
Response Time (ms-hr)		
Cycle Life (Nos. of charge/ discharge cycle)		
Daily Self Discharge (%)		
Yearly Degradation (%)		
Development & Construction period (Years)		
Annual availability (%)		
Annual Down time (%)		
Codes & Standards Compliance (UL/IEC/BIS) – Cell, Module, BMS, Inverters (power conditioning units), system		
Fire Safety Codes & Standards compliance		
EMS communication protocols compliance		

4.2.5 Details of Reference Projects if any

Details of Reference Plant	Description	Remark
Whether Commercial/ Demonstration/ Pilot?		
Status (Under Construction/ Commissioned)		

If commissioned, date of commissioning? OR if under construction, expected date of commissioning?		
Capacity		
Client Details (Name of client, address, and its contact details)		
Client Certificate, if any (Attach)		

4.3 ANNEXURE III: INFORMATION FROM COMMERCIAL INVESTORS

- Proposed size of investment, or share in SPV
- Expected rate of return for the senior equity tranche