CENTRAL EXECUTING UNIT
MINISTRY OF FINANCE
Project: *Belize Reliant and Resilient Energy Systems (BRRES) Project*
Contract title: *Design, Supply, Installation, Testing, Commissioning and 3-Year Operations & Maintenance of Four (4) Grid-Scale Battery Energy Storage Systems*

Pre-bid Clarification #3
RFB No: *BZ-MFEDI -CEU-539302-CW-RFB*
October 20, 2026

No.	Clarification Requested	Response
1.	The procurement activity covers design, supply, installation and three years of O&M. The battery-package selection would ordinally sit with the firms submitting turnkeys bids, rather than being a separate CEU purchase. Could you confirm whether battery manufacturers and sourcing advisers should engage directly with the prospective turnkey bidders, and whether there is a public supplier or subcontractor participation route under this procurement? If procurement sits with the bidders, the approach would be to directly contact the responsible contractors rather than propose a separate battery sourcing service to CEU.	Yes. Battery manufacturers and sourcing advisers should engage directly with the prospective turnkey Bidders. The procurement is for a single turnkey contract on a single-responsibility basis (BDS ITB 17.1); the Employer will not procure batteries or battery-sourcing services separately, and there is no separate supplier or subcontractor participation route under this RFB. Manufacturers may participate as Subcontractors or suppliers to a Bidder. Any manufacturer proposed must meet the minimum criteria for Specialized Subcontractors / manufacturers in Section III, be eligible under ITB 4 and ITB 5, and provide a Manufacturer's Authorization using the form in Section IV. The Employer does not publish the list of firms that obtained the bidding document.
2.	ITB - Section VII 1.2 Scope of Works -Full Turnkey Responsibility (page 163） *States: "The Digital Twin shall include a 3D site model, real-time data integration (SOC, temperatures, power flows, alarms), physics-based simulation models, predictive analytics for degradation and maintenance, and what-if scenario capability".* Per the description of the Digital Twin, "real-time data integration (SOC, temperature, power flow, alarms)", its functions overlap with those of the EMS. Please confirm whether the Contractor shall deliver the digital twin model independently, or deliver both the digital twin model and the EMS.	The Contractor shall deliver both the EMS and the Digital Twin. The Digital Twin shall be provided as an independent deliverable, separate from the EMS. The EMS is the real-time control system of each BESS. The Digital Twin is an analytical and visualisation layer that reads data from the EMS / BMS / historian on a read-only basis and shall not perform control functions or write set-points to the plant. Minimum Digital Twin deliverables per site: 3D site model; live data feed (SOC, temperatures, power flows, alarms) with display refresh of not more than 1 minute and access to the 1-second historian data; physics-based battery and thermal models calibrated with FAT / SAT data; predictive analytics for degradation and maintenance; what-if scenario tool; user manual and training. Acceptance at Substantial Completion shall demonstrate correct live data and agreement of modelled energy, temperature and SOC

	If both are to be delivered, the Employer is kindly requested to define the functional boundary, data sources and interaction relationship between the digital twin and EMS, and provide the delivery list, acceptance criteria and data update frequency of the digital twin model, so as to define the scope of development work.	with measured test data within ±5 % over at least one full charge / discharge cycle. IEC 62443 SL-3 applies to all interfaces.
3.	ITB - Section VII 1.2 Scope of Works – Full Turnkey Responsibility (page 163） *States: "11. Ten year battery capacity warranty. 12.Design of all equipment, systems, materials, and components for a minimum useful life of fifteen years under the specified operating conditions and duty cycle, supported by the planned battery augmentation program".* Whilst the complete equipment is designed for a 15 year service life supported by the planned battery augmentation program, the battery capacity warranty is limited to 10 years. Please specify which party shall bear risks and costs associated with battery capacity degradation over Year 10 to Year 15, as well as the trigger criteria for battery augmentation or replacement activities.	During the ten (10) year battery capacity warranty, the Contractor bears the risk of capacity degradation below the warranted values (ER 8.2). The Employer shall bear the risks and costs associated with battery capacity degradation from Year 11 to Year 15. The Contractor's obligations in that period are limited to the fifteen (15) year design-life requirement (ER 1.2) and the compatibility of the original design with future augmentation (ER 8.3). Any augmentation or replacement is at the Employer's discretion, informed by the Bidder's Augmentation Plan and the measured capacity of each site.
4.	ITB - Section VII 3.1 Geotechnical Investigation and Foundation Design （page 174） *States "Number & Depth of Borings：Minimum 6 borings per site advanced to refusal".* For the term "refusal", please provide its definition and clear judging criteria.	The term "refusal" refers to the condition where further advancement of the borehole is no longer practicable using the specified drilling method and equipment under normal operating conditions.
5.	ITB - Section VII 4.3 Battery System – Minimum Requirements（page 181） *States: "Degradation: Calendar degradation ≤ 2%/year after Year 1"* Please specify the permitted calendar degradation value for Year 1	Calendar degradation in Year 1 shall not exceed 2.0 %. Accordingly, the calendar degradation limit of ≤ 2.0 % per year (at an average cell temperature of 77 °F ± 2 °F) applies from Year 1 throughout the ten (10) year warranty period. ER 4.3 and ER 8.2 will be amended accordingly by Addendum No. 1. Bidders shall provide a degradation curve (BDS ITB 11.2 / ER 8.3) demonstrating compliance, together with the guarantees of 100 % usable energy at

		Beginning of Life and ≥ 80 % of rated energy at the end of the warranty period.
6.	ITB - Section VII 4.3 Battery System – Minimum Requirements (page 181） *States: "Fire & Explosion Mitigation : UL 9540A certified (no fire propagation). Integrated clean-agent suppression (Novec 1230 or equivalent), multi-gas detection(CO, enting (NFPA 68), and 2-hour firerated separation. Full compliance with NFPA 855 (2023 edition)"* I. Only multi-gas detection is specified in the document, with no requirements given for dedicated temperature sensors . Could the Employer please clarify if temperature sensors need to be installed in the battery system？if so, relevant technical parameters shall be provided. II. Please clarify whether the 2-hour firerated separation can be achieved solely by battery containers or if additional physical firewalls need to be added on site.	I. Yes. Temperature sensing is required as an integral function of the BMS at cell / module level, with additional ambient and coolant temperature monitoring in each enclosure. The Contractor shall propose the technical parameters (sensor type, density, accuracy, response time, alarm and trip thresholds) in its Bid. Temperature-sensing controls shall comply with IEC 60730-2-9, in addition to the battery safety standards UL 1973 / IEC 62619 and NFPA 855. All temperature data shall be available to the EMS, historian and fire-safety logic. II. The 2-hour fire-rated separation may be achieved by enclosures certified for the required fire-resistance rating, by separation distances, by fire barriers / firewalls, or by a combination thereof, provided compliance with NFPA 855 (2023), supported by UL 9540A large-scale fire test results, is demonstrated and approved by the National Fire Service.
7.	ITB - Section VII 4.4 Power Conversion System (PCS) – Minimum Requirements （page 182） *States: "Efficiency : Peak ≥ 97.8%; at 50% load ≥ 97.0%. Efficiency curves required at 25/50/75/100% load and 0.9/1.0/1.1 pu voltage"* I. Please define the measurement boundary points for PCS efficiency. II. Advise whether power consumption from PCS internal auxiliary equipment shall be included within this efficiency test.	I. For the PCS efficiency requirement in ER 4.4 (peak ≥ 97.8 %; ≥ 97.0 % at 50 % load), efficiency shall be measured between the DC input terminals and the AC output terminals of the PCS, in accordance with IEC 61683 / IEC 62909. Losses between the PCS AC terminals and the POI (MV transformer, cables, switchgear) are covered by the separate transformer efficiency requirement (ER 4.4) and by the Round-Trip Efficiency guarantee measured at the POI (ER 5.2). II. Power consumption from PCS internal auxiliary equipment shall be included in the efficiency determination.
8.	ITB - Section VII 5.2 Round-Trip Efficiency (RTE) Guarantee (page 185） *States: "Guaranteed RTE : ≥88.0% at rated power when average cell temperature is maintained at ≤ 86°F (30°C) under 95°F (35°C) ambient conditions"* Regarding the Guaranteed RTE test, please confirm whether station auxiliary loads like UPS, fire-protection systems, and site lighting should be considered part of the system losses.	Yes. The Round-Trip Efficiency is measured at the Point of Interconnection (ER 5.2). All station auxiliary loads – including HVAC / thermal management, BMS, EMS, PCS auxiliaries, UPS, fire detection and protection systems, and site lighting – shall be considered part of the system losses. Where any auxiliary load is supplied from a separate auxiliary supply, its energy shall be metered and added to the charging energy for the RTE calculation.

9.	ITB - Section VII 5.3 Usable Energy Capacity Guarantee （page 186） *States: "Rated capacity means usable capacity, not cell or container nameplate. Nameplate energy shall be sized by the Contractor as required to deliver the specified usable MWh at BOL after all losses".* I. What specific loss items are encompassed under the phrase "after all losses", for example station auxiliary power consumption, self discharge, and charge discharge efficiency losses; II. The discharge power and temperature conditions for the BOL capacity test.	I. All losses shall be included. The specified usable energy (MWh) shall be delivered as net energy measured at the POI during a full discharge, after PCS, transformer and cable losses, all station auxiliary consumption (as defined in the response to Item 8), self-discharge and charge / discharge efficiency losses. II. The Beginning-of-Life capacity test shall be a full discharge at the specified rated AC power at the POI from 100 % SOC to the minimum allowable SOC, in accordance with ER 5.3 and IEC 62933-2-1. The design ambient temperature for sizing is 95 °F (35 °C) (ER 2.2). The test shall be carried out under the prevailing site ambient conditions with the thermal management system in normal operation; no correction of results in the Contractor's favour will be applied for ambient temperatures below 95 °F.
10.	ITB - Section VII 2.2 Climatic and Environmental Design Parameters （page 170） *States: " 2.2 Ambient Temperature : Continuous operation: 64°F – 100°F (design 95°F). No derating permitted below 113°F.* 4.2 Grid-Forming and Grid-Following Capability (Mandatory at All Sites) (page 180） *States: " 4.2 Temperature Derating : No reduction below 90% of specified rated AC power at 45°C (113°F)"* An apparent inconsistency exists between Clause 4.2 and Clause 2.2. Clause 4.2 mandates no reduction below 90 % of specified rated AC power at 45°C (113 °F), while Clause 2.2 states no derating permitted below 113°F.Could the Employer resolve and clarify this conflicting technical requirement？	ER 2.2 prevails: no derating is permitted below 113 °F (45 °C). The BESS shall deliver 100 % of the specified rated AC power at the POI at all ambient temperatures up to 113 °F (45 °C). The "Temperature Derating" requirement in ER 4.2 ("no reduction below 90 % of specified rated AC power at 45 °C") will be amended by Addendum No. 1 to align with ER 2.2.
11.	ITB - Section VII 5.6 Grid-Forming and Black-Start Specific Guarantees (All Sites) (page188） *States: "Black-Start : ≤ 5 minutes from command to stable islanded operation at rated voltage (±2%) and frequency (±0.2 Hz) while supplying up to rated Load".* The phrase "supplying up to rated load" is ambiguous. Please advise whether full rated load	It shall be 100% load step requirement as per ER 5.6 and 7.2

	must be connected instantaneously upon completion of black start. Also define the scope of initial loads: whether only station auxiliary and critical loads are required, or loads shall be ramped incrementally to full rated level.	
12.	ITB - Section VII 8.2 Component Warranties (page 199) *States: "Power Conversion Systems (PCS) / Inverters -5 years* *Thermal Management Systems - 5 years* *Fire Protection and Explosion Mitigation Systems - 5 years* *MV Switchgear, Transformers, Protection Relays, and associated electrical equipment - 3 years* *SCADA, EMS, Control Systems, and Digital Twin -3 years".* Warranty periods of 3 - 5 years for individual components are shorter than the 15 year design life of the facility. Please allocate responsibilities and cost bearing parties for repair and replacement of each component for the post warranty period up to Year 15 (for example, PCS from Year 6 15, MV Switchgear and associated equipment from Year 4 15).	After expiry of the component warranty periods stated in ER 8.2, repair and replacement of components up to Year 15 are the responsibility of, and at the cost of, the Employer (through Belize Electricity Ltd. and its operation and maintenance arrangements), except for defects resulting from gross negligence, fraud, or criminal or wilful action of the Contractor (GCC 27.9). All equipment shall nevertheless be designed for the minimum fifteen (15) year useful life (ER 1.2). Bidders shall state expected component lifetimes and any planned replacements within the 15-year period; these are reflected in the life-cycle cost evaluation (Section III).
13.	ITB - Section VII 8.3 Battery Augmentation Plan (page 200) *States:* ▪ *Submission of the Augmentation Plan and priced proposal does not create any obligation on the Employer to proceed with augmentation.* ▪ *If the Employer decides to implement augmentation in the future, the works shall be procured and priced at the prevailing market rates at that time".* The tender document states the recommended window for battery augmentation is between Year 6 and Year 7 from Substantial Completion. It requires the Contractor to ensure the original system design remains compatible with future	Only the Augmentation Plan (with a priced proposal for evaluation) is required with the Bid (BDS ITB 11.3(d), ER 8.3). Augmentation works are not part of the Contract scope or Contract Price. If the Employer decides to implement augmentation, it will procure the works separately and bear their cost, at the prevailing market rates at that time. The Contractor's obligation is limited to ensuring that the original design (space, foundations, DC and AC architecture, BMS / PCS / EMS integration) allows future augmentation.

	augmentation using identical or better LFP technology. However, the originally supplied battery cells/modules will likely be discontinued or upgraded after 6 to 7 years, and full consistency between augmented cells and original cells cannot be guaranteed. Battery augmentation falls within the contract scope but is not covered under the lump sum price; it shall be priced at the prevailing market rates at that time. Please clarify the procuring party and cost bearing party for the augmentation works.	
14.	ITB - Section VII 2.2 Climatic and Environmental Design Parameters (page 170） *States: "Finished grade and all equipment platforms set to the greater of (a) 100-year flood elevation + 2.0 ft freeboard or (b) Category 5 storm surge elevation +1.5 ft freeboard, based on Contractor's site-specific modelling. Elevated platforms or flood barriers required at Westlake, Dangriga, and San Pedro".* Please clarify the specific work activities included under "Contractor's site specific modelling". In addition, please provide baseline data of 100 year flood elevation and storm surge elevation for all four sites.	The Employer does not hold verified site-specific 100-year flood elevations or Category 5 storm surge elevations for the four sites; their determination is part of the Contractor's scope. The Contractor's site-specific modelling shall, as a minimum, comprise: (i) collection of available data from national and regional sources and site observations; (ii) topographic survey tied to the national datum (ER 3.2); (iii) hydrological / hydraulic assessment of the 100-year flood level, including drainage paths and local ponding; (iv) storm-surge assessment for a Category 5 hurricane, including wave set-up and run-up at coastal sites, with full modelling for San Pedro (ER 3.3); and (v) a report stating design levels, assumptions and resulting platform elevations, for Project Manager approval before foundation design.
15.	ITB - Section VII 1.2 Scope of Works – Full Turnkey Responsibility （page 162） *States: "At the San Pedro site: horizontal directional drilling (HDD) for all 34.5 kV power cables and control/communication cables under the adjacent town street. Minimum cover 5 ft below finished grade. HDPE ducts of 6-inch minimum diameter with a minimum of two (2) spare ducts".* Please specify the following items for the HDD works at the San Pedro site: I.extent of crossing zone and working corridor; II.existing underground utilities and obstructions; III. subsurface geological conditions; IV. required permits (such as municipal excavation permit, traffic permit, utility crossing permit),	I. The HDD crossing is under the town street separating the BESS plot from the San Pedro substation (approximately 150 ft). Entry / exit points and the working corridor shall be determined by the Contractor's survey and design, within the BESS plot and substation property, subject to BEL approval. II. The Employer does not hold a verified survey of existing underground utilities. The Contractor shall carry out utility locates and a ground-penetrating radar (or equivalent) survey and coordinate with all utility owners and the San Pedro Town Council. III. No subsurface data is available for the crossing. The geotechnical investigation (ER 3.1) shall include at least one boring along the HDD alignment. IV. Permits are the Contractor's responsibility (ER 1.4), including San Pedro Town Council approvals for street works and traffic management, utility crossing consents and any environmental clearance from the Department of the Environment. Bidders shall allow for approval lead times in their programme; the Employer will support permit applications (GCC 21.3.4).

	corresponding approval lead time and any special local regulatory requirements.	In essence, the Contractor shall be responsible for site investigations, verification of existing underground utilities, determination of subsurface conditions, and identification and obtaining of all permits and approvals required for the HDD works. The crossing alignment, working corridor, installation requirements, and applicable local regulatory requirements shall be coordinated with the relevant authorities and utility owners and submitted to the Engineer for approval prior to commencement of the works.
16.	ITB - Section VII 4.2 Grid-Forming and Grid-Following Capability (Mandatory at All Sites) （page 178） *States: "Grid-forming mode shall be the primary operating mode at all sites".* Please specify the overload multiple for the PCS.	The minimum short-term overload capability of the PCS is specified in ER 4.2: 110 % of the specified rated AC power for 10 minutes and 150 % for 10 seconds (at 50 % SOC and 77 °F). This requirement applies in both grid-forming and grid-following modes. Bidders shall also state the PCS fault-current contribution (magnitude and duration) in grid-forming mode.
17.	Please advise whether vegetation clearing is required for the four sites. If applicable, please define the clearing scope and provide compensation rates for vegetation removal.	Yes. The Contractor is responsible for vegetation clearing and grubbing within the BESS site areas and along the cable routes as necessary, in accordance with ER 3.0 (removal of vegetation, trees, stumps and roots to a minimum depth of 12 inches below existing grade, with disposal under the approved Construction Phase Environmental Management Plan). Appendix B identifies vegetation removal at Dangriga and Buena Vista; Bidders shall verify the extent at all sites. Any statutory permits and fees (e.g. Forestry Department tree-felling permit, ER 1.4) shall be obtained and paid by the Contractor and included in the Bid price. The sites are land made available by the Employer / BEL, and no third-party compensation for vegetation removal is foreseen.
18.	Site Name: Westlake, Belize District Substation Area allocated for BESS measures: 0.29 acres. Please provide the information below to facilitate energy storage layout design: I. Site legal boundary drawing in CAD format, or length and width dimensions of the area allocated for BESS;	I. The site boundary drawing and coordinates for the BESS, and drawings for all four sites will also be issued with Addendum No. 1. II. Setback distances shall comply with the Belize Building Code (Central Building Authority requirements), together with NFPA 855 (2023) separation requirements and National Fire Service approval. III. The distance from the substation to the boundary of the area allocated for the BESS is approximately 150 ft. Please note that, by Addendum No. 1, the BEL substation connection works (new incoming

	II. Mandatory site set back distances (minimum separation required between energy storage equipment and legal land boundaries); III. Distance from the substation POI to the boundary of the area allocated for the BESS adjacent to the substation.	bay / switchgear) will form part of the Contractor's scope.