



COBB ELECTRIC MEMBERSHIP CORPORATION

REQUEST FOR PROPOSALS SEEKING

**1.5 MW Solar Photovoltaic (PV) Facilities and
1.0 MW/4 MWh Battery Energy Storage Systems (BESS)
2.5 MW Combined Peak Shaving Capacity
On Cobb EMC Campus**

Release Date: Monday, November 26, 2018

Due Date: 12:00 noon EST, Monday, January 14, 2019

Cobb EMC: 1000 EMC Parkway, Marietta GA 30060

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[Email questions/comments to](mailto:Cobb.der@cobbemc.com)

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List of Abbreviations and Acronyms

AC	alternate current
A/E	architects/engineers
ANSI	American National Standards Institute
ASCE	American Society of Civil Engineers
ASME	American Society of Mechanical Engineers
BESS	Battery Energy Storage Systems
CDs	compact disks
CM	construction management
CSI	Construction Specifications Institute
DC	direct current
DoD	Depth of Discharge
EPA	Environmental Protection Agency
ETL	ETL Testing Laboratories
FM	Factory Manual
HE	Hourly Energy
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers
kWh	kilowatt-hour
kW	kilowatt
kV	Kilovolts
LED	light emitting diode
MDP	main distribution panel
MPPT	maximum power point tracking
MW	Megawatt
MWh	Megawatt-hour
NEC	National Electrical Code
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
NRCA	National Roofing Contractors Association
POA	plane of array
POI	point of interconnection
PV	photovoltaic
QCP	Quality Control Plan
RECs	renewable energy certificates
SB1	California Senate Bill 1
SOC	state of charge
STC	standard test conditions
TRECs	tradable renewable energy certificates
UL	Underwriters Laboratories
WREGIS	Western Renewable Energy Generation Information System
V	volts

Request for Proposal

Cobb Electric Membership Corporation (Cobb EMC) is soliciting proposals from a qualified proposer(s) to design, fabricate, deliver, install, and maintain a rooftop, and/or ground mounted, and/or carport mounted utility-interactive solar (PV) and BESS system to be installed on Cobb EMC campus. The proposal seeks solar PV generation with an aggregate capacity of 1.5 MW (AC) and battery energy storage with an aggregate capacity of 1.0 MW/4MWh (AC) which will be interconnected to the distribution system on the low voltage side. The proposed combined system shall be capable of producing 2.5 MW (AC) power lasting up to four hours during appropriate weather conditions.

Statement of Work

1. Project Identification

1.1. Project:

1.5MW Roof Mounted, Ground Mounted and Carport Mounted Solar PV System
1MW/4MWh Battery Energy Storage System (BESS)

1.2. Location: Cobb EMC Campus at 1000 EMC Parkway, Marietta GA 30060.

1.3. Process: The process for this RFP consists of the following steps:

1. Request for Proposal issued by Cobb EMC.
2. Proposers provide a completed Notice of Intent to Bid (NOI) Form and partially executed Non-Disclosure Agreement (NDA).
3. Cobb EMC provides fully executed NDA to proposers.
4. Proposers submit proposals per information requested in this RFP. All proposals are due by 12:00 noon EST, January 14, 2019.
5. Proposers can request and perform site visits at Cobb EMC campus before submitting proposals.
6. Proposers can submit questions related to RFP through email no later than December 17, 2018. Cobb EMC will respond to the questions within ten (10) business days.
7. Cobb EMC may ask the proposers any questions/clarifications about the proposals. The proposers shall respond to Cobb EMC within five (5) business days.
8. Cobb EMC evaluates the proposals and develops a short list for further discussions and negotiations.
9. Notification provided to all non-shortlisted proposers will take place after sufficient shortlist discussion and negotiation progress is made.
10. Contract negotiations begin.
11. A project will be awarded.

1.4. Schedule:

Milestones	Timeline
RFP Released Date	November 26, 2018
Questions/Clarification from Proposers	December 17, 2018
RFP Due Date	12 noon EST, January 31, 2019
Project Awarded	March 1, 2019
Agreements Executed	April 15, 2019
Desired Solar PV/BESS Project Completion	December 31, 2019

2. BACKGROUND

2.1. Objective. Proposer shall provide a total “turnkey” project including all necessary equipment, materials, design, manufacturing and installation services for the installation of a roof/ground/carport mounted utility-interactive photovoltaic system that shall produce a minimum aggregated of 1.5MW AC at the point of interconnections. Cobb EMC also seeks up to 1MW/4MWh BESS configured for PV/grid charging, co-located and integrated with the solar PV facilities. The proposer should prepare system summary detailing each building location, applicable equipment/size, predicted system energy production (kWh). This project shall meet all requirements of this Statement of Work and other required specifications.

If the proposer provides both the solar PV generation as well as the BESS resources, then the proposer will provide one integrated agreement. Solar PV providers that are not BESS providers are encouraged to submit stand-alone proposals for the solar PV generation. Likewise, BESS providers that are not solar PV providers are encouraged to submit stand-alone proposals for the BESS. In the event that Cobb EMC selects two different proposers that provide the solar PV generation resource and the BESS, then it may be necessary to develop additional agreements that provide for the integrated operation of the facilities.

Scope. The proposer shall perform all professional services as necessary to provide Cobb EMC with a complete design package including the requirements outlined in this Statement of Work. The proposer shall install the project such that it is operational and compliant with all applicable standards, building codes, UTILITY interconnection IEEE 1547 requirements, and STATE requirements. The proposer shall include specifications, calculations and drawings in the design package, and turn it over to Cobb EMC. After approval by Cobb EMC of the final design package, the proposer shall provide all necessary construction to successfully complete the PV and BESS system installation.

2.2. Design Guidelines for Battery Energy Storage System

Cobb EMC has identified three different locations on the campus map at buildings 1000, 3000, and 5000 each with a capacity up to 500 kW, 250 kW and 250 kW respectively. BESS will be configured for charging by the grid when the load level is at low as well as charging by the solar PV system. The configuration should maximize the peak shaving capabilities of Cobb EMC during peaking hours. Also, in the event of an extended grid outage e.g. during storms or other events, the BESS shall be used to power the buildings on campus.

Proposer will be required to guarantee rated capacity (kW) of the BESS for 10 years, provide O&M services for 10 years on the complete BESS (all major components like storage medium, inverters, communication and control management software, containment, HVAC systems), and procure and install all facilities necessary to interconnect the BESS to the solar PV system and the Cobb EMC’s distribution system. BESS pricing should be expressed in terms of \$/kW (AC) power rating.

2.2.1. Structural / Foundation Pads / Conduit

The proposer shall furnish the design for the structural components of the BESS, concrete pads/foundations as required, and conduit required for the complete BESS. All

BESS foundations and structures, if required, shall be designed by a qualified registered professional engineer licensed in the state of Georgia. All final (Issued for Construction) drawings, specifications and calculations shall be wet-stamped by a Registered Civil/Structural Engineer licensed in the state of Georgia. The proposer is responsible for Geotechnical surveying if required.

2.2.2. Mounting System

BESS proposer shall install BESS components per manufacturer requirements: a. All components shall be secured to floor or walls. b. Include structural load design calculations signed and sealed by a qualified professional engineer licensed in the state of Georgia. c. All structural components shall be installed in a manner commensurate with attaining a minimum 25-year design life.

2.2.3. Spill Containment

The BESS design shall mitigate against electrolyte spills that are credible for the types of cells used. The design shall include features that contain electrolyte spills (to be emptied by contracted chemical disposal company in the event of a spill) and prevent discharge to surrounding site soils.

2.2.4. Spare Parts and Equipment

The proposer shall evaluate its design with regard to failure rates, effects and BESS reliability. The proposer shall provide a recommended spare parts list, including prices and availability, as part of his proposal.

2.2.5. Battery Management System (BMS)

The proposer shall install BMS capable of protecting and monitoring individual battery modules and provide documentation and description/operating manuals of the BMS system as well as the communication and control system.

2.2.6. Factory Testing – Battery

The proposer shall test and submit test data for the cells designated for use on this project. The proposer shall capacity test 100% of the production cells to ensure compliance with design requirements. The proposer may propose optional alternate testing programs that result in a benefit to Cobb EMC. However, the base proposal shall include capacity testing of 100% of the cells. All proposals for alternate testing shall include details of the proposed plan and the cost benefit to Cobb EMC.

2.2.7. Grounding

A suitable equipment grounding system shall be designed and installed for the BESS system. This system shall be tied to the grounding system. The grounding system shall provide personnel protection for step and touch potential in accordance with IEEE 80. The system also shall be adequate for the detection and clearing of ground faults within the BESS. The vendor shall determine, design and install the required interconnections between the BESS and grounding systems.

2.2.8. SCADA Integration

The proposal will include options to integrate BESS with Cobb EMC's SCADA system. The engineering tasks shall include, but not be limited to, the following:

- Communication between BESS and SCADA will be DNP3.
- DNP3 map of all I/O points and controls on local BESS control system. HMI interface must be available and inclusive to SCADA system for monitoring and control.
- SCADA points list shall be prepared by the contactor and submitted to Cobb EMC for review and approval.
- BESS control system interface will have the ability to accept control setpoint signals from SCADA master station.
- Vendor shall facilitate and ensure all BESS sensor calibrations and system testing to Cobb EMC SCADA.
- Provide monitoring access and control access to all proposed BESS modes of operation, state of charge, available duration at various output levels, KW/KVAR setpoints, KW/KVAR flow, local/remote control, and BESS alarms/status.
- Work items shall include all labor, materials, test equipment, & engineering required to complete SCADA communication integration.
- The proposer shall prepare plan and section drawings for the SCADA/data concentrator integration showing the location of all equipment.
- The proposer shall provide complete testing procedures for the BESS equipment and control system and provide commissioning of the data concentrator/SCADA integration. The prepared testing procedures shall be submitted to Cobb EMC for review and approval before any testing work is done. A final report detailing the work completed, all test forms, and any marked-up drawings shall be submitted to Cobb EMC.

2.2.9. Warranty

Proposer warrants that the equipment and materials furnished hereunder, and the completed BESS project are fit for producing and storing electricity in accordance with the requirements and are free from defects in workmanship and materials. Proposer makes all such warranties for a period of ten (10) years with no more than 20% of degradation of the rated capacity after the date of acceptance of the project by Cobb EMC. In addition, proposer shall clearly indicate life expectancy given discharge profiles provided in this RFP.

2.2.10. Interconnection

The Cobb EMC distribution system is a 12.47 kV grounded wye system. The proposal shall include the cost of all transformation and protection required to interconnect at 120/240V single phase, and 120/208V, 277/480V three phase.

Metering, Monitoring and Control

The proposer will provide SCADA connections to monitor the status of battery and the inverters. The generation system shall also provide other information via a DNP3.0 protocol link. The generation system shall provide a hardwired status of the interconnection breaker and alarm status for the interconnection protection system. The

DER system shall be capable of having the voltage and other key operating parameters set remotely via the Cobb EMC SCADA/Monitoring system.

Visible Disconnect

A disconnecting device shall be installed to electrically isolate the Cobb EMC distribution system from the solar PV and BESS. The visible disconnect shall provide a visible air gap between the generation system and Cobb EMC's distribution system.

Protection

The DER system will provide proper protection in compliance with IEEE/ANSI and NEC standards that meet local electrical codes.

2.2.11. Siting

Cobb EMC is providing the campus layout diagram. Cobb EMC has identified potential areas for DER installation on the rooftops, ground mounted and carport mounted. Proposer should analyze the suggested areas and recommend any alternative options (sizing, interconnection point, location, etc.) to meet the capacity needs of this project.

Proposer is responsible for obtaining and satisfying the requirements of all federal, state and local permits, licenses, approvals and variances that are required now and in the future for the construction and operation of the project and the delivery of energy from it. Proposer is also responsible for providing all information required by Cobb EMC for any approvals Cobb EMC must obtain.

2.2.12. Technology

Cobb EMC may consider technology diversity in evaluation of proposals. Technology diversity may include applications and attributes of solar PV or BESS technology types.

Solar PV facility proposals that offer options such as enhanced energy production (tracking), increased capacity value (tracking or adjusted orientation) and day-ahead solar production forecasting are encouraged. Inverter technology capable of benefitting the distribution system through real and reactive power support will be considered.

2.2.13. Safety and Cybersecurity

A Proposer's safety history will be evaluated as part of the qualification process. Proposer must furnish a corporate statement concerning its and any of its subproposers' safety records and programs, signed by its CEO/president and furnish OSHA incident rates, reportable incidents and frequency rates.

Proposer must furnish security measures in terms of, encryption, passwords and physical security.

2.2.14. BESS Requirements

Proposers are requested to provide the following information using the template given in Appendix A.

1. Degradation curve information for the battery system proposed.
2. If it is recommended by the battery supplier that cells be changed out at regular intervals given a proposed battery replacement schedule, provide battery replacement costs and a description of escalation factors used to determine actual battery costs at the time of replacement. Provide information on battery replacement procedure, including estimated time to complete replacement.
3. Provide warranty terms and conditions document.
4. Provide recommended spare parts list and prices.
5. Provide a description of all required maintenance activities, including estimated manhours and frequency of occurrence and cost for each activity. Describe the service contract terms.
6. Provide information on AC/AC round trip efficiencies.
7. Provide information showing the length of time the battery can maintain constant output at demand levels less than rated output.
8. Provide information showing the length of time the battery can maintain rated output at a reduced state of charge.
9. Provide information on guaranteed life expectancy to maintain rated capacity as number of discharges or total energy delivered varies.
10. Provide information on the controlling parameters that determine life expectancy for the proposed system.
11. Provide information on required environmental conditions or maintenance procedures (if any) that performance guarantees are based on.
12. Provide information on how the charging cycle changes as maximum demand is reduced.
13. Provide information on the state of charge of the battery as a function of time during the charge cycle.
14. Provide proposed factory and commissioning plans to include performance and "Modes of Operation" testing.
15. Provide a performance curve indicating # of cycles vs. depth of discharge.

2.3. Design Guidelines for Rooftop and/or Ground Mounted and/or Carport Mounted PV.

2.3.1. Design Guidelines for Rooftop PV. Proposer shall develop a design for a new photovoltaic system at the locations identified in the attached drawings. See attached drawings indicating available areas for installation and existing roof structure plans. These drawings are meant for informational purposes only and must be field verified by the proposer.

- Mounting system shall limit roof penetrations and shall be either building integrated roof PV or fully ballasted. Mounting system design needs to meet applicable local building code requirements with respect to snow, wind, and earthquake factors.
- Conduit penetrations shall be minimized.

- If system is not building integrated or membrane sealed, system shall be fixed tilt (minimum 5 degrees tilt for flat roof or flush mounted for sloped roof) with an orientation that maximizes annual energy production.
- All roof access points shall be securely locked at the end of each day.
- System layout shall meet local fire department, code and ordinance requirements for roof access.

2.3.2. Design Guidelines for Ground-Mounted PV. The proposer shall develop a design for a new photovoltaic system at the potential locations identified in the attached drawings. Not all locations need to be utilized. It is the responsibility of the proposer to assess site topography and geotechnical attributes to estimate costs related to project installation.

- Mounting system shall be either directly anchored into the ground (driven piers, concrete footers, etc.) or ballasted on the surface without ground penetration. Mounting system design needs to meet applicable local building code requirements with respect to snow, wind, and earthquake factors.
- Module racking design shall maximize energy production while ensuring resiliency during appropriate weather conditions.
- Ground cover and vegetation management shall be included in the proposal.
- Stormwater management and erosion control management plan shall be included in the proposal.
- OPTIONAL. Gate shall be included in the proposal.
- All lines interconnecting PV arrays to point of interconnection shall be underground.

2.3.3. Design Guidelines for Carport PV. The proposer shall develop a design for a new photovoltaic system at the locations identified in the attached campus drawings for carport installation. Not all locations need to be utilized. It is the responsibility of the proposer to assess site topography and geotechnical attributes to estimate costs related to Project installation.

- Use of existing carports to mount PV is preferred but not necessary.
- Carport PV shall be tilted at a minimum of 5 degrees to allow for drainage and reduce soil build-up.
- The carport PV shall be at least 9 feet clear in all locations.
- Lighting shall be provided under each carport. This lighting shall be efficient (e.g., LED) and allow for adjustable times for illumination with photocell controls to turn the lights on at dusk and off in the morning prior to daylight.
- All lines interconnecting PV arrays to point of interconnection shall be underground.

2.3.4. Performance Criteria. The following performance criteria shall be met for all arrays:

- Power provided shall be 120/240V single phase, and 120/208V, 277/480V three-phase compatible with the onsite distribution system. See attached campus drawings for options for connection voltage and location.
- Proposal shall provide estimated energy delivery for each array, for each month of the year and total for the year at the delivered voltage (120/240V, 120/208V,

277/480V). The estimated aggregated annual energy delivery for all arrays shall be a minimum of 2.2 GWh (AC) per year at point of interconnections (POI).

- Estimated Energy production (hourly annual) shall be provided using PVsyst or other appropriate software tool with prior approved all assumptions disclosed with the report of modeled results P-50 and P-90 hourly. Modeled value will be provided for each array.
- PV array shall mean one or more PV modules having that same orientation and on the same maximum power point tracking (MPPT) system. Every array with differing orientation shall have a separate MPPT system. Provide irradiation zone information.
- All PV hardware components shall be either stainless steel or aluminum. PV structural components shall be corrosion resistant (galvanized steel, stainless steel, composites, or aluminum). No Zinc.
- The project including supports and power conductors, shall not interfere with roof drains, water drainage, expansion joints, air intakes, existing electrical and mechanical equipment, existing antennas, and planned areas for future installation of equipment.
- Production Metering. The project shall have at least one revenue (net) meter installed at each interconnection point. Project will be required to provide revenue grade metering with verifiable production results from any/all arrays at all or any POI. Access to “Real time” monitoring through portal shall be available.

2.3.5. Construction. Perform all construction necessary for the successful installation of the system based upon the design generated from 2.3.1, 2.3.2, and 2.3.3.

2.4. Technical Requirements and Reference Materials

2.4.1. Code Compliance. Installation and equipment shall comply with applicable building, mechanical, fire, arc flash, seismic, structural and electrical codes. The proposers shall ensure the arc flash protection equipped with auto shutoff mechanism for rooftop system. Only products that are listed, tested, identified, or labeled by UL, FM, ETL, or another Nationally Recognized Testing Laboratory shall be used as components in the project. Non-listed products are only permitted for use as project components when a comparable useable listed component does not exist. Non-listed products proposed for use as components must be identified as such in all submittals.

The publications listed below form a part of this document and are hereby incorporated by reference:

- National Electrical Code (NEC)
- UL 1703 Flat – Plate PV Modules and Panels
- UL 1741 – Standard for Static Inverters and Charge Controllers for Use in Photovoltaic Power Systems
- FM Approved – Fire Protection Tests for Solar Component Products
- IEC 62446 Grid Connected Photovoltaic Systems - Minimum Requirements for System Documentation, Commissioning Tests, and Inspections
- IEEE 1547-2018 - IEEE Standard for Interconnection and Interoperability of Distributed Energy Resources with Associated Electric Power Systems Interfaces

Other technical codes that shall apply include:

- ASME PTC 50 (solar PV performance)
- ANSI Z21.83 (solar PV performance and safety)
- NFPA 853 (solar PV systems near buildings)
- IEEE 1547 (interconnections)
- ASCE/ SEI-7 – American Society of Civil Engineers – “Minimum Design Loads for Buildings and Other Structures”.

2.5. Roles and Responsibilities

2.5.1. Proposer. The proposer is required to provide:

- Design concepts
- Construction documents and engineering calculations that are signed and sealed by a licensed architect or engineer
- Submittals for materials and products
- Construction materials, equipment and labor
- Design and construction supervision / contract management
- Quality control plan (QCP)
- Safety plan
- Inspections and tests (per QCP)
- Manuals (design calculations, operation/maintenance, shop drawing, etc.)
- Commissioning of project
- Mentoring and training building operating staff for operation and maintenance
- Operation and Maintenance during the first year and optional service plan after the first year
- Web-based and/or Mobile app monitoring system

2.5.2. Cobb EMC will

- Review for approval design submittals and QCP
- Witness inspections and test witnesses to verify attainment of performance requirements
- Make progress payments for design / construction as agreed

3. Proposal Concept Drawings and Specifications Submissions

3.1. Concept Drawings. The proposer shall provide Cobb EMC with concept drawings with the proposal. The drawings must indicate the proposed location of the PV array(s), BESS, and access points along with a one-line electrical diagram showing inverters, transformers, meters, and interconnection locations. All drawings shall be submitted with dimensions shown in English units in AutoCAD/PDF formats.

3.2. Concept Information. The proposal shall include major equipment information, proposed installation/interconnection information, applicable incentive information, and performance characteristics of the system. Identify an appropriate location for the solar PV and BESS inverter equipment and its related components and environmental control systems that will meet the following criteria:

- Ease of maintenance and monitoring
- Efficient operation
- Low operating losses
- Secured location and hardware
- Compatibility with existing facilities
- Avoidance of flood-prone areas
- Visual harmony

All products shall comply with the technical requirements shown under section 8, "Solar Electric Module Array". At a minimum, the proposed concept information shall include:

Equipment Information:

- System description
- Layout of installation
- Selection of key equipment and layout of equipment
- Performance of equipment components, and subsystems
- Specification for equipment procurement and installation
- All engineering associated with structural and mounting details
- Controls, monitors, and instrumentation
- Operation and maintenance service plan

Installation Interconnection Information:

- Solar electric array orientation (degrees)
- Solar electric module tilt (degrees)
- Electrical grid interconnection requirements
- Integration of solar PV system with BESS and other power sources
- System type and mode of operation (utility interactive)

Performance Characteristics

- Shading calculation documentation
- Total system output
- Estimated kWh/month per array (shown over a 12-month period)
- Normal expected degradation of PV and BESS
- Warranties and guarantees

Applicable Incentives

- Identify all applicable incentives

Interconnection Agreement

- Provide confirmation that the PV systems will be designed to comply with applicable UTILITY interconnection requirements.

4. Design Services

Solar PV and BESS system shall be designed and engineered to maximize the solar and battery storage energy resources, taking into consideration the Cobb EMC's electrical demand and load patterns, proposed installation site, available solar and battery storage resources, existing site conditions, proposed future site improvements, and other relevant factors.

Design Services for this project shall require a schematic design submission, a design development submission, a check set submission and a construction document submission. A final set of as-built drawings shall also be provided to Cobb EMC. These submissions shall be delivered to Cobb EMC based on the project schedule submitted and approved by Cobb EMC. The design package shall include the following details (4.1-4.6).

4.1. Timeline/Project Schedule. Proposer is required to provide an estimate on project timeline and schedule.

4.2. Specifications. A full set of specifications shall express all information and demonstrate sufficient detail so as to direct the construction work outlined in this Statement of Work shall be required. The specifications shall include all equipment information, proposed installation and interconnection information, and performance characteristics of the system.

4.2.1. All drawings, estimates, calculations, and specifications shall be in English units.

4.2.2. The contract shall consider a construction plan producing a minimum disruption of day-to-day activities, utilities, services, etc.

4.3. Construction Drawings

Provide drawings for each discipline required (architectural, structural, electrical, etc.), with separate plans for new work and demolition as well as special types of drawings where necessary, such as enlarged plans, equipment curbing and flashing details, roof penetration details etc. Drawings shall clearly distinguish between new and existing work.

4.3.1. Each drawing shall indicate project title, project number, array identification and location, A/E firm, A/E's address and/or phone number, contract number, drawing title, drawing type, drawing number, and key plan. A cover sheet shall be provided and shall include a list of the drawings, legend, vicinity map, and location map in addition to all items required for each drawing. Each A/E submission shall be clearly dated and labeled (e.g. 75% Design Development Submission, 100% Check Set Submission, Construction Document Submission, As-Built Drawings, etc.). Each drawing sheet submitted shall include a graphic scale in the lower right-hand portion of the sheet. The final set shall be stamped by a registered engineer and/or registered architect for the state of Georgia. At a minimum, the following drawings are required:

- Site plan including utility locations and connections – shall show staging and phasing requirements.
- Electrical plans – including single line diagram and utility interconnection.
- Electrical details.
- Roof plan and/or carport plan – showing the full layout of the system and detailing any obstacles that must be permanently or temporarily removed or relocated.
- Array support and mounting details.

- Any drawings that may be required to install a complete project.
- Water proofing details

4.3.2. The contract documents shall sufficiently define the Statement of Work and shall stand on their own.

4.3.3. Specifically address the means to keep the existing building accessible and operational by means of relocation and/or phasing.

4.4. Calculations. The proposer will provide the following calculations.

4.4.1. System Electrical Calculations. Provide with design development and again with 100% check set.

- PVsyst hourly calculation
- System energy production calculation showing estimated hourly, monthly and yearly energy output for each array
- Energy value and project cash flow
- BESS Watts calculation showing estimated watt-hour energy storage capacity including DoD, degradation curve, etc.

4.4.2. If rooftop PV arrays are proposed, include roof structural loading calculations. These calculations shall specifically address roof loading from the PV array and confirmation that the loading does not exceed existing roof framing capacity as determined by your analysis.

4.4.3. If carport PV arrays are proposed, include carport structural loading calculations. If existing carports are to be used, these calculations shall specifically address existing carport loading from the PV array and confirm that the loading does not exceed existing carport capacity as determined by your analysis. If new carports are proposed, include structural calculations for the proposed design.

4.5. Registration Seals. Each final working drawing and each submitted specification and calculation document shall be signed by, bear the seal of, and show the state certificate number of the architect and/or engineer who prepared the document and/or is responsible for its preparation.

5. Design Submissions

Awarded proposer will secure from governing agencies and the utility company all required rights, permits, approvals, and interconnection agreements at no additional cost to Cobb EMC. The awarded Proposer will complete and submit in a timely manner all documentation required to qualify for available rebates and incentives.

5.1. Design Reviews. For each design / drawing submissions, Cobb EMC reserves the right to make comments and request changes after the receipt of the submission. Reviews will be made by Cobb EMC staff. As part of its review, Cobb EMC may offer submission reviews to local code officials. Cobb EMC shall provide review comments within ten (10) business days of receipt of the 75% Design Development Submission and the 100% Check Set Submission.

5.2. Purpose. Cobb EMC will review the proposer design submissions to verify adherence to contract requirements. Design reviews by Cobb EMC are not to be interpreted as resulting in an approval of the proposer's apparent progress toward meeting contract requirements but are intended to discover any information that can be brought to the proposer's attention that might prevent errors, misdirection, or rework later in the project. The proposer shall remain completely responsible for designing, constructing, operating and maintaining the project in accordance with the requirements of this Statement of Work.

5.3. Resolution of Comments. The proposer shall respond to all design review comments in writing, indicating one of the following: (1) adoption and action taken, (2) adoption with modifications and action taken, (3) alternative resolution and action taken, or (4) rejection. In cases other than unqualified adoption, the proposer shall provide a statement as to why the reviewer's comment is inappropriate. If the proposer believes that any Cobb EMC design comments or requested changes will result in a change in the contract cost, they shall notify Cobb EMC within seven calendar days of receiving the comment(s) and provide a detailed cost estimate of anticipated contract modifications. Rejection items shall not go forward to the construction phase until adequate resolution to the rejected item has been approved by Cobb EMC. Design review comments shall not relieve the proposer from compliance with terms and conditions of this contract. The proposer's comment resolution shall be transmitted to Cobb EMC within five (5) business days of comment receipt and incorporate discussions from the scheduled design comment review meetings.

6. Utility Interconnect Agreement

6.1. The proposer shall coordinate with Cobb EMC to ensure that the project satisfies all UTILITY criteria for interconnection of the project to the electric distribution system. This includes coordinating all negotiations, meeting with Cobb EMC, design reviews, and participating in any needed interactions.

6.2. The proposer shall manage interconnection and startup of project in coordination with Cobb EMC.

7. Quality Control Plan

7.1. Content. For each performance and installation requirement, the QCP shall identify: item/system to be tested, exact test(s) to be performed, measured parameters, inspection/testing organization, and the stage of construction development when tests are to be performed. Each inspection/test shall be included in the overall construction schedule. The proposer is not relieved from required performance tests should these not be included in the plan.

The QCP is intended to document those inspections and tests necessary to assure Cobb EMC that product delivery, quality and performance are as required. It also serves as an inspection coordination tool between the proposer and Cobb EMC. Results from tests and inspections shall be submitted within 24 hours of performing the tests and inspections.

At a minimum, the QCP should conform to "IEC 62446 Grid Connected Photovoltaic Systems - Minimum Requirements for System Documentation, Commissioning Tests, and Inspections (2009)".

Performance tests will be conducted at the final commissioning/acceptance testing, and one year after the acceptance date. Performance tests will include I-V curve traces for all PV strings. For project acceptance, measured performance at maximum power point must be at least 90% of expected performance, which will be adjusted for concurrently measured cell temperature and plane of array (POA) irradiance. This can be accomplished using a current industry standard I-V curve tracer with capability to compare measured PV string I-V curves with nameplate performance of PV string compensated for concurrent cell temperature and POA irradiance measurements. If performance is less than 90% at the one-year performance tests (measured using the same method as for project acceptance), proposer shall promptly troubleshoot and correct any malfunction or issues as necessary to return project to 90% measured performance or better. The proposer shall supply Cobb EMC with detailed documentation of malfunction or errors and all corrective actions taken.

Additional performance test will be defined in a final EPC contract to be provided for review at a later time.

7.2. Submissions. The QCP shall be prepared and submitted within fifteen (15) business days of the post award conference meeting and prior to any construction on-site. The QCP may be rejected as incomplete and returned for resubmission if there is any performance, condition or operating test that is not covered therein.

7.3. Updating. During construction, the proposer shall update QCP if any changes are necessary due to any changes or schedule constraints. Cobb EMC shall be notified immediately of any schedule and/or procedural changes.

8. Solar Electric Module Array

8.1. Photovoltaic Modules

- 8.1.1.** System PV modules shall be a commercial off-the-shelf product, shall be UL listed, and shall be properly installed according to manufacturer's instructions, NEC, and as specified herein. Tier 1 modules to be reviewed and approved by Cobb EMC.
- 8.1.2.** The PV modules shall be installed such that the maximum amount of sunlight available year-round on a daily basis should not be obstructed. At a minimum, all PV arrays shall be shade free from 9 a.m. until 3 p.m. (solar time). All projects must include documentation of the impact from any obstruction on the seasonal or annual performance of the solar electric array and shall be included in PVSyst model results.
- 8.1.3.** System wiring shall be installed in accordance with the provisions of the NEC.
- 8.1.4.** All modules installed in a series string shall be installed in the same plane/orientation.
- 8.1.5.** PV modules shall have a 25-year limited warranty that modules will generate no less than 80% of annual rated output under STC. PV modules that do not satisfy this warranty condition shall be replaced. Cobb EMC retains the right to approve all equipment including proposed modules.
- 8.1.6.** Panel installation design shall allow for the best ventilation possible of panels to avoid adverse performance impacts.

- 8.1.7. Provide Cobb EMC with 1% extra PV spare panels.
- 8.1.8. Warranty. Provide a panel manufacturer's warranty as a minimum. PV modules shall have a 25-year limited warranty guarantying a minimum performance of at least 80% of the original power for at least twenty-five (25) years. Measurement made under actual installation and temperature will be normalized to standard test conditions using the temperature and coefficients published in the module specifications.

8.2. Inverter and Controls

- 8.2.1. Each inverter and associated controls shall be properly installed according to manufacturer's instructions.
- 8.2.2. Inverters shall be commercial off-the-shelf product, listed to UL 1741 and IEEE 1547. Cobb EMC retains the right to approve all equipment. The inverter shall have at a minimum the following features:
 - UL/ETL listed
 - Peak efficiency of 96% or higher
 - Inverter shall have operational indicators of performance and have built-in data acquisition and remote monitoring.
 - The inverter shall be capable of parallel operation with the existing AC power. Each inverter shall automatically synchronize its output waveform with that of the utility upon restoration of utility power.
- 8.2.3. Warning labels shall be posted on the control panels and junction boxes indicating that the circuits are energized by an alternate power source independent of utility-provided power.
- 8.2.4. Operating instructions shall be posted on or near the system, and on file with facilities operation and maintenance documents.
- 8.2.5. Provide detailed lock out /tag out instructions for all equipment.
- 8.2.6. Power provided shall be compatible with onsite electric distribution systems.

All the installations will be done in accordance with the manufacturer's specifications.
- 8.2.7. The inverter and system shall utilize an astronomical timer or other means to shut down the inverter during night time to avoid energy usage at night.
- 8.2.8. Warranty. A 10-year manufacturers' warranty shall be provided.

8.3. Control Panel to BESS/Solar Electric Array Wire Runs

- 8.3.1. Areas where wiring passes through ceilings, walls or other areas of the building shall be properly restored, booted, sealed and returned to their original condition. Any outdoor cables will be secured in a water sealed encased duct system.

- 8.3.2. All wiring between carports and the point of interconnection shall be underground and meet applicable codes.
- 8.3.3. Thermal insulation in areas where wiring is installed shall be replaced to “as found or better condition.” Access doors to these areas shall be properly sealed and gasketed.
- 8.3.4. All field electrical devices shall have the capability to be locked as appropriate.

8.4. PV Monitoring

- 8.4.1. The PV/BESS systems installed shall provide for monitoring by Cobb EMC.
- 8.4.2. Monitor by an IP addressable device and displayed graphically in a user-friendly manner the following parameters:
 - AC energy
 - Solar irradiance
 - Show status of all equipment
 - Provide electrical one line showing operation and performance of all equipment

Data shall be available both in real time and in archived in a minimum of 5-minute intervals. All monitoring hardware and monitoring equipment shall be provided by the proposer and approved by Cobb EMC.
- 8.4.3. Provide networking equipment, engineering, programming, wiring, and software to allow remote connection by Cobb EMC to the local area network.
- 8.4.4. Meters utilized for the project shall be UL listed, and shall comply with UTILITY net energy metering requirements.
- 8.4.5. Meters shall be installed in the main distribution panel (MDP) when possible. Meters shall not be mounted to the transformer housing without prior approval when there is no other reasonable place to mount it.

8.5. Structural Requirements

- 8.5.1. All structures, including array structures, shall be designed in accordance with all applicable state and local codes and standards.
- 8.5.2. The proposer shall provide structural calculations, stamped by a licensed professional structural engineer in the state of Georgia.
- 8.5.3. All structural components shall be non-corrosive (galvanized steel, stainless steel or aluminum). All hardware shall be stainless steel or aluminum. All components shall be designed to obtain a minimum 40-year design life.
- 8.5.4. All roof penetrations shall be designed and constructed in collaboration with the roofing professional or manufacturer responsible for the roof and roofing material warranty for the specific site. The number and size of the penetrations necessary to extend the power and control cable into the building must be kept to a minimum and grouped in a single

location when practicable. All roof installations and weather proofing of penetrations shall not compromise the roof warranty, or if roof has no warranty, accepted best practice. The roof penetrations and roof connections shall be warranted for weather tightness for ten (10) years from the installer including parts and labor.

- 8.5.5.** Rooftop installations where there is no parapet, or the parapet is less than 42", a 6' safety zone from the roof edge to the PV system shall be maintained. A 3' clear path of travel shall be maintained to and around all rooftop equipment. Design shall address access for maintenance and replacement of the equipment. Appropriate fall protection or temporary platforms shall be incorporated into the design to allow for this maintenance and replacement work. If the inverters are mounted on the roof this equipment shall have permanent access walkways installed to facilitate monitoring and maintenance.

8.6. Attachment to Roof

The system shall be mounted using the best means practicable, such as direct attachment or a fully ballasted system. All penetrations and structural connections associated with supports and conduit shall be kept to a minimum and shall be water-proof.

- 8.7. Lightning Protection.** Provide surge protection on all electrical systems.

- 8.8. PV System Installation Warranty.** The PV systems shall carry a ten (10) year workmanship warranty by both the manufacturer and the installer including parts and labor.

9. Shop Drawings/Product Data

- 9.1. Submissions.** The Proposer shall submit shop drawings and product data / submittals, catalog cuts, etc. as stipulated herein. Shop drawing/product data submissions to Cobb EMC shall be made after review and approval by the proposer. All approved product data and shop drawings shall be delivered to Cobb EMC in one submission electronically.

The proposer shall combine all product data submission material into hard copy manuals for reference during all phases of construction. Shop drawings shall be bound with product data.

- 9.2. Reviews.** Reviews of shop drawings and product data by Cobb EMC are not to be interpreted as an approval of the Proposer's product selections. The proposer shall remain completely responsible for constructing the PV system in accordance with all contract performance requirements.

- 9.3. Products for Submission.** The proposer shall provide shop drawings and product data for all systems, equipment and materials.

10. Inspections and Tests

- 10.1. General.** The proposer shall perform inspections and tests throughout the construction process including: existing conditions/needs assessments, construction installation placement/qualification measurements and final inspections/tests performance certification. Periodic "quality" inspections shall also be conducted to support progress payments as identified in the proposer's QCP.

- 10.2. Cobb EMC Witness.** All inspections and tests, to verify documented contract assumptions, to establish work accomplishment, or to certify performance attainment shall be witnessed by Cobb EMC and/or construction management (CM) and coordinated through the QCP.
- 10.3. Final Inspections and Tests.** In order to ensure compliance with provisions of the NEC, an inspection by a licensed electrical inspector is mandatory after construction is complete. Unless otherwise identified, manufacturer recommendations shall be followed for all inspection and test procedures. The NEC inspection shall be conducted by an independent third party electrical inspector familiar with PV systems. Provide qualifications of the proposed third party inspector for review and approval prior to conducting the NEC inspections.
- Tests shall include a commissioning of the array. Commissioning tests shall conform with the requirements in Section 7 (QCP). Commissioning shall be performed for the entire PV system. This data shall be used to confirm proper performance of the PV system.
- 10.4. Documentation.** Inspections/tests required in the QCP shall result in a written record of data/observations. The Proposer shall provide two (2) copies of documents containing all test reports/findings. Test results shall typically include: item/system tested, location, date of test, test parameters/measured data, state of construction completion, operating mode, proposer inspector/Cobb EMC witness, test equipment description and measurement technique.

11. Project Closeout

- 11.1. Preparation for Final Inspection and Tests.** The following steps shall be taken to assure the project is in a condition to receive inspections and tests.
- Finalize record drawings and manuals, indicating all "as-built" conditions.
- 11.2. Record Drawings.** The proposer shall maintain on site the working record drawings of all changes/deviations from the original design. Notations on record drawings shall be made in erasable red pencil or other color to correspond to different changes or categories of work. Marked-up drawings shall always be maintained at the proposer's on-site construction office, available for Cobb EMC and/or CM to review. Record drawings shall note related change order designations on impacted work. When shop drawings indicate significant variations over design drawings, shop drawings may be incorporated as part of record drawings. Review of record drawings may be required before payments can be processed.
- 11.3. As-Built Drawings and Specifications.** The Proposer shall provide "as-built drawings" and documents based upon actual site installation. Should Cobb EMC determine that variations exist between finished construction and the as-built drawings, the proposer shall correct drawings to the satisfaction of Cobb EMC.
- The proposer shall submit six (6) hard copies and electronic copies containing the "as-built" drawings and specifications as CAD and PDF files.
- 11.4. Warranties and Guarantees.** Submit specific warranties and guarantees, final certifications and similar documents to Cobb EMC upon substantial completion and prior to final payment. Include

copies with operations and maintenance manual. All warranties shall be signed by a principal of the proposer's firm and sealed if a corporation.

- 11.5. Maintenance Manual.** Provide a detailed operation and maintenance manual including diagram of system components, description of normal operation; description of operational indicators and normal status of each, table of modes of operation, safety considerations, preventative maintenance requirements, troubleshooting and corrective actions; sources of spare parts and cut-sheets for all components. The proposer shall prepare six (6) hardcopies and electronic copies containing the detailed Maintenance Manual. Submit to Cobb EMC.
- 11.6. Spare Parts.** The proposer shall provide a recommend list of spare parts. At the minimum a set of combiner box fuses for each array shall be provided along with the required spare panels noted in Section 8.
- 11.7. Demonstration and Training.** Provide Cobb EMC approved training for designated personnel in the operation of the entire photovoltaic/BESS energy storage system, including operation and maintenance of inverter(s), transfer switches, panel board, disconnects and other features as requested by Cobb EMC. Instruct the designated Cobb EMC personnel in removal and installation of panels, including wiring and all connections. Provide Cobb EMC with written instructions and procedures for shut-down and start-up activities for all components of the system. Cobb EMC shall be permitted to video tape this training for official use.

12. Operations and Maintenance Service

Provide operation and maintenance of the solar array/BESS systems for one year. Work shall include all manufacturer recommended maintenance as well as a 12-month performance commissioning as outlined in in section 7.1 (QCP). Cobb EMC shall be invited to witness all performance commissioning. A maintenance log shall be maintained to note dates, equipment and issues being resolved. Proposer should be available within 48 hours to respond to natural disasters (extreme storm, hail, wind events) to inspect array for damage.

13. Cost Proposal

- 1) Cobb EMC or designee will be the owner of the solar PV and BESS system.
- 2) The bidding proposers will also provide the total installation cost of the solar PV and/or BESS systems. The final total indicated on the cost proposal shall include all costs associated with completing the work, for the staff and manpower projections provided.
- 3) The battery Energy Storage System (BESS) contract will be paid as a fixed price contract. All the expenses incur shall be included in the proposed fixed contract. Any other jointly approved expenses will be reimbursed separately.
- 4) Respondent shall provide a separate Cost Proposal clearly indicating material and labor cost for both Solar PV and BESS projects.
- 5) Total bid price of project including operation and maintenance for the first year and optional service plan after the first year.
- 6) Provide payment schedule in which the last project payment of 10% due after six months of expected performance.

- 7) Respondents shall include price proposals, which at a minimum include the following line items for both Solar PV and BESS projects:
- System equipment, designed, delivered, installed, tested and commissioned
 - Maintenance service schedule and cost estimates
 - Extended warranty offering (in addition to 5-year base warranty)
 - Recommended spare parts, including typical replacement schedule
 - Uptime guarantee
 - Training and support for Cobb EMC operations personnel

14. Proposal Submission Instructions

14.1. Proposal Format

Except as noted below, proposal summary information must be supplied electronically in Microsoft Word documents as outlined in “Appendix A” in addition to the information requested in sections 2-13 of this RFP.

Proposals received without the above electronic files will be considered incomplete and will be rejected.

14.2. Transmittal Instructions

Proposals are due no later than 12 noon EST on January 14, 2019. Proposals must be submitted electronically by email on the due date. Any supplemental information must be submitted electronically in Microsoft Word format by email on the due date.

Cobb EMC requires the proposers to submit as part of their proposal, a list of any exceptions to the requirements set forth in the RFP (Sections 2-12).

RFP questions and final proposals should be sent to cobb.der@cobbemc.com.

Include the words “Cobb EMC Solar PV and BESS RFP” in the subject line.

The electronic proposal must be followed up with a signed original cover letter and one (1) paper copy of all submitted, material delivered by mail or courier within one week of the proposal due date. The mailed or couriered material should be sent to:

Mr. Manish Murudkar
Cobb EMC
1000 EMC Pkwy, Building 4000
Marietta GA 30060
Phone: (678) 355-3731

- 14.3.** A full listing of all persons to be assigned to the project, including all sub consultants, including the following:
- a) Individuals’ resumes including work performed on all projects of similar scope and scale over the past five (5) years.
 - b) Each Individual’s qualifications for the project including a listing of all Georgia Registrations by discipline, licenses, or other documentation of qualifications. The skill sets of the engineering team should cover the entire scope of work required.

- c) The proposer shall state which of these team members are direct employees of the vendor and which are subcontracted or casual resources. It is required that the team presented in the proposal will be the team assigned to the project if the engineering firm is awarded the project unless changes are agreed to by Cobb EMC in writing.

15. RFP and Proposal Terms

Acceptance or Rejection of Proposals

Cobb EMC reserves the right, without qualification, to select or reject any proposals. Cobb EMC may request additional information to complete its evaluations. Persons who submit proposals do so without recourse against Cobb EMC for rejection or failure to execute an agreement for any reason. Cobb EMC will not reimburse any cost incurred in the preparation or submission of a proposal or any subsequent negotiations regarding a proposal. Cobb EMC reserves the right to terminate this RFP process at any time, without notice and with no obligation to purchase or continue negotiations.

Confidentiality

Cobb EMC will use reasonable efforts to protect proposer's confidential information provided that such information is clearly identified as follows:

- Mark "Confidential Information" on each page containing such information; and
- Highlight or shade the specific confidential information on the marked page.

A blanket statement that an entire page or the entire proposal is confidential will not be considered clear indication and may result in rejection of the proposal.

Notwithstanding the foregoing, Cobb EMC may disclose information that has been designated as confidential if Cobb EMC determines, in its sole discretion, that disclosure is necessary to comply with any applicable law or order of a governmental authority with competent jurisdiction. Cobb EMC reserves the right to disclose proposals to its consultants, counsel or financiers for the purpose of assisting Cobb EMC in evaluating proposals.

16. Evaluation Criteria

Proposed Decision Matrix for BESS	
Technical Feasibility	
1	Cycle Life and Calendar Life.
2	Depth of Discharge (DoD) over 10-year period.
3	Battery Monitoring System (BMS) or SCADA Integration for monitoring voltage, current, power, PF, DC voltage and current, temp, remaining capacity, and reporting system alarms for battery failures, etc. Ability to securely remote access and download reports.
4	Round trip efficiencies
5	The length of time the battery can maintain rated output at a reduced charge.
6	Guaranteed life expectancy to maintain rated capacity.
7	Maintenance needs of the technology and warranties.
Total Cost of Ownership	
8	What is the total cost of ownership including initial cost, maintenance cost, replacement cost, and warranty costs, guarantee costs, etc. Itemize each cost.
Financial Stability	
9	The vendor and major equipment subcontractors must be financially stable companies capable of providing long term service of the BESS and meeting warrantee obligations. Please provide documentation with regard to financial stability.
Project Plan	
10	Deliver a complete project implementation plan. Completeness and description of a well thought-out and well-presented project plan tailored to the specific Cobb EMC project objectives. The proposal shall clearly explain that the BESS meets the Cobb EMC requirements and, as needed, shall explain how the requirements are met. The project will include but not limited to various items such as description of deliveries, milestones, implementation & maintenance schedule, testing, quality control, resources, support, training, drawings, documentation, and any other services.
Previous Experience & References	
11	Previous work experience in successfully delivering battery energy storage solutions of similar size and technology. Please provide references. Feedback from past customers shall be taken into consideration. Cobb EMC may reach out to references provided by the vendors.
Support	
12	Ongoing system support and services. Vendor’s ability to provide emergency response service in a short amount of time after an issue with the BESS is detected. Service organization, infrastructure, location and response time will be taken into consideration.

Proposed Decision Matrix for Solar PV	
Technical Feasibility	
1	Capacity Factor, System Losses, Solar Efficiency
2	Design Configuration.
3	How specific site issues and requirements will be addressed.
4	Amount of energy generated on an average hourly, monthly, and annual basis over the term of the agreement, including a degradation factor.
5	Quality of Components and Performance Plan. Guaranteed life expectancy to maintain rated capacity.
6	Plan to handle the risk under unexpected circumstances.
7	Maintenance needs of the technology and warranties.
8	Solar PV Monitoring system
9	kW/Sq. Foot, Module Type, Array Type
10	System PV System Compliance and Resiliency
Total Cost of Ownership	
11	What is the total cost of ownership including initial cost, maintenance cost, replacement cost, and warranty costs, guarantee costs, etc. Itemize each cost.
Financial Stability	
12	The vendor and major equipment subcontractors must be financially stable companies capable of providing long term service of the solar PV and meeting warrantee obligations. Please provide documentation with regard to financial stability.
Project Plan	
13	Deliver a complete project implementation plan. Completeness and description of a well thought-out and well-presented project plan tailored to the specific Cobb EMC project objectives. The proposal shall clearly explain that the BESS meets the Cobb EMC requirements and, as needed, shall explain how the requirements are met. The project will include but not limited to various items such as description of deliveries, milestones, implementation & maintenance schedule, testing, quality control, resources, support, training, drawings, documentation, and any other services.
Previous Experience & References	
14	Previous work experience in successfully delivering solar PV solutions of similar size and technology. Please provide references. Feedback from past customers shall be taken into consideration. Cobb EMC may reach out to references provided by the vendors.
Support	
15	Ongoing system support and services. Vendor's ability to provide emergency response service in a short amount of time after an issue with the BESS is detected. Service organization, infrastructure, location and response time will be taken into consideration.

Appendix A - List of RFP Documents

1. Notice of Intent to Respond
2. Proposer Qualification Form
3. Solar PV Project Summary
4. Solar PV Pricing, Combined Solar/BESS Pricing, and Expected Energy
5. Solar PV Technical Description
6. Solar PV or BESS Construction Milestones
7. Solar PV Monthly and Annual Energy Production
8. BESS Project Summary, Pricing and Key Specifications

1. Notice of Intent to Respond

Notice of Intent to Respond		
Company Name		
Address		
City	State	Zip
Company Representative Name		
Signature		
Email	Phone Number	Fax Number
Project Name	Resource	
	<input type="checkbox"/> Solar PV <input type="checkbox"/> BESS <input type="checkbox"/> Solar PV/BESS combined	
Nameplate Capacity MW (AC)	Annual Capacity Factor (% Nameplate)	Expected Annual MWh (at Point of Delivery)
	Proposed Commercial Operation Date	PPA-Contract Terms (years)
Notes (as appropriate)		

2. Proposer Qualification Form

If your proposal scope is limited to solar PV only, please provide the information described below.

If your proposal scope includes both solar PV and energy storage, please provide documentation for both technology offerings.

A. COMPANY (PROPOSER) INFORMATION

B. FINANCIAL INFORMATION

C. INSURANCE

D. SERVICES PROVIDED

D.1 Please list your top three customers (work experience references) that you have performed work for in the solar PV and/or energy storage field.

Company Name	Contact Name	Contact Phone	Contact Email

D.2 Please list your top three suppliers (work experience references) that have performed work for you or provided solar PV and/or energy storage equipment to your projects.

Company Name	Contact Name	Contact Phone	Contact Email

D.3 What type of work does your company typically self-perform versus subcontract for this type of project?

E. Proposer Solar PV and/or Battery Energy Storage Experience: The proposers will provide detail description of their battery use cases with model results. Please provide battery/solar control system descriptions especially on how it supports use cases.

List 3 major relevant projects (completed or ongoing)

Project #1	
Name of solar PV or BESS project	
Project Owner	
Project Owner Contact Information	
Proposer's Role (Prime/Subcontractor/other)	
Name of Prime Proposer (if by others)	
Project Location (Country, State, County, City)	
Proposer Scope of Work	
Project Duration	
Project Completion Date	
Project #2	
Name of solar PV or BESS project	
Project Owner	
Project Owner Contact Information	
Proposer's Role (Prime/Subcontractor/other)	
Name of Prime Proposer (if by others)	
Project Location (Country, State, County, City)	
Proposer Scope of Work	
Project Duration	
Project Completion Date	
Project #3	
Name of solar PV or BESS project	
Project Owner	
Project Owner Contact Information	
Proposer's Role (Prime/Subcontractor/other)	
Name of Prime Proposer (if by others)	
Project Location (Country, State, County, City)	
Proposer Scope of Work	
Project Duration	
Project Completion Date	

3. Solar PV Project Summary

Solar Project Summary				
Project/Facility Name				
Proposer Contact				
Name				
Company				
Address				
Phone/Fax				
Email				
Alternate Contact				
Name				
Company				
Address				
Phone/Fax				
Email				
Technology Type	Facility Nameplate Capacity			
Photovoltaic Solar	kW (AC)		kW (DC)	
First Year Generation At delivery point		MWh	Capacity Factor	%
Proposed Commercial Operation Date				
Proposed PPA Term (years)				
Point of Delivery Description				
Point of Delivery is on the	<input type="checkbox"/> Distribution System <input type="checkbox"/> Other			
Proposed Facility Status	<input type="checkbox"/> Qualifying Facility <input type="checkbox"/> Exempt Wholesale Generator			
Estimated Useful Life of Facility at Commercial Operation Date (years)				

4. Solar PV Technical Description

Solar Technical Description				
Module Level Information				
Manufacturer				
Model Number				
Module Rating at STC*				
Cell Material				
Total Number of Modules				
State and/or Country of Origin				
Array Level Information				
Number of Modules per String				
Strings in Parallel				
Total Active Surface Area (m ²)				
Inverter Information				
Manufacturer				
Model Number				
Total Number of Inverters				
Confirm that inverters meet applicable UL, IEEE, IEC standards. <input type="checkbox"/> Yes <input type="checkbox"/> No Confirm that the facility meets NEC 2014. <input type="checkbox"/> Yes <input type="checkbox"/> No				
Mounting/Orientation				
<input type="checkbox"/> Fixed		Azimuth (deg)		Elevation (deg)
<input type="checkbox"/> 1-Axis Tracking		Azimuth (deg)		Elevation (deg)
<input type="checkbox"/> 2-Axis Tracking				
Facility Level Information				
Annual Plant Availability (percent)				
Ground Coverage Ratio				
Estimated Land Area (acres)				
Consumptive Water Use (gallon/MWh)				
*Standard Test Conditions (25°C, 1 kW/m ² , AM 1.5)				
Notes to PV Technical Description				

5. Solar PV/BESS Project Plan, Schedule and Construction Milestones

The Solar PV/BESS proposer shall provide a proposed schedule with their proposal. The schedule shall include design, fabrication, delivery, on site construction and testing phases with subtasks and milestones as needed. The schedule will be discussed and finalized between the proposer and Cobb EMC prior to the final award of this project.

6. Solar PV Monthly and Annual Energy Production

- A) Provide the month's total expected average generation.
- B) Indicate the average expected hourly generation from the proposed project by month and time of day.
- C) To the extent the sum of the values in the grid are different from the first year Expected Energy value on Form 3, explain the cause of the difference in the Notes section below.
- D) Expected energy production should be gross of any expected annual plant degradation. Time is hour ending Eastern Standard Time. (Do not adjust for Daylight Savings Time.)

Monthly and Annual Energy Production												
Expected hourly generation (MWh)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Max												
Average (P50) Expected hourly generation (MWh)												
HE (EST)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												
21												
22												
23												
24												
Sum												
% of Total												
Total												
Notes to Energy Production Profile												

<p>Expected Annual Availability (% of hours able to produce energy at full capacity under ambient conditions): _____</p> <p>Guaranteed Annual Availability (% of hours able to produce energy at full capacity under ambient conditions): _____</p>

7. BESS Pricing, Project Summary and Key Specifications

Proposers are encouraged to offer any options that could add further value, including technology, cost savings, schedule reductions or other value-added insights from its experience that could assist Cobb EMC as Buyer.

A. BESS Project Summary

BESS Project Summary	
Project/Facility Name	
Proposer Contact	
Name	
Company	
Address	
Phone	
Email	
Alternate Contact	
Name	
Phone	
Email	
Energy Storage Technology	
Proposed Commercial Operation Date	
Proposed LTESA Term (years)	
Point of Delivery Description	
Point of Delivery is on the	<input type="checkbox"/> Distribution System <input type="checkbox"/> Other
Estimated Useful Life of BESS at Commercial Operation Date (years)	

B. BESS Technical Description

BESS Technical Description	
Battery Information	
Manufacturer	
Model Number	
State and/or Country of Origin	
Control System Information	
Manufacturer	
Description	
Inverter Information	
Manufacturer	
Model Number	
Total Number of Inverters	

Confirm that inverters meet applicable UL, IEEE, IEC standards. <input type="checkbox"/> Yes <input type="checkbox"/> No	
Confirm that the facility meets NEC 2014. <input type="checkbox"/> Yes <input type="checkbox"/> No	
Facility Level Information	
Annual ESS Availability (percent)	
Estimated Land Area (acres)	
Notes to ESS Technical Description	

Key Specifications

Specification Parameters	Description	Unit	Value
Rated Continuous Discharge Power	The rate at which the BESS can continuously deliver energy for the energy storage component's entire specified SOC range.	kw	
Rated Apparent Power	The real or reactive power (leading and lagging) that the ESS can provide into the AC grid continuously without exceeding the maximum operating temperature of the BESS.	kVA	
Rated Continuous Charge Power	The rate at which the BESS can capture energy for the energy storage component's entire SOC range.	kW	
Rated Continuous AC Current	The AC current that the BESS can provide into the grid continuously and can be charged by the grid continuously without exceeding the maximum operating temperature of the BESS.	A	
Output Voltage Range	The range of AC grid voltage under which the BESS will operate in accordance with the BESS specification.	V	
Output Voltage Range	The range of AC grid voltage under which the BESS will operate in accordance with the BESS specification.	V	
Total Response Time	The response time shall be measured in accordance with figure below starting when the signal (command) is received at the BESS boundary and continuing until the BESS discharge power output (electrical or thermal) reaches 100 ± 2 percent of its rated power.	Chart	
System Round Trip Efficiency	Total round-trip efficiency from beginning of life (BOL) to end of life (EOL), defined as the ratio of the delivered output energy of the energy storage system to the absorbed input energy required to restore it to the initial state of charge under specified conditions.	%	
Ramp Rate	The maximum rate, expressed in megawatts per minute, that the BESS can change its input and output power. This may vary in multiple dimensions such as state of charge (SOC) and/or other parameters of the system that may be broken out into multiple line item values.	kW/min	
Enclosure Type	A description of the system enclosure including that supplied with the system, provided as a part of the site installation and/or comprised of building assemblies associated with the installation. Examples include building, containerized—both stationary and transportable.		

Cobb EMC 1.5 MW Solar PV and 1 MW/4 MWh BESS RFP

Equipment Footprint	Length x Width (L x W) of equipment only (includes BESS and all ancillary units as required) in intended layout	ft ²	
Height	Equipment height plus safe clearance distances above the equipment.	ft - in	
Weight	Weight per individual sub-system (PCS, BESS, accessories, etc.), including maximum shipping weight of largest item that will be transported to the project site.	lbs	
Grid Communication Protocols/Standards	List of codes/standards with which the BESS is compliant.		
Rated Discharge Energy	Specify the accessible energy that can be provided by the BESS at its AC terminals when discharged at its beginning of life (BOL) and end of life (EOL).	kWh	
Minimum Charge Time	The minimum amount of time required for the BESS to be charged from minimum SOC to its rated maximum SOC.	Hr	
Typical Recharge Time	This should include any time for rest a period needed between a full or partial charge or discharge cycle.	Hr	
Warranty & Replacement Schedule	Specify warranty inclusions and exclusions, include replacement schedules. Include timespan of warranty and any limitations.		
Expected Availability of System	Percentage of time that the system is in full operation performing application specific functions taking into account both planned and unplanned down-time.	Hr/yr	
Additional information as needed.			