



GUAM POWER AUTHORITY

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October 5, 2023

AMENDMENT NO.: XII

TO

INVITATION FOR MULTI-STEP BID NO.: GPA-012-23

FOR

RENEWABLE ENERGY RESOURCE ACQUISITION PHASE IV

Prospective Bidders are hereby notified of the following responses to clarification of Amendment No.: X of Bidder No.: 1 dated September 25, 2023 and September 27, 2023, Bidder No.: 10 dated September 25, 2023 and September 27, 2023, Bidder No.: 6 dated September 26, 2023 and September 28, 2023:

Bidder No.: 1 dated 09/25/2023:

QUESTION:

1. [Clarification #1](#)

(Page 5 of 17)

ANSWER:

- 1) For a 60 MW (AC) project, the BESS should be capable of delivering 30 MW (AC) power to the GPA grid. The actual power dispatched from the BESS shall be the total stored energy distributed over 12 hours less any energy required to support the grid functions. Bidders shall be responsible for meeting these criteria in their design. The PSCC operators may require dispatching up to 30 MW (AC) over a shorter period of time.
- 2) For a 30 MW (AC) project, the BESS should be capable of delivering 15 MW (AC) power to the GPA grid. The actual power dispatched from the BESS shall be the total stored energy distributed over 12 hours less any energy required to support the grid functions. Bidders shall be responsible for meeting these criteria in their design. The PSCC operators may require dispatching up to 15 MW (AC) over a shorter period of time.

- 3) For a 5 MW (AC) project, the BESS should be capable of delivering 2.5 MW (AC) power to the GPA grid. The actual power dispatched from the BESS shall be the total stored energy distributed over 12 hours less any energy required to support the grid functions. Bidders shall be responsible for meeting these criteria in their design. The PSCC operators may require **dispatching up to 2.5 MW (AC) over a shorter period of time.**

CLARIFICATION: Regarding "dispatching up to 2.5 MW (AC) a shorter period of time", isn't there minimum time required, for example, dispatching up to 2.5 MW (AC) for at least 4-hour?

ANSWER:

There isn't an established minimum time, however, the GPA Power System Control Center operators will try to dispatch all of the stored energy to the GPA grid subject to the power system demand.

QUESTION:

2. [Clarification #2](#)

(Page 6 of 17)

ANSWER:

The energy from the batteries must still be converted to AC by the PCS before it is delivered to GPA's grid. Therefore, the eventual path through a PCS is not eliminated by the requirement to DC-couple 50% of the resource to the energy storage system. The energy-shifted PV resource shall be DC-coupled to the ESS. The ESS shall then be connected to the PCS and then connected to the GPA grid. Only the ramp-controlled PV resource shall be connected to PV inverters and then connected to the GPA grid.

CLARIFICATION: We have an experience of PV-BESS system which has similar configurations above. However, it was the PV-BESS located behind the meter. For the front meter utility system, we need review and confirmation from manufacturers. Thus, please allow the Bidders to have 6-7 weeks extension for technical bid submission.

ANSWER:

Kindly refer to *Amendment No.: XI* dated September 28, 2023.

QUESTION:

3. [Clarification #3](#)

(Page 10 of 17)

ANSWER:

- 1) The DC meter shall comply with ANSI C12.32 standard for revenue grade DC metering.
- 2) A meter is required after the PV inverters as well as after the PCS to monitor the outputs of the ramp-controlled PV and energy-shifted PV. GPA also intends to monitor the ramp-rate success rate of the ramp-controlled PV output.

- 3) The excess energy production from the energy-shifted PV may be delivered to the GPA grid if advance notice is provided and accepted by the PSCC operators. Bidders may be allowed to dispatch excess energy to reduce the ramp-up rates of GPA's synchronous generators caused by the end-of-day duck curve.

CLARIFICATION: On 9/22/2023 (same date of Amendment X), we had a contact with several DC meter off-island manufacturers and requested specifications for our engineering review. However, we didn't get the specifications yet. As the meter is one of the important equipment for technical proposal, please allow the Bidders to have extension for technical bid submission.

ANSWER:

Kindly refer to **Amendment No.: XI** dated September 28, 2023.

Bidder No.: 10 dated 09/25/2023:

QUESTION:

1. Page 14 of 17:

"ANSWER: The award will be based on the lowest, responsive and responsible bidder. However, if all bids are above \$0.179 per kWh, GPA may consider accepting proposals above \$0.179 per kWh if the proposed interconnection facilities can be used for other projects."

Clarification 1.

Regarding, "if all bids are above \$0.179 per kWh", if several bids are above \$0.179 per kWh and remaining bids are NOT above \$0.179 per kWh, then GPA will NOT consider accepting proposals above \$0.179 per kWh even if the proposed interconnection facilities can be used for other projects.?

Clarification 2.

Regarding, "other projects," are other projects only for GPA Renewable Phase IV bid?

Clarification 3.

If yes, will GPA request reduction of Bidder's priced proposal if the proposed interconnection cost can be used for other renewable phase IV projects?

ANSWER:

- a. GPA will consider accepting proposals above \$0.179 per kWh if all bids are above \$0.179 per kWh.
- b. Yes.
- c. If the System Integration Study allows two projects to share a transmission line, GPA may request an interconnection cost-sharing agreement between the two Bidders. The criteria for cost-sharing shall be determined at a later time. However, GPA will only award on the base bid. If two Bidders can benefit from a shared interconnection, GPA may request each Bidder to reduce the total bid price for each party based on the interconnection savings.

QUESTION:

2. Page 15 of 17:

"ANSWER: The energy from the batteries must still be converted to AC by the PCS before it is delivered to GPA's grid. Therefore, the eventual path through a PCS is not eliminated by the requirement to DC-couple 50% of the resource to the energy storage system. The energy-shifted PV resource shall be DC-coupled to the ESS. The ESS shall then be connected to the PCS and then connected to the GPA grid. Only the ramp-controlled PV resource shall be connected to PV inverters and then connected to the GPA grid."

Clarification 4.

GPA's response does not require Rapid Response to over-frequency events via bi-directional PCS and Frequency Regulation for the future use will not be required any more. Please confirm.

Clarification 5.

But, why is GPA still requiring bi-directional PCS? May GPA allow one-directional inverter instead of PCS?

ANSWER:

- a. GPA still requires Rapid Reserve in response to under-frequency events and Fast Frequency Regulation.
- b. The bi-directional PCS is needed to provide some of the grid services listed on Page 103b of 263 of the bid document.

QUESTION:

3. Page 16 of 17.

"ANSWER: Two bids with a total export capacity of 30 MW (AC) from one project site is acceptable unless determined otherwise by the System Integration Study."

Clarification 6.

Previously, GPA responded "YES" to the Bidder's question that "Up to 60 MW (AC), at one or more sites, will a Bidder's proposal be considered as one (1) bid for \$150,000 bid bond?"

We are confused if the following one (1) bid for \$150,000 bid bond OR three (3) bids for \$450,000 bid bond?

- (1) 30 MW (AC) Project Site #1 to the Dededo 34.5kV substation with maximum 15MW POI
- (2) 30 MW (AC) Project Site #2 to the Dededo 34.5kV substation with maximum 15MW POI
- (3) 4.999MW (AC) Project Site #3 to the different POI @ 13.8kV near Dededo substation

ANSWER:

If several sites are submitted as one bid proposal, then a single \$150,000 applies. If submitted as separate bid proposals, then each submitted bid proposal requires \$150,000 bid bond each. Each proposal with multiple sites will be evaluated all together.

QUESTION:

4. We request for the submission period to be extended for an additional 6-8 weeks from the October 2, 2023 due date.

ANSWER:

Kindly refer to **Amendment No.: XI** dated September 28, 2023.

Bidder No.: 6 dated 09/26/2023:

QUESTION:

1. Bidder No.: 6 is hereby requesting additional 4 to 6 weeks extension for technical bid submission. Subject Amendment X triggered the Bidder to revise its BESS system configuration which requires 4 weeks of revision works by our off-island suppliers-manufacturers and 2 weeks review time by our international engineering consulting firm.

ANSWER:

Kindly refer to **Amendment No.: XI** dated September 28, 2023.

QUESTION:

2. [Clarification #1.](#)

GPA's ANSWER for reactive power requirement **as per GPA's Clarification #12**

The PCS and PV inverters must be capable of delivering power at 0.8 power factor at the Bidder's proposed system maximum real power.

For example, if a bid is for a 60 MW (AC) system, then the PCS and PV inverters shall each be able to deliver 30 MW (AC) at 0.8 power factor.

Please confirm the rated power requirements for PV Inverter and PCS.

For 5MW(AC), PCS is 2.5MW(AC) at 0.8PF and PV Inverter is 2.5MW(AC) at 0.8PF. PCS and PV Inverter scale up to 3.125MW(AC).

For 30MW(AC), PCS is 15MW(AC) at 0.8PF and PV Inverter is 15MW(AC) at 0.8PF. PCS and PV Inverter scale up to 18.75MW(AC).

For 60MW(AC), PCS is 30MW(AC) at 0.8PF and PV Inverter is 30MW(AC) at 0.8PF. PCS and PV Inverter scale up to 37.5MW(AC).

ANSWER:

For 5 MW (AC), PCS is 2.5 MW (AC) at 0.8 PF and PV Inverter is 2.5 MW (AC) at 0.8 PF. PCS and PV Inverter should be rated at 3.125 **MVA** (AC).

For 30 MW (AC), PCS is 15 MW (AC) at 0.8 PF and PV Inverter is 15 MW (AC) at 0.8 PF. PCS and PV Inverter should be rated at 18.75 **MVA** (AC).

For 60 MW (AC), PCS is 30 MW (AC) at 0.8 PF and PV Inverter is 30 MW (AC) at 0.8 PF. PCS and PV Inverter should be rated at 37.5 **MVA** (AC).

QUESTION:

3. [Clarification #2.](#)

Bidder's QUESTION:

2. Response question #8 to bidder #5 on page 50 of 63 of amendment IX states that "The capacity shall be guaranteed based on the beginning of the Commercial Operation Date (COD)." This is equivalent to a Beginning of Life design basis for the BESS capacity. Please confirm that the BESS 12-hr power rating (MW) shall remain constant throughout the 25-year lifespan of the project, requiring augmentation to maintain energy capacity to support the 12-hr discharge between 6 PM and 6 AM. Without augmentation, the BESS power (MW) rating will decrease as the BOL battery capacity degrades to maintain a 12-hr discharge and the percentage of the resource dispatched between 6 AM and 6 PM will increase.

GPA's ANSWER as [per Clarification #8:](#)

The capacity shall be guaranteed based on the beginning of the Commercial Operation Date (COD). The Bidder's guaranteed annual energy delivered to the GPA grid shall reflect degradation of the solar PV array and the battery energy storage system. The total export energy production degradation shall be limited to 0.7% annually. The total export capacity degradation shall also be limited to 0.7% annually.

Please confirm that GPA does NOT require specific minimum capacity requirement for the battery (MWh). The Bidders may install 15MW-60MWh (4 hours minimum) or 15MW-75MWh (5 hours) BESS for 30MW (AC) proposal if the Bidder's proposal meets GPA's energy / capacity requirements.

ANSWER:

GPA does not require a minimum energy capacity for the battery. However, the GPA Power System Control Center operators will try to dispatch all of the stored energy to the GPA grid subject to the power system demand.

QUESTION:

4. [Clarification #3.](#)

GPA's ANSWER to Question #4-1:

The energy from the batteries must still be converted to AC by the PCS before it is delivered to GPA's grid. Therefore, the eventual path through a PCS is not eliminated by the requirement to DC-couple 50% of the resource to the energy storage system. The energy-shifted PV resource shall be DC-coupled to the ESS. The ESS shall then be connected to the PCS and then connected to the GPA grid. Only the ramp-controlled PV resource shall be connected to PV inverters and then connected to the GPA grid.

The manufacturer of PV-BESS overall system has reviewed the system configuration that GPA provided on 9/22/2023. However, manufacturer's initial response is that this configuration may be used for the behind meter use-case, but this is NOT typical in the utility use-case. We are waiting for manufacturer's formal response and thus we may submit additional clarification this week.

ANSWER:

GPA has confirmed the utility-scale DC-coupled configuration with its consultant and is therefore upholding the requirement to DC-couple 50% of the resource to the energy storage system. However, Bidders shall be responsible for the design of the system.

Bidder No.: 10 dated 09/27/2023:

QUESTION:

1. Page 16 of 17:

"ANSWER: The energy from the batteries must still be converted to AC by the PCS before it is delivered to GPA's grid. Therefore, the eventual path through a PCS is not eliminated by the requirement to DC-couple 60% of the resource to the energy storage system. The energy-shifted PV resource shall be DC-coupled to the ESS. The ESS shall then be connected to the PCS and then connected to the GPA grid. Only the ramp-controlled PV resource shall be connected to PV inverters and then connected to the GPA grid."

Clarification:

After consulting with a global leading DC-coupled OEM, then confirmed that DC-coupled PV-BESS is unable to support Blackstart/Grid forming. Only AC-coupled PV-BESS can support Blackstart/grid forming. The reason is DC-coupled PV-BESS requires a charge controller to enable grid forming. But the charge controller for utility scale is unavailable. For this reason, we propose two options:

1. DC-coupled system PV-BESS without grid forming capability.
2. AC-coupled system PV-BESS with grid forming capability. The SC MVA contribution can be tuned as required.

Please advise.

ANSWER:

The PCS connected between the battery and the grid shall be grid-forming / black-start capable.

QUESTION:

2. We kindly request for the submission period to be extended for an additional 6-8 weeks from the October 2, 2023 due date.

ANSWER:

Kindly refer to ***Amendment No.: XI*** dated September 28, 2023.

Bidder No.: 1 dated 09/27/2023:

QUESTION:

1. **Clarification #1**

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ANSWER:

The energy from the batteries must still be converted to AC by the PCS before it is delivered to GPA's grid. Therefore, the eventual path through a PCS is not eliminated by the requirement to DC-couple 50% of the resource to the energy storage system. The energy-shifted PV resource shall be DC-coupled to the ESS. The ESS shall then be connected to the PCS and then connected to the GPA grid.

Only the ramp-controlled PV resource shall be connected to PV inverters and then connected to the GPA grid.

CLARIFICATION: Our pre-selected BESS manufacturer has 9GWh BESS contract globally. But they responded as below:

"For utility-scale PV-BESS DC-coupling, typical and proven configuration is PV to Battery and then to PV Inverter (not to the PCS). You may find other vendors who can propose PV-Battery-Hybrid Inverter (which has similar functionalities with PCS), but it is for the islanded residential PV-BESS project. PV-Battery-Hybrid Inverter configuration requires Charge Controller between PV and Battery. Maximum rating of this product is 6kW/48V only, which cannot be compatible to the 1kV range Battery for utility application. Required configuration may be technically feasible, but it is NOT commercially feasible.

Additionally, we don't have R&D plan to secure utility-scale Charge Controller and didn't hear that others have such plans."

The Bidders need GPA's clarifications on PV-BESS DC-coupling requirements to submit proven products that have at least one (1)-year of commercial operations history in a utility environment.

ANSWER:

GPA has confirmed the utility-scale DC-coupled configuration with its consultant and is therefore upholding the requirement to DC-couple 50% of the resource to the energy storage system. However, Bidders shall be responsible for the design of the system.

QUESTION:

2. **Clarification #2**

(Page 11 of 17)

ANSWER:

Two bids with a total export capacity of 30 MW (AC) from one project site is acceptable unless determined otherwise by the System Integration Study.

CLARIFICATION: For the previous Bidders question: "Up to 60 MW (AC), at one or more sites, will a Bidder's proposal be considered as one (1) bid for \$150,000 bid bond?", GPA responded "YES". Thus, we assume that GPA will allow the Bidder to provide \$150,000 bid bond for the following 4 project sites.

(1) 4.999MW (AC) Project Site #1 to the POI #1

(2) 4.999MW (AC) Project Site #2 to the POI #2

(3) 4.999MW (AC) Project Site #3 to the POI #3

(4) 4.999MW (AC) Project Site #4 to the POI #4

Please confirm if above is One (1) Bid for \$150,000 bid bond or Four (4) Bids \$600,000 bid bond?

ANSWER:

If several sites are submitted as one bid proposal, then a single \$150,000 applies. If submitted as separate bid proposals, then each submitted bid proposal requires \$150,000 bid bond each. Each proposal with multiple sites will be evaluated all together.

Bidder No.: 6 dated 09/28/2023:

QUESTION:

1. *"We are writing to address an important topic related to the charging of battery systems using photovoltaic (PV) power sources. It has come to our attention that some customers are considering using direct current (DC) chargers to feed PV-generated electricity directly into battery systems. We would like to emphasize that this practice is not recommended due to potential operational and safety concerns."*

"Our PV to battery systems are designed to work seamlessly with alternating current (AC) chargers. PV inverter + PCS are specifically engineered to provide controlled and stable charging, ensuring the efficient utilization of our battery storage while minimizing the risk of overcharging or other related issues. Attempting to use DC chargers for this purpose can lead to complications such as voltage mismatches and inadequate regulation, which may adversely affect the performance and lifespan of the battery system."

"Furthermore, it is important to note that in the current market landscape, DC chargers are primarily limited to small-scale applications and are not readily available in megawatt (MW) or larger capacities. MW-level DC chargers for PV to battery systems are still in development and are not yet widely accessible."

"We want to ensure that the PV and battery system operates at its highest efficiency and reliability, which is why we strongly recommend the use of compatible PV inverter + PCS for the setup. If you have any questions about charger compatibility, system optimization, or if you require assistance with the configuration of PV to battery system, please do not hesitate to reach out to us. We are here to assist you."

ANSWER:

GPA has confirmed the utility-scale DC-coupled configuration with its consultant and is therefore upholding the requirement to DC-couple 50% of the resource to the energy storage system. However, Bidders shall be responsible for the design of the system.

All other Terms and Conditions in the bid package shall remain unchanged and in full force.


for JOHN M. BENAVENTE, P.E.
General Manager 