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19-010/20-007

**IN THE OFFICE OF PUBLIC ACCOUNTABILITY**
**PROCUREMENT APPEAL**

| | |
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| **In the Appeal of** | **Docket No. OPA-PA-19-010**<br>**OPA-PA-20-001** |
| **GlidePath Marianas Operations, Inc.** | |
| **Appellant.** | **INTERESTED PARTY ENGIE SOLAR'S HEARING BRIEF** |

Interested Party and Winning Bidder ENGIE Solar ("ENGIE") hereby submits its Hearing Brief for the evidentiary hearing in this matter.

This appeal concerns Guam Power Authority Invitation for Bid GPA-IFB-007-18, Renewable Energy Resources Phase III (the "IFB"). Two procurement protests were filed by GlidePath Marianas Operations Inc. ("GlidePath") and appealed to the Office of Public Accountability ("OPA").

## I. ENGIE IS A GLOBAL LEADER IN RENEWABLE POWER SOLUTIONS

ENGIE—which traces its roots to the 19th century—is an international energy group and a global leader in low-carbon energy and services. It specializes in delivering renewable power solutions to cities, islands, and industrial users, with around $68 billion in revenues in 2019 and 26,900 MW of operating renewable energy plants worldwide (including 2,600 MW of solar

plants). ENGIE is present on all continents and employs over 160,000 people globally, with 6,000 employees in the United States.

ENGIE North America generates power from a mix of sources of which almost 100% are renewable or low carbon. It offers turnkey energy storage solutions and provides retail electricity and renewable supply in 14 U.S. markets. **ENGIE North America has over 1,700 MW of utility-scale and customer-sited solar photovoltaics ("PV") in operation, construction, and development and is the number one distributed energy storage company in the United States.**

**ENGIE partners with a number of cities, corporations, and municipalities around the world to make their renewable energy targets a reality**. For example, in Australia, ENGIE entered into an exclusive 50-year agreement with the emerging city of Springfield to make it a net-zero energy city. ENGIE will provide renewable energy generation and storage infrastructure, district energy schemes, green mobility solutions, digital technology, energy efficiency initiatives, and a dedicated research and innovation center. In New Caledonia, ENGIE (together with ENGIE EPS) is turning Lifou – the largest of the Loyalty Islands – into a 100% renewable island by 2030, with solar and battery storage and integrated green mobility solutions.

As part of the abovementioned strategy, ENGIE acquired SolaireDirect in 2015 - now ENGIE Solar - one of the first players to enter the solar PV business in 2010, and acquired in 2018 ENGIE EPS, number one globally in hybrid renewable and battery storage installations by number of projects. As a result of these acquisitions ENGIE designed and built:

- **130 solar parks worldwide in Europe, India, USA, Brazil, Mexico, etc. - the biggest of which has 1 million solar panels**
- **40 storage and storage + renewables projects worldwide**

ENGIE therefore has some of the most highly skilled teams anywhere in the solar and storage market. Due to its scale, ENGIE also has access to the most competitive equipment

prices. It is this unique combination of vertically integrated skills and scale in both solar and storage that enables ENGIE to deliver cleverly designed and competitive projects such as the one in Guam. ENGIE's design and engineering process involved technical teams from the U.S., France, India and Italy.

## II. RENEWABLE ENERGY RESOURCE PROCUREMENT PHASE III: A TRANSPARENT PROCESS AND CLEAR BID REQUIREMENTS

On June 3, 2019, after eighteen months of work, ENGIE submitted its technical proposal. In August 2019, GPA deemed ENGIE's proposal to be technically compliant–along with four other bidders – thus qualifying ENGIE to submit its price proposal.

The four other bidders qualified to submit a price proposal together with ENGIE were:

- AES: A Fortune 500 global power company and one of the world's largest Independent Power Producers;
- KEPCO & Hanwha consortium: The largest South Korean utility in partnership with a PV manufacturing company with over 9,000 MW of yearly solar cell production;
- X-Elio: A Spanish developer specialized in developing, designing, constructing and operating photovoltaic solar plants with over 650 MW of solar projects built;
- Glidepath: A US-based developer owned by Quinbrook Infrastructure Partners, which has experience mostly involving wind and energy storage project acquisition and development (445 MW of operating renewable energy projects).

As is standard for this type of a highly competitive renewable procurement process, GPA's Invitation for a Multi-Step Bid (the "IFB") requested that bidders deploy their technical competencies and capabilities to provide tailored solutions optimized for Guam's renewable energy targets, at the lowest possible cost to ratepayers.

The technical requirements are outlined in the pages 52-63 of the main IFB document and have been subsequently integrated in Amendment XIII, pages 160-166. All bidders were granted an opportunity to submit clarification requests to GPA, which were publicly answered in the various amendments issued before the technical proposal submission deadline.

## A. THE IFB CONTAINS THREE SPECIFIC REQUIREMENTS THAT GOVERN THE PROPOSED SYSTEM SIZE

### 1. Requirement #1: Limits Maximum Export Capacity at 30 MW (AC)

The IFB requires that: "[t]he Bidder's renewable resource project shall have a maximum export capacity 30 MW (AC) at the interconnection point; this may be the combination of several generation units at one site."[1]

This requirement means that the bidder's project must not provide more than 30 MW (megawatt) (AC) of electricity at the interconnection point. The interconnection point is the point on the existing GPA transmission grid where the new plant will be connected: this means that Requirement #1 does not represent a limitation on the size of the components of the PV and storage systems, but rather on the maximum output that can be injected into the grid during operation.

This requirement is typical for new multi-MW grid-connected renewable projects. This is because grid infrastructures (which includes transmission lines, generators, and other parts of the existing electrical grid) are usually unable to accommodate new power plants without putting grid operations at risk, unless major upgrades to the regional system are implemented. By limiting the interconnection point to a maximum export capacity of 30 MW (AC), this requirement limits the total impact of the new power plant on GPA's existing grid infrastructure.

### 2. Requirement #2: Links the Energy Storage System ("ESS") Charge Rate to the ESS Discharge Rate (ESS Discharge Rate Must be 145% of the ESS Charge Rate or Greater)

Electricity generated from renewable sources does not generally deliver a regular supply of power easily adjustable to consumption needs. This leads to network load stability problems. An Energy Storage System ("ESS") may be used to manage energy from renewable sources,

[1] Multi-StepBidGPA-007-18 – Main IFB document, page 52 – issued by GPA on November 24, 2017.

assisting in load stability and allowing energy to be stored and released into the grid during peak hours when consumption is higher. Amendment XIII to the IFB is directed at this issue and requires that "[t]he MW rating of the ESS shall be equal to or greater than the 145% of the MW rating of the PV charging system, up to a maximum capacity of 40 MW. For instance, for a PV installation of 27 MW, the ESS shall be rated at a minimum of 40 MW. For a PV capacity of 10 MW, the ESS rating shall be a minimum of 14.5 MW."[2] This requirement is a common one for this kind of PV+ESS project, in which utilities want to store the energy produced by a PV system during daytime and deliver it during peak consumption hours (which are typically the first 3-4 hours in the evening).

The rationale behind such a requirement can be easily understood when considering how the PV and storage system will operate once installed as per IFB requirements. The system put out to bid by GPA is meant to have the solar PV modules, together with the PV charging system, charge the ESS during daylight hours (around 12 hours per day in Guam throughout the year). The ESS is then discharged up to its maximum export capacity during evening peak hours, identified by GPA as a 4-6 hours period between 5pm and midnight.[3]

In order to accomplish this task, the MW rating of the PV charging system (meaning the rate at which the PV charging system charges the ESS – "ESS Charge Rate") has to be lower than the ESS's MW rating (meaning the rate at which the ESS discharges its stored energy – "ESS Discharge Rate"), thereby allowing for a slower charge (up to 12 hours) and a faster discharge (up to 4-6 hours).

Accordingly, Requirement #2 links the power rating of the PV charging system to the ESS's MW rating. More specifically, for a given ESS MW rating ($P_{ESS}$), the PV charging system MW rating cannot exceed $P_{ESS}/1.45$. In other words, the $P_{ESS}$ must be 145% or greater than the PV charging system MW rating.

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[2] Multi-StepBidGPA-007-18 – Amendment XIII, page 160 – issued by GPA on January 25, 2019.
[3] Multi-Step Bid GPA-007-18 – Amendment XVII, page 5 – Issued by GPA on April 18, 2019.

The rationale of this requirement was addressed by GPA in Amendment XVII to the IFB, in response to an ENGIE request for clarification:[4]

> Document Reference: Amendment XIII – P160/948: "The MW rating of the ESS shall be equal to or greater than the 145% of the MW rating of the PV charging system, up to a maximum capacity of 40 MW. For instance, for a PV installation of 27 MW, the ESS shall be rated at a minimum of 40 MW. For a PV capacity of 10 MW, the ESS rating shall be a minimum of 14.5 MW.
>
> Can we therefore assume the maximum PV charging system rating that can be installed is 27 MW?
>
> **GPA's answer:** This section of the amendment is to illustrate that the charging and discharging times of the ESS are different and design of the ESS should include consideration that the ESS would only have 4-6 hours to discharge at a maximum interconnection output of 30MW ac.

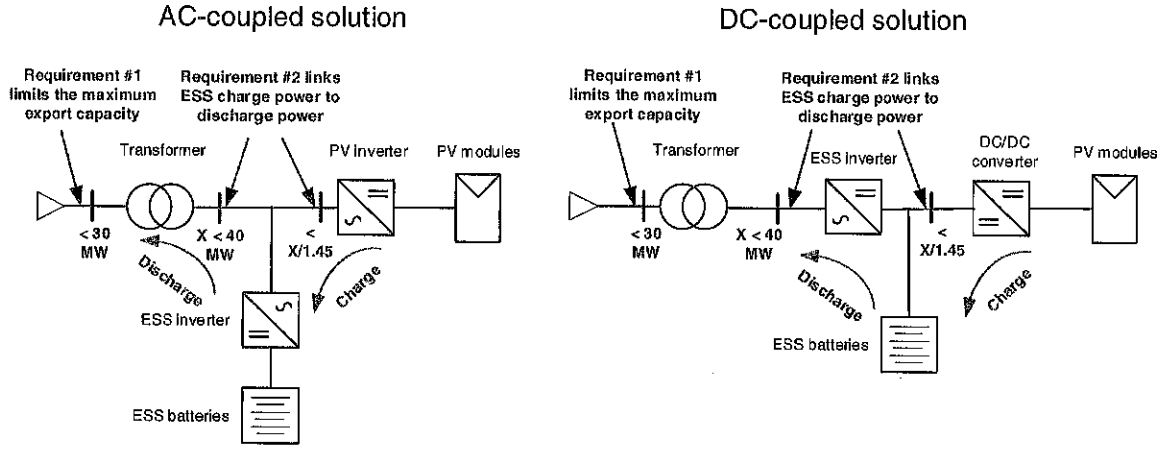
In its answer to ENGIE, GPA clearly states that this requirement is to ensure that the ESS charging and discharging rates are different.

How can compliance with Requirement #2 be achieved technically? This is a crucial question, as this requirement was misconstrued by GlidePath and their misinterpretation forms the basis of its appeal. In order to answer it, it is first important to understand how PV+ESS plants are meant to operate in general.

All PV+ESS plants can be categorized into two main designs:

a) **AC coupled systems**, where the Direct Current ("DC") electricity coming from the PV is converted to Alternating Current ("AC") through a PV inverter and then converted back to DC by the ESS inverter;
b) **DC coupled systems**, where a DC/DC converter is used instead of the PV inverter to convert PV DC electricity directly to DC electricity compatible with the ESS (avoiding the additional step of AC conversion and thus improving overall system efficiency).

[4] Multi-Step Bid GPA-007-18 – Amendment XVII, page 13 – Issued by GPA on April 18, 2019




Regardless of the design, it is the Power Conversion System ("PCS") of the PV system, either the PV inverter or DC/DC converter, that controls the power flow from the PV arrays to the ESS battery modules. **Consequently, the PV charging system MW rating is equal to the maximum power allowed by the inverter (in AC-coupled solutions) or the maximum power allowed by the DC/DC converter (for DC-coupled solutions).**

There is just one practical way to limit the power at the PCS output when designing a PV plant: to limit the size of the PCS itself, regardless of the amount of MWp installed. In fact, as explained above, **the power output of the PV charging system is physically capped at the maximum power allowed by the PCS, which acts as a bottleneck**.

It is therefore not surprising that all of the bidders but GlidePath chose to design the system this way and that GlidePath's tariff was the second highest on both sites.

GlidePath based its first appeal on the claim that Requirement #2 was a limitation on the total installed "Mega-Watt peak" capacity of the PV modules, rather than on the PCS capacity, whereas GPA itself had already clarified the issue in Amendment XVII.

Glidepath and Pacific Energy Corporation both asked specific questions to determine whether the PV system requirements were referring to MW DC (otherwise known as MWp) or MW AC. Both times, GPA unequivocally answered "AC". See below Pacific Energy inquiry:

> What is the reasoning that the MW rating of the ESS is equal to or greater than the 145% of the MW rating of the PV charging system? Is it for Daytime grid support? Or is it for Night time discharge? Or is there another reason?
>
> The wording "MW" rating, is that in relation to PV AC (Inverter) or PV DC (Module)?
>
> **GPA's answer:** "GPA anticipates all production to be delivered within a 4-6 hour window. This would require an ESS discharge rate higher than its charge rate from the PV.
>
> Rating is AC reference. [5]

To the explicit question ("The wording "MW" rating, is that in relation to PV AC (Inverter) or PV DC (Module)?"), GPA unequivocally replied that the requirement is to be applied to the PV inverter ("Rating is AC reference.") and **NOT to the module power (MWp)**.

In the IFB documents (including all the amendments), GPA only refers to the PV charging system and never mentions PV modules MWp capacity. Furthermore, in the reported portions of the Amendment XVII (a public document available to all bidders), GPA ties the PV charging system MW rating to the Power Conversion System MW rating, explicitly disproving GlidePath's interpretation of a PV charging system MW rating having any connection with the PV modules MWp rating.

### 3. Requirement #3: PV Capacity Must Be Maximized

Amendment XIII to the IFB requires that "The MW output of PV used to charge the ESS should be maximized to the amount of capacity available on each site and any energy restrictions of the ESS."[6]

This requirement is typical for solar PV bid where the bidding authority provides specific sites for the solar PV plant construction. Having set maximum export capacity restrictions, the bidding authorities then normally leave it to the bidders to maximize the solar production with their proposed design, within the physical site constraints. It is also standard to

[5] Multi-Step Bid GPA-007-18 – Amendment XVII, page 16 – Issued by GPA on April 18, 2019.
[6] Multi-StepBidGPA-007-18 – Amendment XIII, page 160 – issued by GPA on January 25, 2019

refer to any restrictions of energy of the ESS, since all the energy to be delivered to GPA must first be stored in the ESS.

It is in the interest of GPA and of any other power authorities, when running a competitive bid process, to not impose any limits on the MWp - up to any limits imposed by space availability on site - as it would damage proposal competitiveness and leave no room whatsoever for system optimization to be proposed by participating bidders. The MWp is in fact one of the most important variables that has to be optimized on the basis of specific design choices of each bidder.

## III. ENGIE'S PROPOSAL IS FULLY COMPLIANT WITH THE IFB

ENGIE's proposed PV+ESS plant is fully compliant with all of the specifications included in the IFB. ENGIE's engineering team designed a highly optimized solution with the following characteristics:

- Maximum export capacity: **30 MW**;
- ESS capacity (@ESS inverter): **30 MW (rated) / 36 MVA (nameplate);**
- PV DC/DC converter capacity: **20.7 MW (rated) / 24 MW (nameplate);**
- PV peak power installed (@modules, **not limited in any way by IFB**): **27.64 MWp (Naval Base) / 26.47 MWp (S. Finegayan)**.

### 1. Requirement #1: ENGIE's Proposal Meets Requirement #1 By Limiting Maximum Export Capacity

ENGIE's proposed PV+ESS plant meets the first requirement, because the maximum export capacity of the plant is 30 MW.

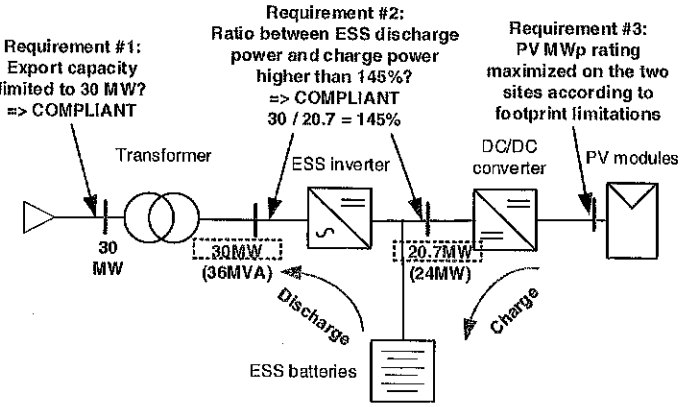
As reported in the Qualitative Scoring Workbook submitted with the proposal, the Contract Net Capacity of the project has been set at exactly 30 MW.

The compliance to this requirement is also explicitly shown in the sample facility production profiles included in *Section B-1: Operating profile* of ENGIE's proposal which are generated by the same model used by the team to compute the Guaranteed Net Annual

Generation and the tariff. The submitted charts highlight a power discharged into the grid by the system always equal or below 30 MW for both sites[7].

### 2. Requirement #2: ENGIE's Proposal Meets Requirement #2 By Linking the ESS Charge Rate to the ESS Discharge Rate at the Required Percentage (145%)

By limiting the power rating of the DC/DC converter to 20.7MW, ENGIE ensures compliance with Requirement #2, reducing the charge rate to 20.7MW regardless of the installed peak power at PV module level. A detailed description of how this is achieved is included in ENGIE's technical offer[8] and is summarized in the diagram below.




### 3. Requirement #3: ENGIE's Proposal Meets Requirement #3 By Maximizing PV Capacity

ENGIE's engineering team spent several months throughout bid preparation studying the sites. Following a lengthy iterative optimization process involving the PV and ESS engineering teams together with the system modelling group, a solution with an east-west PV module configuration was chosen to maximize PV production: the module arrays face east or west, rather than all facing south as most plants north of the equator do.

This configuration, combined with the selection of top tier, high efficiency modules, enables ENGIE to fully exploit the available space on each site and install more MWp than all other bidders.

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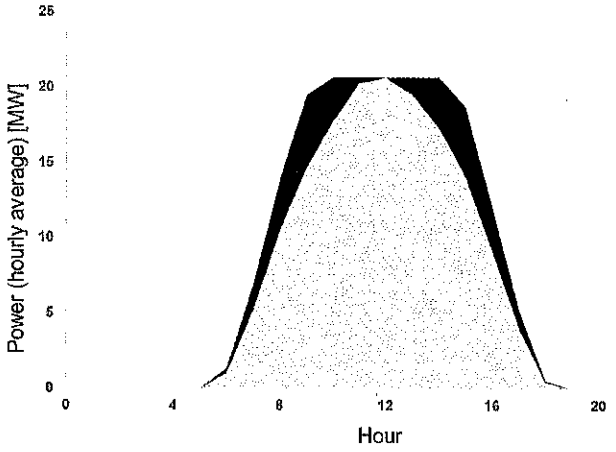
[7] Procurement act record, page 2162-2163 / 2398-2399 (Binder 3)
[8] Procurement act record, page 2162-2163 / 2398-2399 (Binder 3)




Due to the maximization of the MWp installed on site, ENGIE's proposed solution will produce more energy and at a better price compared to a solution with only 20.7 MWp of PV modules installed, as illustrated in the chart above: maximizing PV module capacity allows to capture a significant amount of additional solar energy (the green part in the graph above) throughout the day compared to a 20.7 MWp installation (the yellow part in the graph above). Most importantly, this PV production is generated without exceeding the 20.7 MW limit on the ESS charge rate from the PV imposed by Requirement #2, thanks to the limitation imposed at the DC/DC converter. For the avoidance of doubt, the example above with modules installed with precisely 20.7MWp of capacity is only given to illustrate GlidePath's erroneous claim and misinterpretation. The IFB contains no reference whatsoever to a 20.7MWp capacity for PV modules: there would have been no reason for ENGIE to consider this specific capacity size for PV modules in its bid preparation. On the contrary, ENGIE proposal is compliant with Requirement #3 by installing the maximum amount of PV modules capacity within the physical constraints of the sites.

## IV. GLIDEPATH MISCONSTRUED REQUIREMENT #2, BELIEVING IT TO BE A LIMIT ON THE PV PEAK POWER AT MODULE LEVEL

Glidepath's entire appeal rests on their claim that Requirement #2 effectively limits the installable peak power of the PV module (DC) to 20.7 MWp (30 MW/1.45). GlidePath's

interpretation of this requirement is patently wrong, especially given statements made by GPA on the issue in response to questions by the bidders.

GPA's statements included in the Amendment XVII clearly show that the alleged limit on the PV peak power at the module level, the sole argument in GlidePath's appeal and attempt to deem ENGIE's proposal non-compliant, does not exist. GlidePath either did not understand the requirement or simply considered it and, due to the lack of experience in designing PV systems, opted for a sub-optimal PV system sizing.

Regardless of the actual basis for GlidePath's misinterpretation of this sizing requirement, GlidePath's claim they were misled regarding the sizing requirements is factually false. GlidePath itself sought clarification on this precise issue and received an unequivocal reply from GPA:

> *"Question #2.13: §2.3.1 "Please confirm the nameplate capacities referred to in the IFB are measured in megawatts (MW) AC and not DC.* ***For example, a solar plant with a nameplate capacity of 30 MW as measured on the AC side of the inverters would be an eligible project even if it had more than 30 MW of generation capacity on the DC side of the inverters****" (emphasis added).*
>
> *ANSWER:* ***Yes, capacities are in megawatts AC."*** [9]

**The fact that GlidePath, after receiving explicit clarifications from GPA, chose to disregard such explicit clarification about the IFB instructions, does not entitle them to claim they were not clear in the first place.** Furthermore, in Amendment XIII, (the amendment that outlines Requirement #2) GPA required the bidders to maximize the PV output (Requirement #3), thereby contradicting GlidePath's erroneous interpretation of the requirement [10].

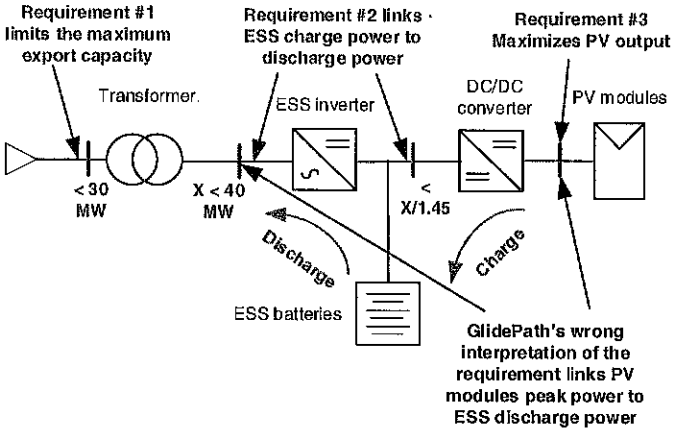
Lastly, **there is not a single mention or reference to the installable peak power of the PV module (DC) anywhere in the IFB or its amendments.** The reason there was no

[9] Multi-StepBidGPA-007-18 – Amendment XIII, page 36 – issued by GPA on January 25, 2019
[10] Multi-StepBidGPA-007-18 – Amendment XIII, page 160 – issued by GPA on January 25, 2019

restriction of the installable peak power of the PV module (DC) is because it is up to the bidder to determine how many PV modules to install to optimize its individual production modeling. The oversizing of PV modules capacity (PV DC capacity) is a common practice when designing PV plants to reduce electricity costs, as reported, among many other sources, by the US Energy Information Administration website[11]:

> Developers of solar PV facilities intentionally over-build the DC capacity of their system relative to the AC output for a few reasons. The output of a solar PV system is dependent on the availability of the sun. Because the output of panels may only reach peak DC capacity a few hours out of the year, it may not be cost effective to size an AC inverter to capture that full output. PV panels' output not only changes over the course of the year, when the sun is at different altitudes in the sky, but output also declines as solar PV cell/module performance degrades over time.

The below scheme shows GlidePath's misconstrued requirement (in red), in comparison to GPA's requirements clearly explained in the IFB (in green):




PV modules can only produce DC electric current; thus there simply is no way to link an AC MW rating to the amount of PV modules, or in other words to what GlidePath refers to as Mega-Watt peak capacity (MWp).

**Contrary to what has been stated by GlidePath, all the other bidders** understood this requirement and proposed PV systems above the alleged cap of 20.7 MWp:

[11] https://www.eia.gov/todayinenergy/detail.php?id=35372 – archived article dated March 16, 2018 – "Solar plants typically install more panel capacity relative to their inverter capacity"

- **AES** proposal for S. Finegayan site: **23.58 MWp**[12];
- **KEPCO/Hanwha** proposal for both S. Finegayan and Naval Base site: **21 MWp**[13];
- **X-Elio** proposal for Naval Base site: **24.98 MWp**[14];
- **ENGIE** proposal for S. Finegayan site: **26.47 MWp** / Naval Base site: **27.6 MWp**[15]

It is worth noting that while ENGIE, AES, KEPCO/Hanwha and X-Elio are all global renewable energy players with GWs of PV designed and installed, Glidepath has one single reference[16] for a solar Photo-Voltaic ("PV") system – the Dandan solar project in Guam – that it acquired, post-construction, at the beginning of 2019. GlidePath therefore has no solar PV ***plant design*** experience.[17]

GlidePath's lack of experience and lack of engineering expertise in the design of PV systems were demonstrated in their request[18], dated August 22nd, 2019, for access to the technical offers of all the other bidders under the Guam Sunshine Act. In a subsequent Appeal, GlidePath stated the purpose of its request was due to the price gap between ENGIE's and the other bidders' offers. However, price proposals had not yet been submitted to GPA at the time their Sunshine Act request was lodged: there was therefore no way for GlidePath to know the prices offered by the other bidders, or the relative gaps between them.

## V. ENGIE'S PROPOSAL GUARANTEES HIGHEST SAVINGS TO GPA AND GUAM RATEPAYERS

ENGIE has spared no effort to design the optimal system for GPA and Guam ratepayers to support their goals of ensuring clean, reliable and cheaper electricity to the island. As a result, ENGIE was able to offer in its price proposal, submitted on September 10, 2019, tariffs for two

[12] Procurement act record, page 1574 (Binder 2)
[13] Procurement act record, page 3300 (Binder 4)
[14] Procurement act record, page 5144 (Binder 6)
[15] Procurement act record, pages 2086 and 2323 (Binder 3)
[16] Procurement record, page 4131 (Binder 5)
[17] https://glidepath.net/glidepath-acquires-25mw-solar-project/
[18] Procurement Appeal on Denial of Procurement Process in the Office of Public Accountability, page 4 – submitted by GlidePath Marianas Operation Inc. on January 21, 2020.

sites which were substantially lower than GlidePath's (or any other bidder's): **$108.9/MWh and 110.9/MWh** on S. Finegayan and Naval Base.

The second lowest bidder – AES - offered $152.9/MWh and 161.2/MWh (around 30% higher than ENGIE's), while GlidePath's "alternate" offer was as high as $176.00/MWh for both sites (approximately 40% higher than ENGIE's).

## VI. CONCLUSION

The sizing requirements included in the IFB and its amendments were clear and common to this type of bid. GPA further clarified the rationale behind Requirement #2 as well as precisely indicated where to apply it in Amendment XVII for the benefit of all the bidders.

**All technically qualified bidders but GlidePath** understood the technical requirements included in the IFB and its amendments and proposed PV systems larger than the alleged 20.7MWp cap. This shows that, contrary to GlidePath's claim, no other bidder was "led astray" by the IFB requirements. **GlidePath alone misinterpreted GPA's clearly delineated requirements on system size.**

ENGIE's proposal is not only fully compliant with the technical requirements of the IFB, it also ensures a **30% lower tariff for GPA and Guam's ratepayers with around 300,000MWh more renewable energy over the 20-year contract**, compared to the proposal of the second lowest bidder, AES.

For all of the foregoing reasons, the appeal of GlidePath Marianas Operations Inc. should be dismissed.

**DATED** this 5th day of June, 2020.

**BLAIR STERLING JOHNSON & MARTINEZ**
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BY: _____
**R. MARSIL JOHNSON**
*Attorneys for Party in Interest ENGIE Solar*

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