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8 **BEFORE THE GUAM PUBLIC UTILITIES COMMISSION**

9 **IN THE MATTER OF:**) **GPA DOCKET NO. 20-09**
10 The Petition of the Guam Power Authority for) **PETITION FOR CREATION OF NEW**
11 Creation of new Energy Storage Rate) **ENERGY STORAGE RATE**
12 Schedule.)
13 _____)

14 **COMES NOW**, the GUAM POWER AUTHORITY (GPA), by and through its counsel
15 of record, D. GRAHAM BOTHA, ESQ., and hereby files GPA's Petition for the Public Utilities
16 Commission of Guam to review and approve GPA's recommendation to create a new Energy
17 Storage Rate Schedule, which a new Net Energy Metering (NEM) customer may elect to pay
18 instead of using Frequency Control Capability or an Energy Storage System (ESS) with the
19 installation of a new solar PV or wind turbine system, as follows:

20 **BACKGROUND**

21 The current Guam Power Authority net metering policy was established in December
22 2008 under GPA Docket 08-10. The Joint Renewable Integration Study (JRIS) conducted with
23 the Navy in July 2018 has determined that new PV installations should have Frequency Control
24 Capability or Energy Storage System (ESS). The CCU has approved GPA's recommendation
25 that all NEM customers must have Frequency Control Capability or Energy Storage System
26 (ESS) after June 1, 2020. GPA is petitioning the PUC to create an Energy Storage Rate
27 Schedule, so that a new NEM customer may select the new Rate Schedule in lieu of providing
28 ESS or Frequency Control Capability with a new solar PV installation. GPA recommends that
the initial Energy Storage Rate Schedule be set at \$2.43 per kW per month, as installed.

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DISCUSSION

GPA hereby petitions the PUC, pursuant to the Contract Review Protocol for the Guam Power Authority, to review and approve GPA's recommendation to create a new Energy Storage Rate Schedule, which a new Net Energy Metering (NEM) customer may elect to pay instead of using Frequency Control Capability or an Energy Storage System (ESS) with the installation of a new solar PV or wind turbine system. In support of this Petition, GPA hereby provides the PUC with Consolidated Commission on Utilities (CCU) Resolution No. 2020-01, which authorizes the General Manager to submit the petition the PUC for final review and approval of a new Energy Storage Rate Schedule. Said resolution and its exhibits are attached herein as Exhibit A, and incorporated by reference herein as if fully set forth.

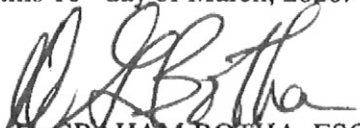
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CONCLUSION

The PUC should approve the to create a new Energy Storage Rate Schedule, which a new Net Energy Metering (NEM) customer may elect to pay instead of using Frequency Control Capability or an Energy Storage System (ESS) with the installation of a new solar PV or wind turbine, as it is reasonable, prudent, and necessary, and results in the improvement of the grid for all customers.

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RESPECTFULLY SUBMITTED this 10th day of March, 2020.


D. GRAHAM BOTHA, ESQ.
GPA General Counsel



CONSOLIDATED COMMISSION ON UTILITIES
Guam Power Authority | Guam Waterworks Authority
P.O. Box 2977 Hagatna, Guam 96932 | (671)649-3002 | guamccu.org

RESOLUTION NO. 2020-01

AUTHORIZING MANAGEMENT TO REQUIRE ALL FUTURE UTILITY-SCALE AND NET ENERGY METERING SOLAR PHOTOVOLTAIC (PV) AND WIND TURBINE SYSTEMS TO HAVE FREQUENCY CONTROL CAPABILITY OR ENERGY STORAGE SYSTEM (ESS) IN ORDER TO BE TIED INTO ISLAND POWER GRID

WHEREAS, Guam Public Law 27-132 (December 2004) created Net Energy Metering (NEM) for Guam and assigned the Guam Public Utilities Commission (PUC) the responsibility for setting the Net Metering Rate for excess renewable energy fed into GPA's Distribution System; and

WHEREAS, NEM customers receive services from the grid subsidized by non-NEM customers including but not limited to:

- 1) Use of the grid to sell power (get credit at full retail rate for excess production);
- 2) Use of the grid to energize their homes at night, but credited back from their production (uses Island power grid as storage);
- 3) Frequency regulation absorbed by grid for intermittencies;
- 4) Reactive power supply;
- 5) Voltage regulation;
- 6) Stand-by power on overcast days that cannot produce sufficient power generation; and

WHEREAS, on February 9, 2020, GPA conducted a stakeholder outreach meeting concerning this proposed Resolution; and

WHEREAS, Exhibit A illustrates the intermittency of solar photovoltaic (PV) production and highlights that an Energy Storage System (ESS), such as a battery, or Frequency Control Capability is necessary to provide smooth energy into the customer premise or power grid; and

WHEREAS, a 25 MW utility-scale solar PV farm and an estimated 24 MW of net metering capacity are currently tied into the grid without ESS or Frequency Control Capability, resulting in significant intermittency which degrades the reliability of the island wide power system; and

WHEREAS, production graphs of the utility-scale Dandan solar PV farm (Exhibit B) during several consecutive weeks of rainy weather, aptly illustrates that solar PV production is inconsistent and requires substantial battery storage reserves; and

WHEREAS, Exhibit C illustrates the number of automatic under-frequency load shedding events have increased substantially over the past few years due to intermittency of solar PV systems tied into the island's power grid. As of October 31, 2019, GPA customers experienced 27 feeder trips or outages due to solar PV systems without ESS or Frequency Control Capabilities. Although the pending utility-scale 40 MW ESS will

control system frequencies and decrease these outages, the addition of more intermittent energy into the grid will continue to degrade system reliability; and

WHEREAS, the customers paying for the system grid are non-NEM customers who have been experiencing substantial outages due to solar PV intermittency; and

WHEREAS, GPA completed its Joint Renewable Integration Study (JRIS) with the United States Navy in July 2018, and made the following observations: (1) all PV added with and after Phase II Renewables project require additional ESS support during transient events; (2) all PV added with and after Phase II Renewables project require additional Short-Circuit Ratio (SCR) support supplied by GPA; (3) all ESS should have frequency droop control modes available; and (4) the PV systems and the energy storage should share the same DC bus configuration behind one inverter system to reduce the SCR burden on GPA and reduce the PV ramping effects due to intermittent solar irradiation; and

WHEREAS, JRIS recommends current and future projects, including the new flexible generation power plant, help ameliorate the above effects; and

WHEREAS, GPA cannot continue to add intermittent energy production into the grid without requiring all future customer owned solar PV and wind turbine systems to have Frequency Control Capability or Energy Storage System (ESS). Thus, GPA recommends that all new NEM customers must have Frequency Control Capability or Energy Storage System (ESS) after **June 01, 2020**.

WHEREAS, GPA could provide Energy Storage System (ESS) into the grid at low cost due to its opportunities through economies of scale.

WHEREAS, GPA will petition the PUC to create an Energy Storage Rate Schedule, a new NEM customer may select the new Rate Schedule in lieu of providing ESS or Frequency Control Capability. GPA recommends the initial Energy Storage Rate Schedule be set at \$2.43 per kW per month, as installed.

WHEREAS, these moves will actually continue to promote the development of renewable energy on Guam and gives choices and flexibility to the individual in a way that is in their best economical interest.

NOW, THEREFORE, BE IT RESOLVED, by the CONSOLIDATED COMMISSION ON UTILITIES as follows:

1. The General Manager has determined that the number of automatic under-frequency load shedding due to solar PV systems has increased substantially over the past few years and uncontrolled solar PV energy has significantly degraded system reliability. Those whose reliability is impacted substantially are the non-NEM customers, which expect to have improved reliability when the 40 MW Energy Storage System (ESS) is completed.
2. GPA's existing policy is to have all future utility-scale solar PV or wind turbine systems, beginning with GPA's Phase II Renewables projects, be equipped with ESS in order to improve reliability.
3. GPA cannot continue to add intermittent energy production into the grid without requiring all future customer owned solar PV and wind turbine systems to also have frequency control capability or ESS.

73 4. After June 01, 2020, all new utility-scale, and NEM solar PV and wind turbine systems must have
74 Frequency Control Capability or ESS in order to be tied in to island power grid.
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76 5. GPA is authorized to petition the PUC to create an Energy Storage Rate Schedule, a new NEM
77 customer may select the new Rate Schedule in lieu of providing ESS or Frequency Control
78 Capability. GPA recommends the initial Energy Storage Rate Schedule be set at \$2.43 per kW
79 per month, as installed.
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81 **RESOLVED**, that the Chairman of the Commission certifies and the Secretary of the Commission attests
82 the adoption of this Resolution.
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84 **DULY and REGULARY ADOPTED and APPROVED THIS 21st DAY OF FEBRUARY, 2020.**
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86 Certified by:

Attested by:

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90 JOSEPH T. DUENAS

91 Chairperson

92 Consolidated Commission on Utilities
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90 MICHAEL T. LIMTIACO

91 Secretary

92 Consolidated Commission on Utilities
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94 I, Michael T. Limtiaco, Secretary for the Consolidated Commission on Utilities (CCU), as evidenced by my
95 signature above do certify as follows:

96 The foregoing is a full, true, and accurate copy of the resolution duly adopted at a regular meeting of the
97 members of Guam Consolidated Commission on Utilities, duly and legally held at a place properly noticed and
98 advertised at which meeting a quorum was present and the members who were present voted as follows:
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100 Ayes:

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101 Nays:

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102 Absent:

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103 Abstain:

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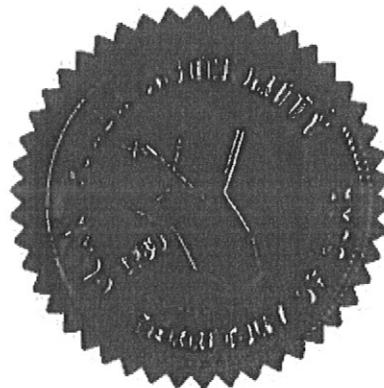
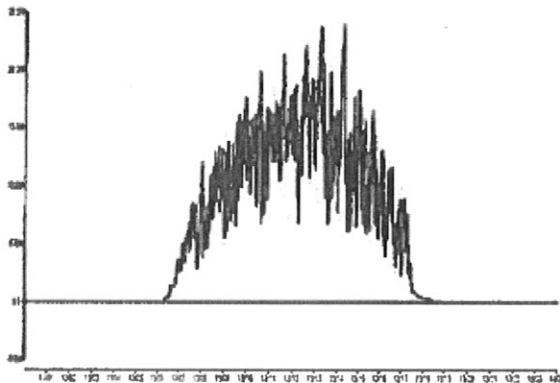


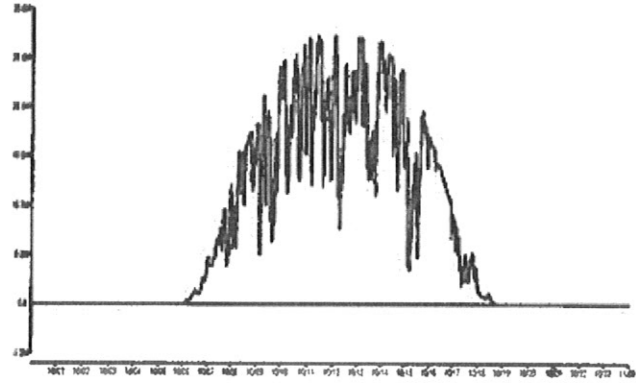
Exhibit A

NEM (SOLAR PV) CUSTOMER PROFILE INTERMITTENCY

Peak Output
26.5 MW



Peak Output
23 MW



Residential NEM Solar PV System Size = 24.70 kW

TIME OF DAY	kWh	
	GPA → NEM	GPA ← NEM
0000 – 0700	22.56	-
0700 – 1800	7.44	69.35
1800 – 0000 (Evening Peak)	24.67	
Net GPA	-14.68	

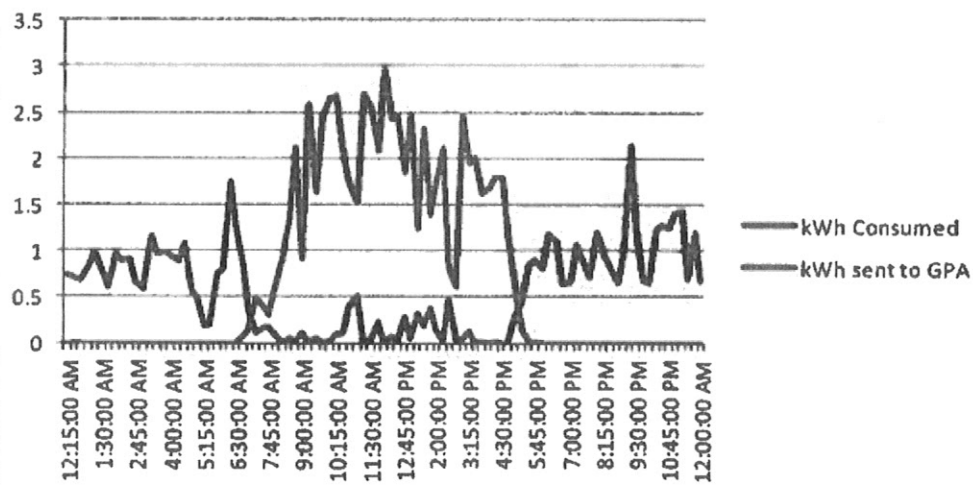


Exhibit B

Solar PV Production is Inconsistent and Requires Substantial Battery Reserves

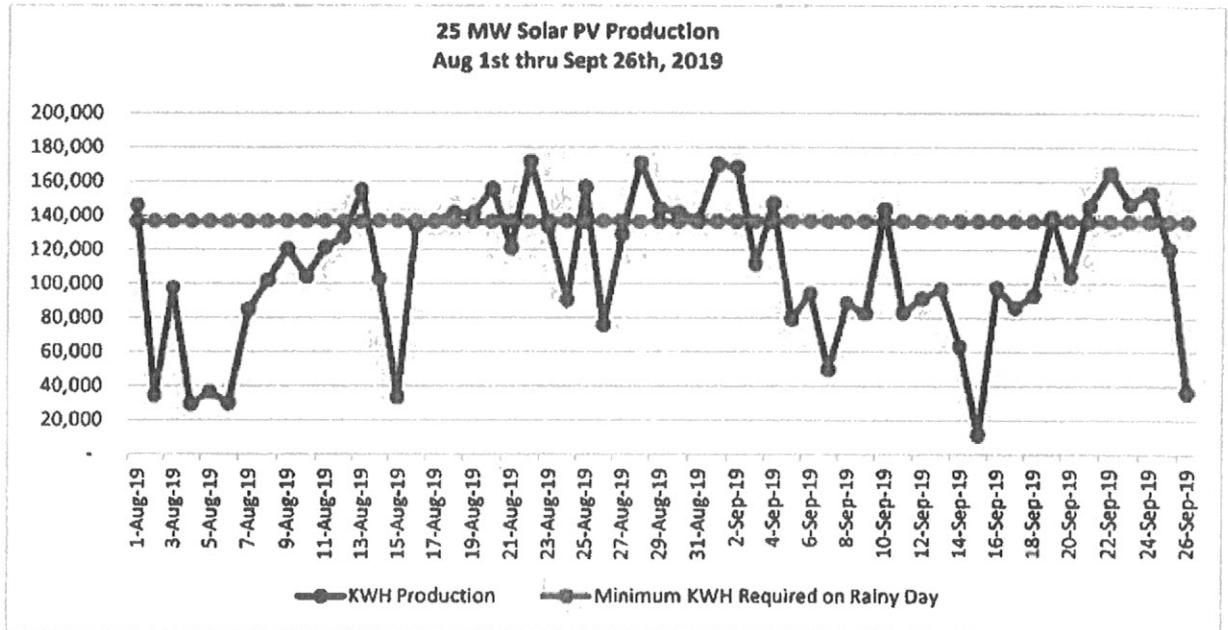


Exhibit C

