GUAM POWER AUTHORITY

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FC 2023-0009
3/7/2023
QG

February 22, 2023

Mrs. Lola E. Leon Guerrero
Director
Bureau of Statistics and Plans (BSP)
P.O. Box 2950
Hagåtña, GU 96932

Subject: Federal Consistency Review for Ordot Chalan Pago Elementary School – LED Lighting Upgrades & Solar PV Renewable Energy Generation Project under DOI's Energizing Insular Communities FY2022 Funding Opportunity
OIA GRANT (GR) NUMBER: D22AP00319

Mrs. Leon Guerrero,

Hafa Adai! In collaboration with the Guam Department of Education (GDOE) and funding assistance from the Department of Interior (DOI), GPA will be embarking on LED lighting retrofits and Solar PV as Facility Improvement Measures at Ordot Chalan Pago Elementary School. These activities fall under our Bringing Energy Solutions To (BEST) Schools Program.

The proposed project includes administrative work, information research such as profiling energy loads and performing energy audits, procurement and mobilization of equipment, installation of materials, and proper disposal of replaced lighting equipment through an EPA-certified lighting vendor with the proper licensing and certifications for disposal of lighting equipment.

Attached is a brief summary of scope of work approved by the Department of Interior as well as details of our project site. The Authority humbly requests for BSP's assistance for reviewing the tasks under the project scope and providing comments regarding compliance to development and resource policies of the Guam Coastal Management Program (GCMP).

GPA hopes to commence construction activities after the U.S. Department of Interior gives their Authorization to Proceed (ATP), which is conditionally given after Federal Consistency Reviews have been completed through various Guam agencies like BSP under a Record of Environmental Consideration. We greatly appreciate your support to assist GDOE in their energy conservation.

Sincerely,

for John M. Benavente, P.E.
General Manager

Attachment(s)

RECEIVED
MAR 03 2023
HP 3:20pm
BUREAU OF
STATISTICS AND PLANS

Enhancing Reduction in
Dependence on Off-island Fuel *and*
Cost of Electricity Project

BEST Schools Program

Ordot Chalan Pago Elementary School LED Lighting Upgrades & Solar PV Renewable Energy Generation: Energy Conservation Project

A Grant Proposal submitted by the

Guam Power Authority

To the US Department of the Interior
OFFICE OF INSULAR AFFAIRS

FY2022 Energizing Insular Communities Program (EIC)

June 2022

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1.0 Introduction

The Guam Power Authority is a public corporation and autonomous instrumentality of the Government of Guam. Since 1968, GPA has evolved from a mere energy service provider into an energy solutions company. During the past few years, GPA had been a proud energy services company for its accomplishments: It has lowered power bills twice; opened a one-stop customer service center; instituted cash rebates for purchasing energy efficient appliances; replaced inefficient streetlight bulbs with LED throughout the island and upgraded security for online bill pay. Internally, GPA has initiated certain cost cutting efforts including the opening of an energy-efficient utilities facility center for its employees and using fewer 24-hour vehicles. With these service accomplishments, GPA has also been focusing its attention on finding ways to enhance its mission to provide reliable and affordable electrical power.

The Guam Energy Task Force (GETF) was established by Executive Order 2010-15 on May 10, 2010, by the Governor of Guam, as a non-regulatory advisory group sponsored by the Government of Guam under the direction of the U.S. Department of the Interior Office of Insular Affairs and the National Renewable Energy Laboratory (NREL). One of GETF's primary missions is to reduce the island's dependence and expenditures on imported fossil fuels. Under the sponsorship of the Department of Interior and the Guam Energy Office (GEO), the GETF developed, reviewed, and finalized Guam's Strategic Energy Plan *(see Appendix A, Page 12)*, which presents various strategies that are available to Guam in pursuit of diversifying fuel sources and reducing fossil energy consumption 20% by 2020 (20x20 Goal).

Guided by the Guam Energy Strategic Plan and the current territorial Renewable Portfolio standard, GPA has been aggressive in evaluating ways to enhance reduction in its heavy dependence on fossil fuel and in seeking alternative sources of energy for the reduction of cost of energy production (electricity).

2.0 Project Narrative

This grant application proposes the implementation of an LED lighting retrofit and Solar PV Renewable Energy Generation at Ordot Chalan Pago Elementary School in the village of Ordot Chalan Pago, Guam. This elementary school hosts over 490 student enrollees and over 60 staff members annually. It is a medium-sized elementary school with a total building area of 50,599 square feet. The conversion of conventional lighting to LED technology and the installation of solar PV will produce significant energy consumption savings all while modernizing the school's infrastructure. This project falls under GPA's BEST Schools Program. All efforts under this proposed projects is one example of how GPA continues to provide Guam communities energy solutions beyond the normal utility's duty to generate, transmit, and distribute power to its customers.

2.1 BEST Schools Program

The Bringing Energy Savings To (BEST) Schools is a program of GPA. It resulted from close collaborative work between the Guam Power Authority and the Guam Department of Education.

Under its Utility Energy Services Contracts, Ordot Chalan Pago Elementary School was identified as one of the top Guam public schools that will benefit from LED retrofit and solar PV installation.

GPA's commitment and intention for the proposed project, to assist the Guam Department of Education, to save on energy consumption is evident by its completed feasibility assessment of all public schools at the expense of GPA *(See Appendix F: Preliminary Feasibility Assessment of GDOE Schools – 11.18).*

The degree to which the BEST Schools program is identified and supported in the Territory's Strategic Energy Plan and/or Energy Action Plan is evidenced by GPA Docket 18-11 *(See Appendix C)* approved by the Guam Public Utilities Commission (PUC). The commission ordered $500,000 for implementation of the BEST School programs *(See P2, item no. 6)*, sourced through Bond Savings Refunding.

The Guam Education Board adopted Resolution No. 2022-02 whereby its budget allocated the total amount of $14,190,242 for electricity *(See attached Appendix D)*. With BEST Schools program, GPA stands ready to guide GDOE to opt for efficient systems to procure. This will support the efforts of GDOE in cost-cutting initiatives.

2.2 Project Description

FIM: LED Lighting Upgrade

Ordot Chalan Pago Elementary School has mainly T-8 linear fluorescent lighting fixtures throughout in their classrooms and offices. Newer technologies such as Light-emitting diode (LED) bar kits have been developed as replacements for linear fluorescent lamps that are significantly more efficient than conventional fluorescent systems. Unlike linear fluorescent lamps, which emit light in an omnidirectional pattern, LED replacements are directional sources intended to emit light directly out of the fixture (e.g., downward in the case of a troffer). A retrofit of older fluorescent lamps will improve current lighting levels while saving substantial energy.

The additional benefit of LED lights is they emit less heat (reducing the load on the air conditioning systems), are more compact, and offer better control and design flexibility. These LED retrofits will immediately reduce the school's maintenance staff workload due to the extended lifespan of the new LED technology. All lighting components will be readily available using standard off-the-shelf technology and selected based on ease of operation, product warranty and locally available support.

The scope of work for this measure is briefly described below:

- Existing 4ft surface mounted linear fluorescent fixtures, 2x4 recessed troffers, and pendant mounted fixtures will be replaced with LED light bar kits.
- Existing CFLs will be replaced with LED Pin Base Type B bulbs.
- Existing exterior cans will be retrofitted with LED can retrofit kits.
- Existing exterior fixtures will be replaced with new LED fixtures.
- Occupancy sensors for individual room controls will be added.
- Photo sensors will be installed on all exterior fixtures.
- Owner training on new equipment and warranty procedures.
- All work to be completed during the summer of 2023 (per attached project schedule but dependent on award timing).

FIM: Solar PV Renewable Energy Generation

Solar Photovoltaic (PV) systems are one of the best renewable energy generation options in Guam. Ordot Chalan Pago Elementary School is a great candidate for Solar PV since it has ample roof space and the electrical load to use all the energy generated by the panels. Electrical meter 36000151 could support a 35kW system. The preliminary assessment will look at overall facility demand and use Solar PV to reduce the electrical utility charges incurred.

The energy delivery from the array is estimated using Helioscope PV design software, that simulates the solar array output for a specific location, taking into account average weather data, architectural and environmental conditions. The model simulated monthly energy generation outputs.

The scope of work for this measure is briefly described below:

- Site assessment and structural and electrical engineering design
- Coordination with Department of Public Works for a building permit and Guam Power Authority for a standard interconnection agreement
- Install and commission a complete operational Solar PV system:
    - Top-tier PV modules suited for Guam's harsh environmental conditions
    - Smart PV inverters integrated with features to comply with utility requirements
    - Rapid shutdown during an emergency
    - Building integration to existing electrical equipment
    - Solar panel mounting hardware to withstand typhoon winds
- Owner training on new equipment and warranty procedures.
- All work to be completed during the summer of 2023 (per attached project schedule but dependent on award timing).

3.0 Project Budget

The table below shows a breakdown of the requested total budget for this project.

Subcontractor Direct Costs	Unit Price	Pricing Notes
LED Lighting Retrofit (labor, Materials & Wiring)	$262,081	Turn-key LED lighting upgrade price; Final subcontractor and lighting product selection will be competitively bid after grant award has been verified.
Solar PV	$190,362	Turn-key solar PV installation. Final subcontractor and product selection will be competitively bid after grant award has been verified
Other Direct Costs		
Energy Engineering Labor	$31,110	Engineering to support design, auditing, final product selection, photometric review, and grant savings reporting (pre & post construction)
Project Management Labor	$74,663	Support time for project & construction management as well as contract administration to comply with grant requirements
Account Manager	$10,012	
Insurance & Bonds	$6,844	Includes Insurance, Bonds and Permitting Costs
General Conditions	$24,888	Includes rentals, safety equipment, and grant compliance reporting
Misc./Retrofit Contingency	$43,553	Covers additional work uncovered to support upgrades (e.g. minor wiring code correction)
Warranty & Commissioning	$6,222	1-year correction period included with project
Owner Training	$3,111	Owner training on new equipment and warranty procedures
Travel	$14,622	Engineering and Project Manager travel expenses to Guam
Subtotal	$667,468	
Local Adjustment (Guam)	$33,373	Costs specific to Guam
Total EIC Grant Request:	$700,841	

4.0 Project Timeline

The timeline below was created with input and verification from local lighting contractors and engineering consultants. Expected project duration totals **180** days, taking into account working around school operating hours when classes are in session as well as local and federal holidays.

Milestone Description	Start	End	No. Days
Ordot Chalan Pago Elementary			
Submittals / Ordering / Material Lead Time	3/1/2023	5/30/2023	90
Mobilization	5/30/2023	6/13/2023	14
Installation	6/13/2023	8/2/2023	50
Punch List	8/2/2023	8/22/2023	20
De-Mobilize	8/23/2023	8/28/2023	6

The proposed project timeline above is built on GPA's previous experience executing LED lighting retrofits at Guam's Southern High School and George Washington High School in the villages of Santa Rita and Mangilao, respectively. These lighting retrofit projects were funded by DOI's Office of Insular Affairs from EIC 2018, and were completed less than four months from getting the Authorization to Proceed from the grant manager. Schedules however may also be affected by lead times of materials.

5.0 Project Statement of Need

The Guam Initial Technical Assessment Report by NREL, published in 2011 *(Appendix B, Section 2.2.3, P16)*, identified the Guam Department of Education in governmental sector as the second largest energy user; by percentage of total energy consumption (see Figure 16 below).

The Guam Department of Education was assessed to consume an average of 34,000 MWh of electricity which translates into a cost of $11.4 million a year. Among the uses of electricity, lighting usage was 26% of the total annual electricity consumption. It was the second highest next to air-conditioning usage (58%), according to the Final Energy Audit Report of Guam Public Schools, July 2013 by the Army Corps of Engineers and Helbert Hastert & Fee, Planners, Inc., funded by the US Dept. of the Interior Office of Insular Affairs *(See attached Appendix E)*. Said report recommended LED Lighting Upgrades and roof-mount PV systems (P6).

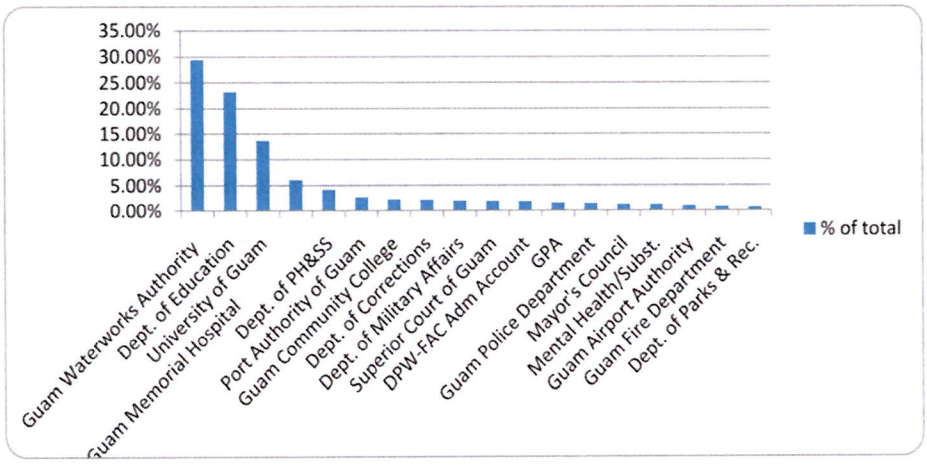


Figure 16. Guam government sector energy consumption by percentage of total energy consumption[27]
Source: NREL

The Guam Department of Education (GDOE) is the largest Government of Guam agency in terms of number of employees and real property assets. This department had been threatened several times in the past for non-payments of its utility bills due to higher energy consumption, as it translated into dollar figures. The impacts of power cut-off are significant since more than 30,000 public school students and thousands of employees are affected. The resulting impact will affect the primary purpose of educating the school children on Guam as mandated by laws.

6.0 Project Goals and Objectives

Project Goal(s)	Project Objectives
	The Facility Improvement Measures (FIM) include LED lighting upgrades and solar PV installation
1. Reducing overall Guam Department of Education current cost of electricity by at least 10%.	1. To complete submittals, ordering, and material lead time within 90 days from the date of grant award.
	2. To complete mobilization within 14 days period.
	3. To complete installation of LED lighting fixtures and Roof-top solar PV within 50 days
2. To contribute to the overall Guam Strategic Energy Plan by reducing cost of energy by 20% by 2020 (The 20/20 Plan).	4. To make sure Punch List is completed within 20 days.
	5. To demobilize within 6-day period after Punch List is fully completed.

7.0 Environmental Considerations

The Guam Power Authority is committed to ensuring compliance with all public laws and regulations, and attaining all necessary permits, clearances prior to initiating projects. Below are the Authority's preliminary findings regarding NEPA and NHPA compliance for this proposed project.

7.1 NEPA Compliance

Proposed actions in the project activities under this grant proposal have been identified as categorically excluded from the requirement of an Environmental Assessment or Environmental Impact Assessment. Consistent with Appendix A and Appendix B to Subpart D, 10 CFR 1021, the energy audits to be performed before lighting replacements, lamp replacements to LED fixtures, and development for small-scale renewable energy fall under CX A9 and CX B5, respectively; actions under these CX would not threaten a violation of applicable statutory, regulatory, or permit requirements for environment safety, and health, including requirements of DOE and/or Executive Orders; would not require siting and construction or major expansion of waste storage, disposal, recovery or treatment facilities; would not disturb hazardous substances, pollutants, contaminants, or CERCLA-excluded petroleum and natural gas products that preexist in the environment such that there would be uncontrolled or unpermitted releases; and would not adversely affect environmentally sensitive resources.

The described actions are not connected to other actions with potentially significant impacts and is not part of a proposed action that is or may be the subject of an Environmental Assessment or an Environmental Impact Statement. There are no extraordinary circumstances related to this action, and the proposal is not connected to other actions with potentially significant impacts.

See applicable excerpts from PART 1021 – NATIONAL POLICY ACT IMPLEMENTING PROCEDURES

§1021.410 Application of categorical exclusions (classes of actions that normally do not require EAs or EISs).

1.0 The actions listed in appendices A and B to this subpart D are classes of actions that DOE has determined do not individually or cumulatively have a significant effect on the human environment (categorical exclusions).

(b) To find that a proposal is categorically excluded, DOE shall determine the following:

(1) The proposal fits within a class of actions that is listed in appendix A or B to this subpart D;

(2) There are no extraordinary circumstances related to the proposal that may affect the significance of the environmental effects of the proposal. Extraordinary circumstances are unique situations presented by specific proposals, such as scientific controversy about the environmental effects of the proposal; uncertain effects or effects involving unique or unknown risks; or unresolved conflicts concerning alternate uses of available resources within the meaning of section 102(2)(E) of NEPA; and

(3) The proposal is not "connected" (40 CFR 1508.25(a)(1)) to other actions with potentially significant impacts, is not related to other proposed actions with cumulatively significant impacts (40 CFR 1508.25(a)(2)), and is not precluded by 40 CFR 1506.1 or §1021.211 of this part.

(c) All categorical exclusions may be applied by any organizational element of DOE. The sectional divisions in appendix B to this subpart D are solely for purposes of organization of that appendix and are not intended to be limiting.

(d) A class of actions includes activities foreseeably necessary to proposals encompassed within the class of actions (such as associated transportation activities and award of implementing grants and contracts).

Appendix A to Subpart D of Part 1021 -- Categorical Exclusions Applicable to General Agency Actions

A9 Information gathering (including, but not limited to, literature surveys, inventories, audits), data analysis (including computer modelling), document preparation (such as conceptual design or feasibility A9 Information gathering (including, but not limited to, literature surveys, inventories, audits), data analysis (including computer modelling), document preparation (such as conceptual design or feasibility studies, analytical energy supply and demand studies), and dissemination (including, but not limited to, document mailings, publication, and distribution; and classroom training and informational programs), but not including site characterization or environmental monitoring.

Appendix B to Subpart D of Part 1021 -- Categorical Exclusions Applicable to

Specific Agency Actions

B5 Categorical Exclusions Applicable to Conservation, Fossil, and Renewable Energy Activities.

B5.1 Actions to conserve energy, demonstrate potential energy conservation, and promote energy-efficiency that do not increase the indoor concentrations of potentially harmful substances. These actions may involve financial and technical assistance to individuals (such as builders, owners, consultants, designers), organizations (such as utilities), and state and local governments.

Covered actions include but are not limited to: programmed lowering of thermostat settings, placement of timers on hot water heaters, installation of solar hot water systems, installation of efficient lighting, improvements in generator efficiency and appliance efficiency ratings, development of energy-efficient manufacturing or industrial practices, and small-scale conservation and renewable energy research and development and pilot projects. The actions could involve building renovations or new structures in commercial, residential, agricultural, or industrial sectors. These actions do not include rulemakings, standard-settings, or proposed DOE legislation.

7.2 National Historic Preservation Act Section 106

The site of Ordot Chalan Pago Elementary School campus was never identified as a site with historical significance; however, several buildings on campus were erected in 1997, and are over 24 years of age. All work under this project are within normal building maintenance work. GPA is confident that the Guam State Historic Preservation Office will be able to confidently deem that the project does not impact any historic properties upon Section 106 review.

8.0 Conflict of Interest Disclosure

Regarding the proposed actions in the funding opportunity application, there are no existing conflicts of interests to disclose at this time. GPA agrees to disclose in writing information should there be any instances of conflict of interest during the project execution to the DOI awarding agency as soon as it is known.

We understand that failure to resolve conflicts of interest in a manner that satisfies the government may be cause for termination of the award. Failure to make required disclosures may result in any of the remedies described in 2 CFR §200.339, Remedies for noncompliance, including suspension or debarment

9.0 Uniform Audit Reporting Statement

GPA is requesting a total funding of $700,841 for the execution of this project. GPA acknowledges that, in accordance with 2 CFR 200 subpart F, All U.S. states, local governments, federally recognized Indian tribes, institutions of higher education, and non- profit organizations expending $750,000 USD or more in Federal award funds in the applicant's fiscal year must submit a Single Audit report for that year through the Federal Audit Clearinghouse's Internet Data Entry System.

There were no grant expenditures in FY20 and FY21 except for the $15M ARP monies. All grant expenditures were audited in FY19 when we incurred the expenses. The residual balance of expenditures for those 2 grants were too small to meet the threshold for the audit in FY20.

10.0 Certification Regarding Lobbying

GPA certifies the statements in 43 CFR Part 18 Appendix A – Certification Regarding Lobbying:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

(3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

11.0 Disclosure of Lobbying Activities

GPA understands that applicants and recipients must not use any federally appropriated funds (annually appropriated or continuing appropriations) or matching funds under a Federal award to pay any person for lobbying in connection with the award. At this time, there are no lobbying activities to disclose.

12.0 Overlap or Duplication of Effort Statement

There are no overlaps or duplication between this application and any of our other Federal applications or funded projects, including in regards to activities, costs, or time commitment of key personnel

13.0 Indirect Cost Statement

GPA is a government utility under a U.S. territory that will charge all costs directly.

14.0 Project Outcomes

Below are the expected savings and sample calculations for this project.

Energy Savings Calculations

Savings generated by lighting retrofits shall be based upon the pre and post kW and lighting burn hours. Manufacturer cut sheets will be used for pre and post kW readings.

KW Savings = Pre KW – Post KW

Annual KWH Savings = Pre Lighting Burn Hours x Pre KW – Post Lighting Burn Hours x Post KW

Annual KW Demand Savings = KW savings x demand months

Annual Dollar Savings ($) = KWH Savings x $/KWH Rate + kW demand savings x $/kW rate

Lifetime Energy Savings ($) = Annual Dollar Savings ($) x 10 (Assumed LED lifespan in Years)

Ordot Chalan Pago Elementary School - Savings Summary

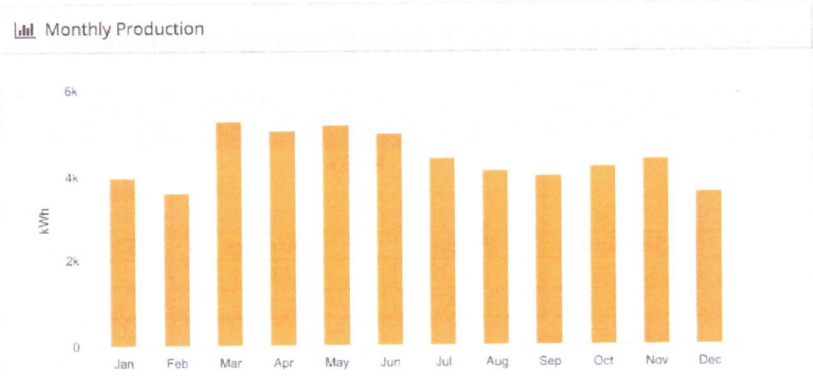
Ordot Chalan Pago Elementary School Savings Calculations[1]				
FIM 1. LED Lighting Retrofit				
$/kWh =		**$0.33**		**Anticipated Annual Energy Savings > 15% = YES**
Annual Energy Units	**Baseline**	**Proposed**	**Savings**	**Electrical Savings (%)**
Lighting kWh	130,211	50,390	79,821	61%
Lighting kW	66	37	29	
Dollar Savings				
Lighting Savings	$26,341			
Lifetime Savings	$263,410			assuming 10 years life
FIM 2. Renewable Energy Solar PV				
System Size:	35.1 KW			
Energy generated:	53,021 kWh			
Energy value:	$17,497			
Annual O&M Cost:	$500			
Structural design:	195+ mph wind			
Lifetime Savings	$262,455			Assuming 15 years life
Total Energy Savings from all Measures:				
Total Annual Energy value:	$43,838			

[1] *Savings were identified during an ASHRAE Level 1 audit and only account for electrical savings.*

Solar PV Energy Delivery Calculation:

Ordot Chalan Pago Elementary School – Solar PV System

Ordot Chalan Pago Elementary School – Helioscope Simulated Monthly Generation



Month	GHI (kWh/m²)	POA (kWh/m²)	Shaded (kWh/m²)	Nameplate (kWh)	Grid (kWh)
January	123.7	134.5	134.0	4,460.4	4,012.5
February	115.1	121.7	121.3	4,033.5	3,632.3
March	171.5	176.8	176.2	5,894.2	5,278.9
April	170.1	169.5	168.9	5,635.6	5,054.6
May	180.8	175.0	174.4	5,818.4	5,193.8
June	177.2	168.8	168.2	5,608.1	4,996.8
July	155.4	149.8	149.3	4,968.8	4,439.7
August	141.4	139.4	138.8	4,611.8	4,120.6
September	134.6	136.4	135.8	4,529.3	4,024.8
October	137.7	143.5	142.9	4,748.2	4,235.7
November	136.2	148.3	147.7	4,922.4	4,398.4
December	112.3	122.0	121.5	4,032.2	3,632.6

Ordot Chalan Pago Elementary School – Production Report Summary

HelioScope — Annual Production Report produced by Megan Ferguson

Annual Production

	Description	Output	% Delta
Irradiance (kWh/m²)	Annual Global Horizontal Irradiance	1,755.9	
	POA Irradiance	1,785.8	1.7%
	Shaded Irradiance	1,779.2	-0.4%
	Irradiance after Reflection	1,722.7	-3.2%
	Irradiance after Soiling	1,688.2	-2.0%
	Total Collector Irradiance	**1,688.2**	**0.0%**
Energy (kWh)	Nameplate	59,262.7	
	Output at Irradiance Levels	58,960.6	-0.5%
	Output at Cell Temperature Derate	55,621.1	-5.7%
	Output After Mismatch	55,621.1	0.0%
	Optimizer Output	54,842.4	-1.4%
	Optimal DC Output	54,788.7	-0.1%
	Constrained DC Output	54,614.2	0.3%
	Inverter Output	53,287.2	-2.4%
	Energy to Grid	**53,020.7**	**-0.5%**
Temperature Metrics			
	Avg. Operating Ambient Temp		28.2 °C
	Avg. Operating Cell Temp		35.9 °C
Simulation Metrics			
	Operating Hours		4616
	Solved Hours		4616

Condition Set

Description	Condition Set 1
Weather Dataset	TMY, Guam Wfo, TMY3 (epw)
Solar Angle Location	Meteo Lat/Lng
Transposition Model	Perez Model
Temperature Model	Sandia Model

Temperature Model Parameters

Rack Type	a	b	Temperature Delta
Fixed Tilt	-3.56	-0.075	3°C
Flush Mount	-2.81	-0.0455	0°C

Soiling (%)

J	F	M	A	M	J	J	A	S	O	N	D
2	2	2	2	2	2	2	2	2	2	2	2

Irradiation Variance	5%
Cell Temperature Spread	4° C
Module Binning Range	-2.5% to 2.5%
AC System Derate	0.50%

Module Characterizations	Module	Uploaded By	Characterization
	Q.PEAK DUO XL-G9.3 450 (Hanwha Q CELLS)	Folsom Labs	Spec Sheet Characterization, PAN

Component Characterizations	Device	Uploaded By	Characterization

Fuel Savings Calculations

Savings generated by lighting retrofits and PV offset shall be based upon kWh savings calculated above.

$$\frac{Energy\ Savings}{year} \text{ X } \frac{fuel\ used}{kWh} = \text{Fuel Reduction per year}$$

$$\frac{132{,}842\ kWh}{year} \text{ X } \frac{1\ gallon}{14.15\ kWh} = \textbf{9,388.13 gallons in Fuel Reduction per year}$$

Ordot Chalan Pago Elementary School – Avoided Fuel Burned

Ordot Chalan Pago Elementary School Fuel Reduction Calculations			
Gallon/kWh		1 gallon / 14.15 kWh	
Annual Fuel Units	Baseline	Proposed	Savings
Plant Fuel in Gallons	12,949.26	3,561.13	9,388.13
Gallon Reductions		BBL Reduction	
9,388		**224**	

15.0 Priority Listing

	Project Name	Requested Amount
1	Reducing Negative System Impact of Solar PV to Guam's Grid: Relay Upgrade Project	$ 4,147,019
2	Creating Synergies for Reducing Renewable Energy Project Land Siting Costs	$3,421,712
3	Integration of Grid Controller with Automatic Generation Control to Support High Penetration of Renewable Energy	$2,070,000
4	BEST Schools Program: University of Guam School Facility Building Automation and Electric Power Quality Testing	$2,262,945
5	BEST Schools Program: Ordot Chalan Pago Elementary School	$700,841
6	BEST Schools Program: Machananao Elementary School	$780,164
7	BEST Schools Program: Wettengel Elementary School	$707,902
8	BEST Schools Program: M.U. Lujan Elementary School	$759,562

16.0 Grant Recipient

Name	John M. Benavente, PE
Title	General Manager
Mailing Address	Gloria B. Nelson Public Service Building 688 Route 15 Mangilao, Guam 96913-1255
Phone Number	(671) 648-3201
Fax Number	(671) 648-3167
Email Address	jbenavente@gpagwa.com

17.0 Recipient Grant Manager

Provided below are the day-to-day Grant Managers

Name	John J. Cruz Jr., PE
Title	Assistant General Manager
Mailing Address	Gloria B. Nelson Public Service Building 688 Route 15 Mangilao, Guam 96913-1255
Phone Number	(671) 648-3206
Fax Number	(671) 648-3167
Email Address	jcruz@gpagwa.com
Name	Francis J. Iriarte, PE, CEA, CEM
Title	Engineer Supervisor
Mailing Address	Gloria B. Nelson Public Service Building 688 Route 15 Mangilao, Guam 96913-1255
Phone Number	(671) 648-3102
Fax Number	(671) 648-3167
Email Address	firiarte@gpagwa.com

18.0 Applicant Status With OIA

GPA has a long history of successful execution of federally funded assistance agreements. Notable agencies include the U.S. Department of Interior, U.S. Department of Energy, and U.S. Department of Homeland Security. The table below summarizes the most relevant assistance agreements performed by GPA.

No.	Project Title	Agreement No.	Funding Agency and CFDA	Total Budget	Federal Share
1	Smart Grid Investment	SGID DE-OE0000252	Dept. of Energy 81.122	$ 33,213,756	$ 16,603,507
2	Wind Turbine Pilot	GUAM-EIC-2015-1 D15AP00028	Dept. of Interior 15.875	$ 2,102,000	$ 2,102,000 (Reimbursed cost)
3	Southern High School LED Retrofit	D18AP00208	Dept. of Interior 15.875	$954,685	$954,685 (Reimbursable cost) Completed
4	George Washington High School LED Retrofit	D18AP00209	Dept. of Interior 15.875	$295,315	$295,315 (Reimbursable cost) Completed
5	Guam Power Authority - Fadian Public-Access Lot Solar PV Canopy System.	D19AP00168	Dept. of Interior 15.875	$620,428	(Reimbursable cost) Ongoing, Expected Completion by December, 2023
6	Maria Ulloa Elementary School LED Retrofit	D19AP00169	Dept. of Interior 15.875	$522,616	(Reimbursable cost) Completed
7	Agueda Johnston Middle School LED Retrofit	D19AP00170	Dept. of Interior 15.875	$586,771	(Reimbursable cost) Ongoing, Expected Completion by December, 2022
8	University of Guam LED Lighting Retrofit, HVAC Control, & Solar PV Renewable Energy Generation	D21AP10226-00	Dept. of Interior 15.875	$1,291,938	(Reimbursable cost) Ongoing, Expected Completion by December, 2023
9	Tamuning Elementary School LED Lighting Upgrades	D21AP10231-00	Dept. of Interior 15.875	$154,526.85	(Reimbursable cost) Ongoing Expected Completion by December, 2023

19.0 ASAP Identification Number

The Guam Power Authority ASAP Number: 6653012

20.0 Federal Assistance Standard Forms

Appendix G

21.0 Appendices

Appendix A	Guam Strategic Energy Plan
Appendix B	Guam Initial Technical Assistance Report
Appendix C	GPA Docket No. 18-11
Appendix D	Guam Education Board Resolution No. 2022-02
Appendix E	Insular Schools Full Energy Audit Report, July 2013
Appendix F	Preliminary Feasibility Assessment of GDOE Schools, Nov 2018
Appendix G	Federal Assistance Standard Forms
Appendix H	Letter of Support – Governor of Guam
Appendix I	Letter of Support – Guam Energy Office

The GCMP Assessment Format and Supplemental Information Form may be reproduced and submitted along with other required information to the BSP.

GUAM COASTAL MANAGEMENT PROGRAM
ASSESSMENT FORMAT

DATE OF APPLICATION: 3/3/2023
NAME OF APPLICANT: Guam Power Authority
ADDRESS: 688 Rt. 15, Mangilao, GU 96913
TELEPHONE NO. 648-3206 Fax No. 648-3167 Cell No: -
E-MAIL ADDRESS: jcruz@gpagwa.com

TITLE OF PROPOSED PROJECT:
BEST Schools Program - Ordot Chalan Pago Elementary School LED Lighting Upgrades & Solar PV Renewable Energy Generation: Energy Conservation Project

COMPLETE FOLLOWING PAGES

FOR BUREAU OF STATISTICS AND PLANS ONLY:

DATE APPLICATION RECEIVED: _____
OCRM NOTIFIED: _____ LIC. AGENCY NOTIFIED: _____
APPLICANT NOTIFIED: _____ PUBLIC NOTICE GIVEN: _____
OTHER AGENCY REVIEW
REQUESTED: _____

DETERMINATION:
( ) CONSISTENT ( ) NON-CONSISTENT ( ) FURTHER INFORMATION REQUESTED

OCRM NOTIFIED: _____ LIC. AGENCY NOTIFIED: _____
APPLICANT NOTIFIED: _____
ACTION LOG:
1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

DATE REVIEW COMPLETED: _____

DEVELOPMENT POLICIES (DP):

DP 1. Shore Area Development

Intent: To ensure environmental and aesthetic compatibility of shore area land uses.

Policy: Only those uses shall be located within the Seashore Reserve which:
- enhance, are compatible with or do not generally detract from the surrounding coastal area's aesthetic and environmental quality and beach accessibility; or
- can demonstrate dependence on such a location and the lack of feasible alternative sites.

Discussion: Not applicable. Project is not located on or near Guam's shoreline. The entire project scope is confined to the Ordot Chalan Pago Elementary School campus in Ordot, Guam.

DP 2. Urban Development

Intent: To cluster high impact uses such that coherent community design, function, infrastructure support and environmental compatibility are assured.

Policy: Commercial, multi-family, industrial and resort-hotel zone uses and uses requiring high levels of support facilities shall be concentrated within appropriate zone as outlined on the Guam Zoning Code.

Discussion: Not applicable. Project is located within an educational building.

DP 3. Rural Development

Intent: To provide a development pattern compatible with environmental and infrastructure support suitability and which can permit traditional lifestyle patterns to continue to the extent practicable.

Policy: Rural districts shall be designated in which only low density residential and agricultural uses will be acceptable. Minimum lot size for these uses should be one-half acre until adequate infrastructure including functional sewering is provided.

Discussion: Not applicable. Project includes replacing existing lights with LED fixtures, installing rooftop solar PV panels.

DP 4. Major Facility Siting

Intent: To include the national interest in analyzing the siting proposals for major utilities, fuel and transport facilities.

Policy: In evaluating the consistency of proposed major facilities with the goals, policies, and standards of the Comprehensive Development and Coastal Management Plans, Guam shall recognize the national interest in the siting of such facilities, including those associated with electric power production and transmission, petroleum refining and transmission, port and air installations, solid waste disposal, sewage treatment, and major reservoir sites.

Discussion: Not applicable. This project does not include construction of facilities for the purpose of utility-scale power generation, power transmission, petroleum refining and transmission, port and air installations, solid waste disposal, sewage treatment, or water reservoirs.

DP 5. Hazardous Areas

Intent: Development in hazardous areas will be governed by the degree of hazard and the land use regulations.

Policy: Identified hazardous lands, including flood plains, erosion-prone areas, air installations' crash and sound zones and major fault lines shall be developed only to the extent that such development does not pose unreasonable risks to the health, safety or welfare of the people of Guam, and complies with the land use regulations.

Discussion: Not applicable. The project does not include development in hazardous areas.

DP 6. Housing

Intent: To promote efficient community design placed where the resources can support it.

Policy: The government shall encourage efficient design of residential areas, restrict such development in areas highly susceptible to natural and manmade hazards, and recognize the limitations of the island's resources to support historical patterns of residential development.

Discussion: Not applicable. The project site is not in a residential area.

DP 7. Transportation

Intent: To provide transportation systems while protecting potentially impacted resources.

Policy: Guam shall develop an efficient and safe transportation system, while limiting adverse environmental impacts on primary aquifers, beaches, estuaries, coral reefs and other coastal resources.

Discussion: Not applicable. The project does not include development of transportation systems.

DP 8. Erosion and Siltation

Intent: To control development where erosion and siltation damage is likely to occur.

Policy: Development shall be limited in areas of 15% or greater slope by requiring strict compliance with erosion, sedimentation, and land use regulations, as well as other related land use guidelines for such areas.

Discussion: Not applicable. Project site is confined to the Ordot Chalan Pago Elementary School campus in Ordot, Guam.

RESOURCES POLICIES (RP):

RP 1. Air Quality

Intent: To control activities to insure good air quality.

Policy: All activities and uses shall comply with all local air pollution regulations and all appropriate Federal air quality standards in order to ensure the maintenance of Guam's relatively high air quality.

Discussion: Not applicable. The project will not adversely affect air quality.

RP 2. Water Quality

Intent: To control activities that may degrade Guam's drinking, recreational, and ecologically sensitive waters.

Policy: Safe drinking water shall be assured and aquatic recreation sites shall be protected through the regulation of uses and discharges that pose a pollution threat to Guam's waters, particularly in estuaries, reef and aquifer areas.

Discussion: Not applicable. Project will not produce discharge that interferes with Guam's waters; especially estuaries, reef, and aquifer areas.

RP 3. Fragile Areas

Intent: To protect significant cultural areas, and natural marine and terrestrial wildlife and plant habitats.

Policy: Development in the following types of fragile areas including Guam's Marine Protected Areas (MPA) shall be regulated to protect their unique character.

- historical and archeological sites
- wildlife habitats
- pristine marine and terrestrial communities
- limestone forests
- mangrove stands and other wetlands
- coral reefs

Discussion: Not applicable. Project will not be conducted on any significant cultural areas, natural marine, terrestrial wildlife, or plant habitats.

RP 4. Living Marine Resources

Intent: To protect marine resources in Guam's waters.

Policy: All living resources within the waters of Guam, particularly fish, shall be protected from over harvesting and, in the case of corals, sea turtles and marine mammals, from any taking whatsoever.

Discussion: Not applicable. Project will not interfere with marine resources.

RP 5. Visual Quality

Intent: To protect the quality of Guam's natural scenic beauty

Policy: Preservation and enhancement of, and respect for the island's scenic resources shall be encouraged through increased enforcement of and compliance with sign, litter, zoning, subdivision, building and related land-use laws. Visually objectionable uses shall be located to the maximum extent practicable so as not to degrade significant views from scenic overlooks, highways and trails.

Discussion: Not applicable. Project will be contained within the Ordot Chalan Pago Elementary School campus in Ordot, Guam. Construction work will not drastically alter its appearance in any noticeable way.

RP6. Recreation Areas

Intent: To encourage environmentally compatible recreational development.

Policy: The Government of Guam shall encourage development of varied types of recreational facilities located and maintained so as to be compatible with the surrounding environment and land uses, adequately serve community centers and urban areas and protect beaches and such passive recreational areas as wildlife, marine conservation and marine protected areas, scenic overlooks, parks, and historical sites.

Developments, activities and uses shall comply with the Guam Recreational Water Use Management Plan (RWUMP).

Discussion: Not applicable. Project does not include the development of a recreational facility.

RP 7. Public Access

Intent: To ensure the right of public access.

Policy: The public's right of unrestricted access shall be ensured to all non-federally owned beach areas and all Guam recreation areas, parks, scenic overlooks, designated conservation areas and their public lands. Agreements shall be encouraged with the owners of private and federal property for the provision of releasable access to and use of resources of public nature located on such land.

Discussion: Not applicable. Project site is not located on a non-federally owned beach, park, scenic overlook, designated conservation area, or other public land.

RP 8. Agricultural Lands

Intent: To stop urban types of development on agricultural land.

Policy: Critical agricultural land shall be preserved and maintained for agricultural use.

Discussion: Not applicable. Project site is not located on agricultural land.

FEDERAL CONSISTENCY
SUPPLEMENTAL INFORMATION FORM
Date: 3/3/2023

Project/Activity Title or
Description LED lighting retrofit and Solar PV installation

Location: Ordot Chalan Pago Elementary School

Other applicable area(s) affected, if appropriate:

Est. Start Date: _____ Est. Duration: 120days

APPLICANT

Name & Title Victor Torres, Engineer III

Agency/Organization Guam Power Authority

Address Gloria B. Nelson Public Service Bldg. 688 Rt 15

Mangilao, GU Zip Code 96913

Telephone No. during business hours:
A/C (671) 300-8341
A/C (___) _____
Fax (671) 648-3167

E-mail Address: vatorres@gpagwa.com

AGENT
Name & Title _____
Agency/Organization Address _____ Zip Code _____

Telephone No. during business hours:

A/C (___) _____
A/C (___) _____
Fax (___) _____

E-mail Address: _____

CATEGORY OF APPLICATION (check one only)

( ) I - Federal Agency Activity
( ) II - Federal Permit or License
(X) III - Federal Grants & Assistance

TYPE OF STATEMENT (check one only)

(X) Consistency
( ) General Consistency (Category I only)
( ) Negative Determination (Category I only)
( ) Non-Consistency (Category I only)

APPROVING FEDERAL AGENCY (Categories II & III only)

Agency Bureau of Statistics and Plans (GCMP)

Contact Person Julian Janssen, Federal Activities Planner; Lola E. Leon Guerrero, Director

Telephone No. during business hours:

Area Code (671) 475-9664
Area Code ( )_____

FEDERAL AUTHORITY FOR ACTIVITY

Title of Law_____
Section _____

OTHER GUAM APPROVALS REQUIRED:

Agency	Type of Approval	Date of Application	Status