32nd Pacific Power Association Annual Conference

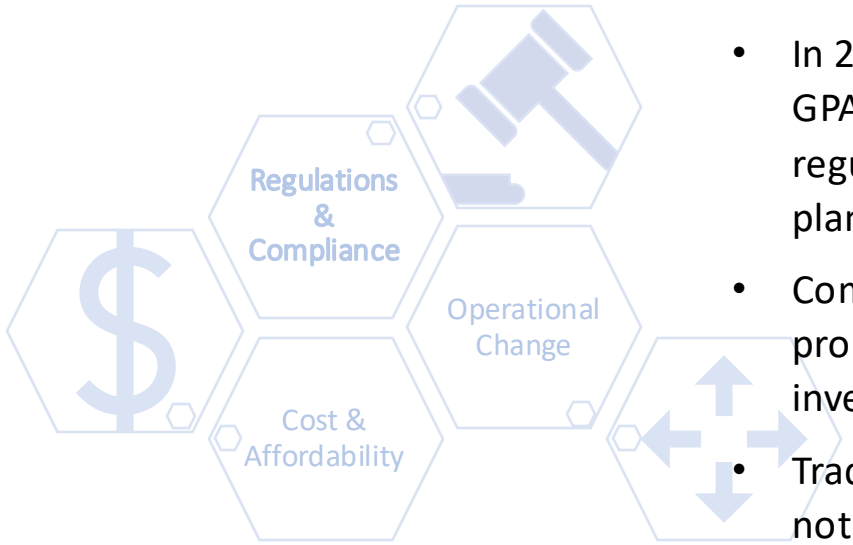
THE PARADIGM SHIFT IN DIVERSITY AND SUPPLY OF ENERGY

September 23, 2025
Ngarachamayong Cultural Center
Koror, Republic of Palau

JOHN M. BENAVENTE, P.E.
General Manager
GUAM POWER AUTHORITY

The Paradigm Shift In Diversity & Supply of Energy

WHY THE NEED TO SHIFT FROM A SINGLE SOURCE OF ENERGY?

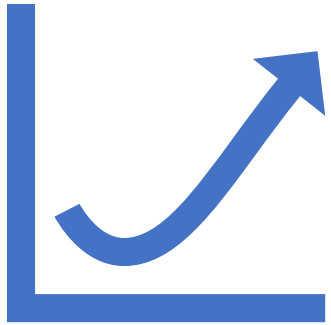
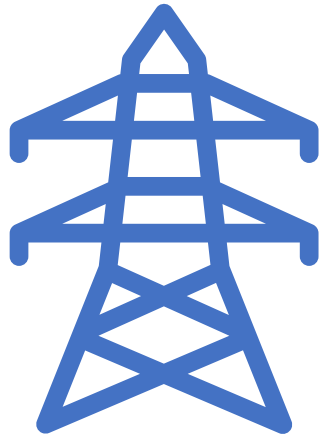


GPA's goal – to provide its ratepayers with clean, reliable, affordable energy on a sustained basis – has not been entirely met in the Authority's 57 years since its establishment.

- Prior to 2015, Guam's only source of energy was fuel oil (diesel and dirty residual fuel oil).
- Fuel oil prices, significantly influenced by geopolitical events, often negatively impact affordable energy rates for GPA customers.
- Despite being thousands of miles away from the continental U.S., Guam falls under US EPA Region IX jurisdiction.
- In 2012, US EPA revoked a decades-long exemption that allowed the U.S. military then GPA, to burn cheaper heavy residual fuel oil. GPA was ordered to comply with stringent regulations requiring an alternate fuel type and costly investments in the aged power plants.
- Compliance with the national mandates amplified the negative impacts on the cost to produce and sell energy on Guam, significantly impacting ratepayers and deterred new investment activities on Guam.
- Traditional energy costs on Guam negatively impact the island's economy because it does not have multiplying affects.
- Oil-to-Jobs became an integral objective for the economic health of Guam.

Affordable, Reliable & Resilient Energy on a Sustained Basis

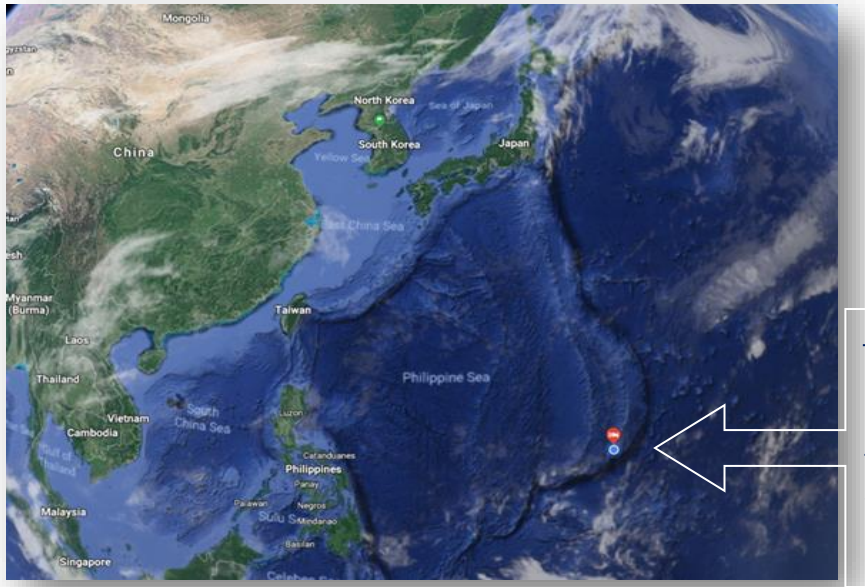
The journey to affordable, reliable and resilient energy on a sustained basis starts with planning…

				
Our Business	Challenges & Threats	Paradigm Shift of Our Energy Supply	Grid Infrastructure: Reliability & Resiliency	Key Support Services

Our Business

Guam Power Authority - Overview

GPA is the sole provider of electricity in Guam, including to the US military bases



Distance fr Guam to:
NMI 136 mi
Palau 805 mi
Pohnpei 1,022 mi
Tokyo 1,567 mi
Seoul 1,874 mi
Hawaii 3,950 mi
California 5,974 mi

160,000
in Population

$546M
in Revenues[1]

264 MW
in Peak Demand[1]

379 MW
Oil Fired Generation

85.3 MW
Renewable Generation

53,777
Meters[1]

$823M
in Assets

1.6M MWh
In Energy Sales[1]

30 Substations
Conversion to indoor type underway

1,839 Miles
Combined Transmission & Distribution Lines

1. For fiscal year September 30, 2024

Utility Commission & Management Team

Consolidated Commission on Utilities (CCU)

Simon A. Sanchez, II
Commissioner

Melvin Duenas
Secretary

Francis Santos
Chairman

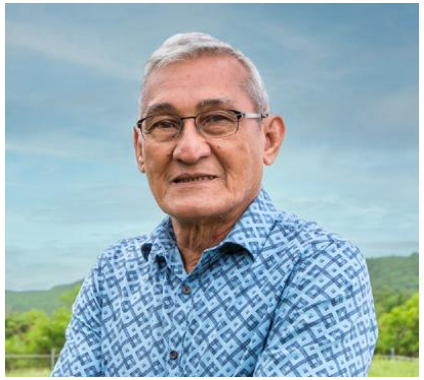
Pedro Roy Martinez
Vice Chairman

Michael Limtiaco
Commissioner

GPA is an autonomous public corporation of the government of Guam, governed by the CCU, an elected five-member commission

Rates are subject to regulations and approval by the Guam Public Utilities Commission (PUC)

Guam Power Authority Senior Management



John M. Benavente, P.E.
General Manager

Jennifer G. Sablan, P.E.
Assistant General Manager, Operations

Beatrice P. Limtiaco
Assistant General Manager, Administration

John J. Cruz, Jr., P.E.
Assistant General Manager, Engineering & Technical Services

John J.E. Kim, CPA
Chief Financial Officer

Marianne Woloschuk
Staff Attorney

GPA is financially independent with no reliance on subsidies from GovGuam

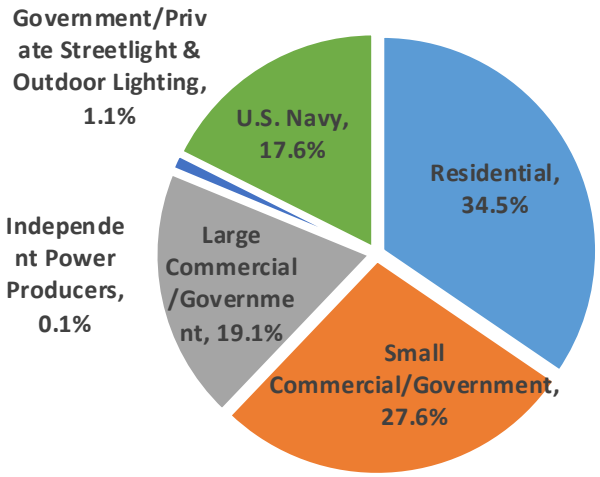
No taxes or PILOTs are paid by GPA to GovGuam

Diversified Customer Base

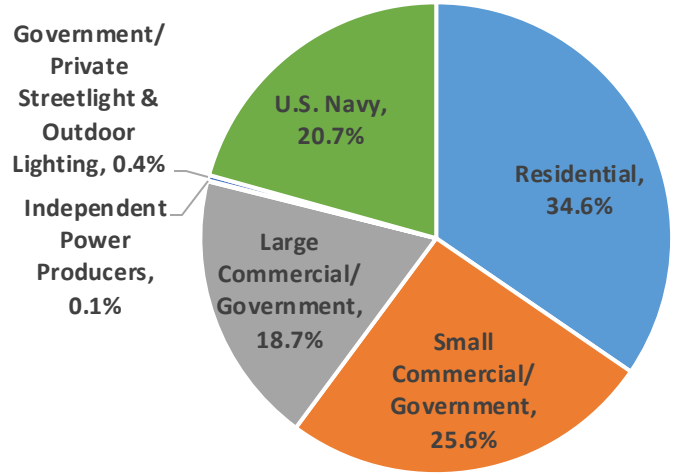
GPA has a diverse customer base and has been a long-term energy provider to the U.S. military

FY 2024 Electric Revenue Composition ($MM)

Segment (In $ in Millions)	Revenue
Residential	$ 187.4
Small Commercial/Government	149.8
Large Commercial/Government	103.6
Independent Power Producers	0.4
Government/Private Streetlight & Outdoor Lighting	6.0
U.S. Navy	95.6
Total	$ 542.8



2024 Energy Sales Composition (MWh)



FY 2024 Largest Customers

Customer		Industry	Sales (GWh)	Sales ($MM)	% of Revenues
1	U.S. Dept. of Defense - Navy	Military	321.8	$ 95.6	17.6%
2	Guam Waterworks Authority	Utilities	57.2	21.9	4.0%
3	Department of Education	Government	37.5	15.0	2.8%
4	Guam Airport Authority	Transportation	21.8	7.7	1.4%
5	Pacific Island Club (PIC)	Hotel	12.5	4.1	0.8%
6	Hyatt Regency Guam	Hotel	10.3	3.4	0.6%
7	University of Guam	Government	10.1	4	0.7%
8	Guam Regional Medical City	Hospital	9.3	3.2	0.7%
9	GTA Teleguam	Telecom	9.3	3.3	0.6%
10	Guam Memorial Hospital	Hospital	9.0	2.9	0.5%
		Total	**498.8**	**$ 161.1**	**29.7%**

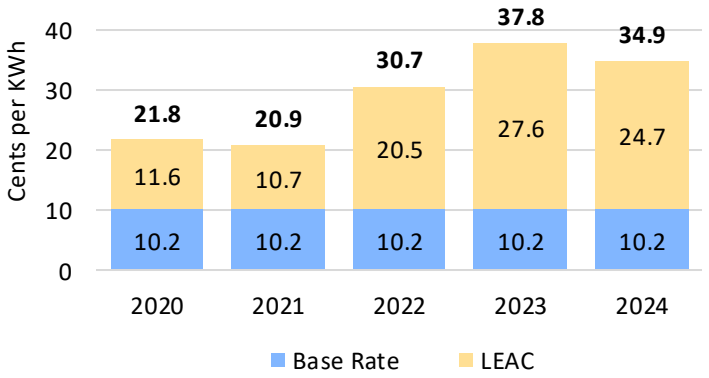
Source: Guam Power Authority.

Financial Results

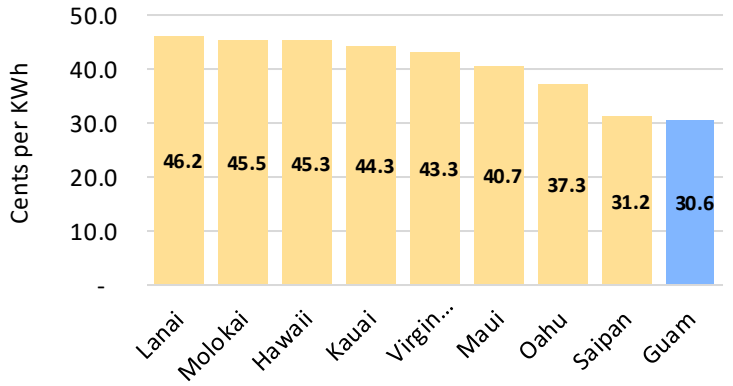
Rate Structure

GPA recovers fixed costs through its Base Rate, fuel costs through the semi-annual Levelized Energy Adjustment Clause (LEAC), and any cost recovery through available surcharges

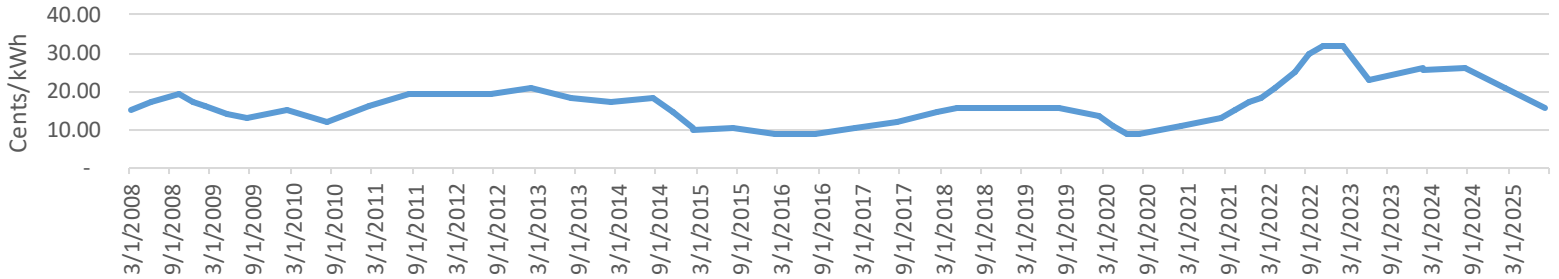
GPA System Average Rates (Fiscal Year)



Residential Rate Comparison(1)



LEAC Semi-Annual Adjustments



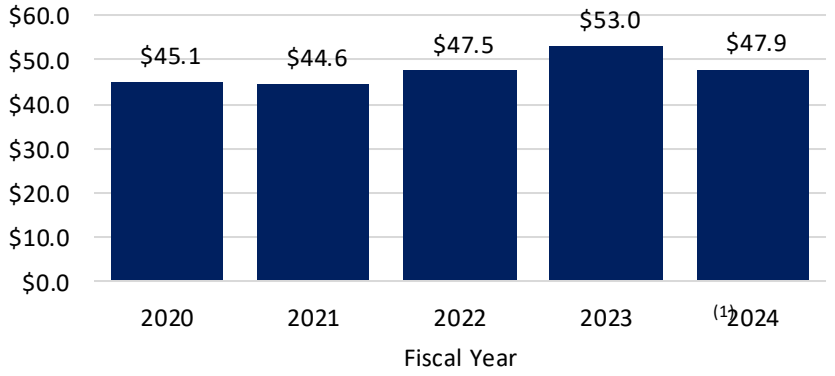
Surcharges are automatically available for working capital and self-insurance cost recovery

Source: Guam Power Authority.
(1) Rates for Guam as of February 1, 2025; Rates for Kauai, Oahu, Molokai, Lanai, Hawaii and Maui as of February 1, 2025; Rates for Saipan as of February 1, 2025; and Rates for Virgin Islands as of March 1, 2022.

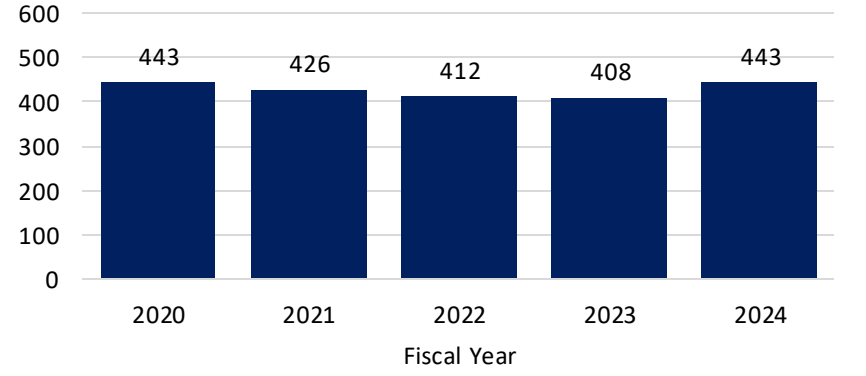
Operating Metrics

GPA's initiatives and efficiency gains are providing agency-wide cost savings

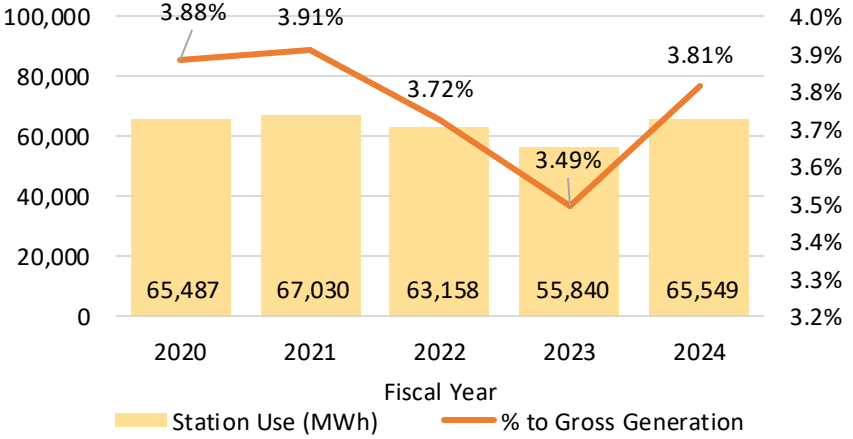
Payroll Expenditures ($MM)



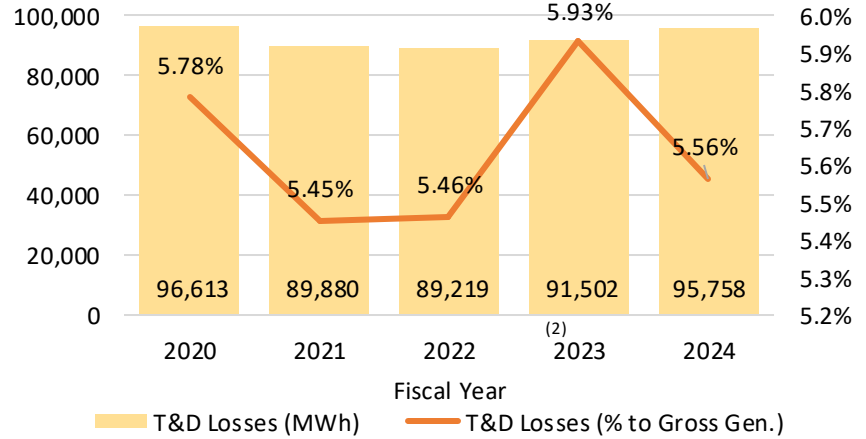
Headcount



Greater Station Energy Efficiencies (MWh)



Line Losses (MWh)



Source: Guam Power Authority.

(1) Increase in overtime expense due to Typhoon Mawar recovery effort.

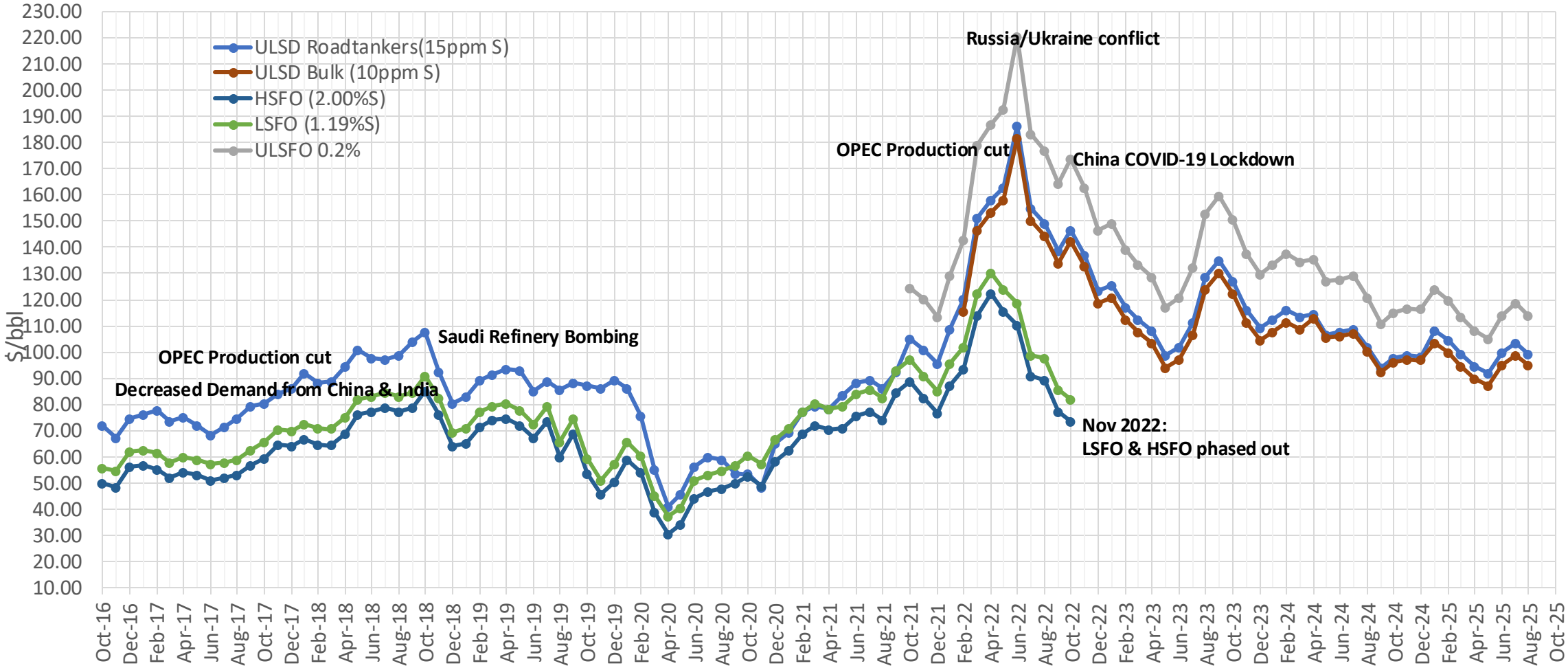
(2) Greater line loss due to Typhoon Mawar damage to 115 kV transmission line.

Fuel Costs

Landed cost per barrel as of August 19, 2025

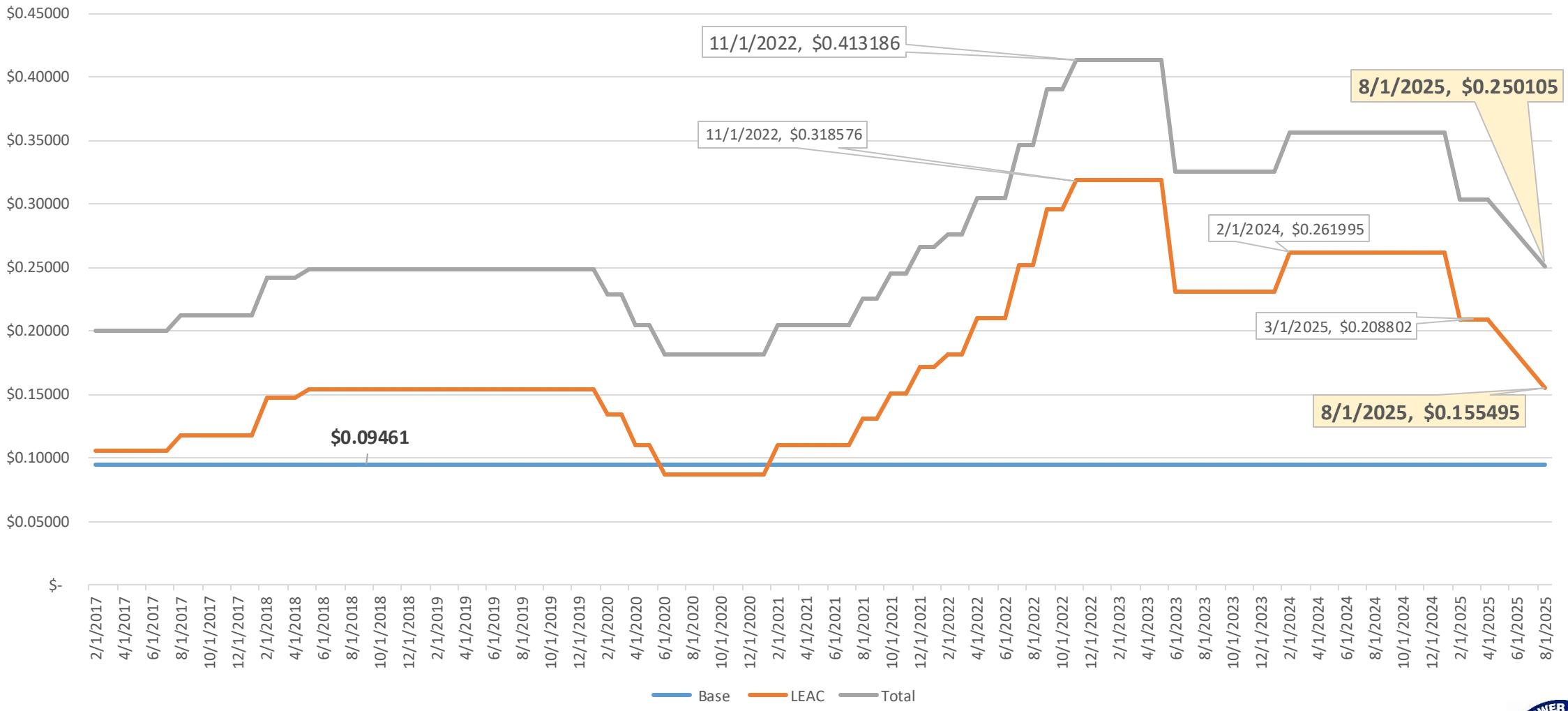
ULSRFO 0.2% $113.55 **ULSD Bulk** $94.61

- Fuel prices continue to fluctuate but are generally trending downward
- Cabras 1 & 2 burn the most expensive fuel (ULS RFO)
- Current LEAC Rate: **$0.155495/kWh**, effective 08/01/2025 to 01/31/2026



Levelized Energy Adjustment Clause Rate (LEAC)

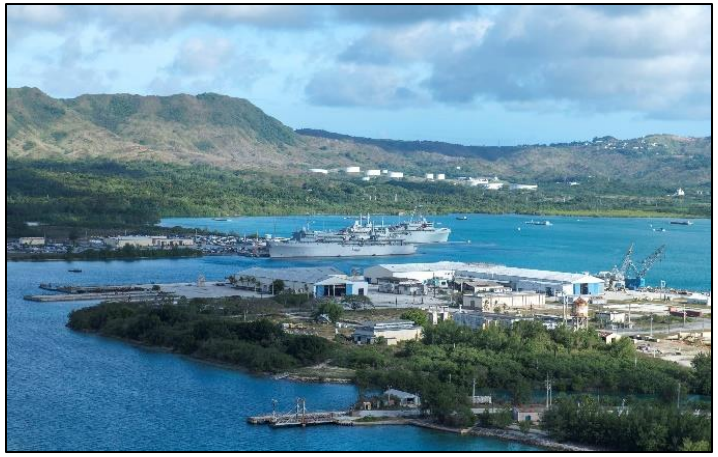
Historical LEAC Residential LEAC Rate



GPA-Navy Customer Agreement

U.S. Navy renewed its 10-year electricity contract with GPA in 2022

- U.S. Military has been a customer of GPA for the past 32 years
- GPA renewed its Utility Service Contract (USC) with the U.S. Navy
  - Renewed agreement is similar to prior contract with the U.S. Navy (2012)
- Under the past and current contracts
  - GPA is responsible for operational control of the Island Wide Power System (which includes Navy and GPA generation resources)
  - The Navy is a transmission / wholesale customer of the Authority
  - GPA responsible for providing military energy needs
  - Renewed agreement provides provisions to explore distribution services
- Consistent with past military expansion, military funds grid capital projects related to future build-up
- New Marine base infrastructure In Service
  - **GPA PREPARING TO SERVE A MORE THAN DOUBLING MILITARY ENERGY NEED OVER NEXT TEN YEARS**



Transmission & Distribution System

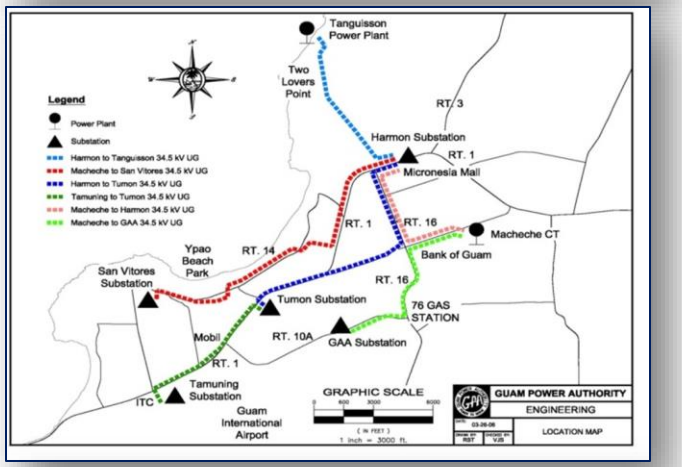
GPA manages an island-wide and resilient power delivery system

GPA's Power Delivery System Includes

- 30 substations connected through 189 miles of transmission lines
- Substations supply 67 distribution feeders with 1,650 miles of distribution lines
- GPA's delivery system is managed through the Power System Control Center and SCADA at its state-of-the-art Facility

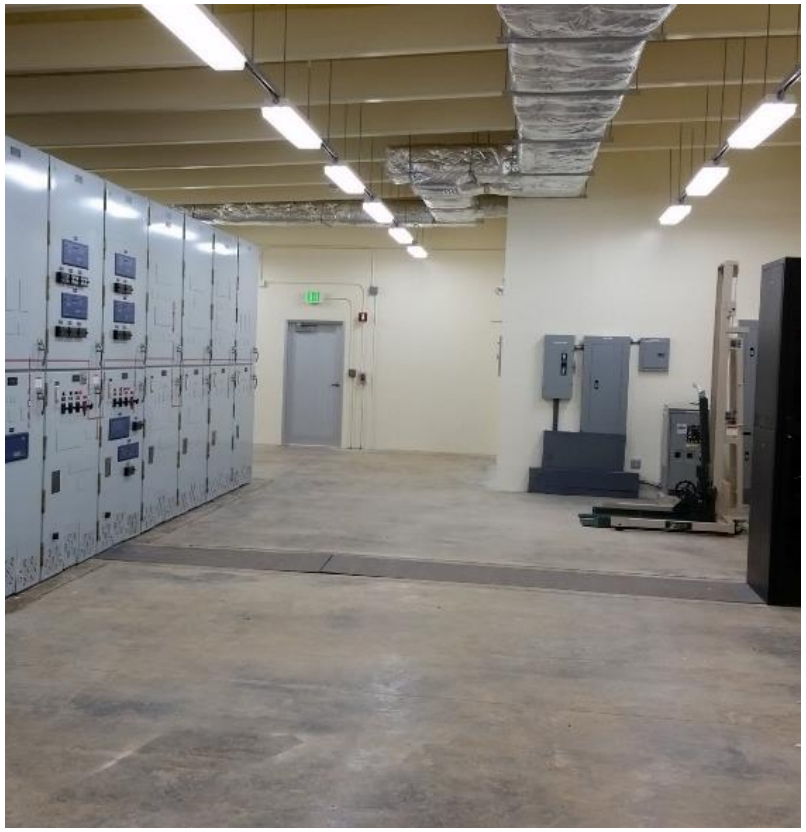
System Resilience and Efficiency

- Over 98% of Guam's power line poles are steel or concrete
- Smart grid technology
  - AMI meters for all customers in its system
  - The technology includes substation automation & broadband communication
  - Complete GPA Fiber Optic network (60% Completed)
- Focused on placing vital power transmission and distribution lines underground
- Focused on Constructing Indoor Substation
- Maintains significant inventory of essential materials, parts and equipment
- Continued apprenticeship programs in T&D and other critical trades
- Continued Integration of Energy Storage Systems



Hardened T&D Lines

Mono-Tubes and Spun Concrete Poles
170MPH Sustained Wind Rating



Indoor Substations

Assets Critical for Quick Restorations
Goal: 40 Aerial Lift Fleet minimum

System Stability Maintained by BESS

Underfrequency load shedding (UFLS) and high production cost during peak time to be mitigated by Battery Energy Storage Systems (BESS)

Hagåtña

- Spinning Reserve BESS
- 24MW/6MWh nominal guaranteed capacity after 20 yrs
- Addresses intermittency 2,700+ roof top solar units totaling about 37 MW and loss of baseload conventional generator

Talo'fo'fo

- 16MW/4MWH Firming & Shaping BESS
- Addresses intermittency from 25MW Dandan solar PV farm
- Shifts 16MWH energy over 4 hours during peak

Completed

Phase IV Bids

- 1st Dispatchable Solar PV Power Plant
- Aggregate of 330 MW SOLAR PV & SHIFTING BESS
- About $0.179/kWh estimated price
- **KEPCO 132MW / 67MW/260MWH ESS Awarded Feb 2025**
- **Commissioning by Feb 2028**

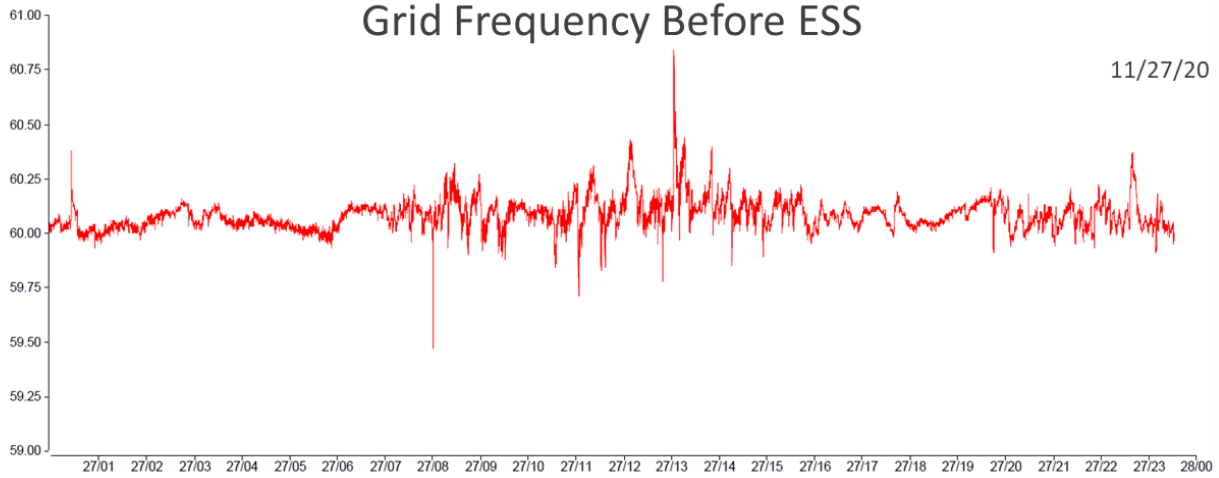
Procurement Process

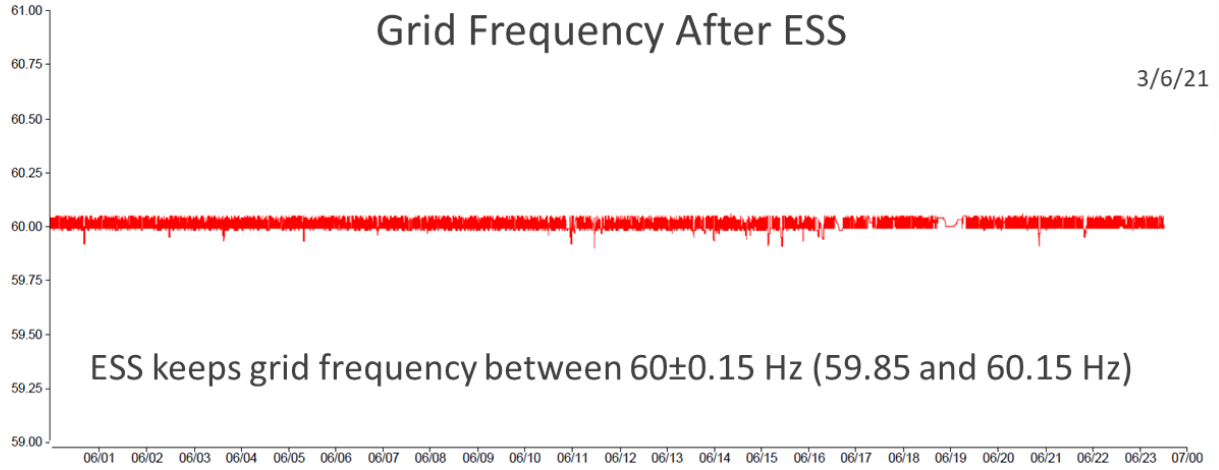
FORWARD-LOOKING

- All future GPA utility-scale solar PV PPAs must include energy shifting BESS
- GPA in pursuit of centralized BESS to contract lower cost Solar
- Together, BESS will share in frequency regulation and spinning reserve

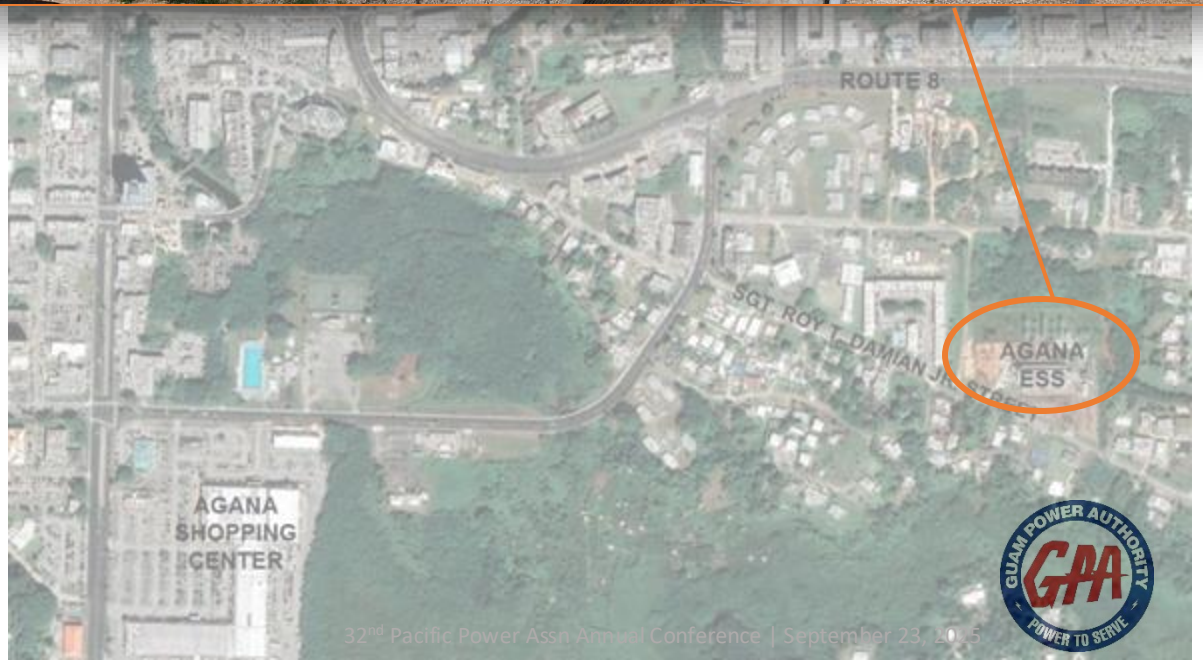
Future

Frequency Regulation: 24MW Hagåtña BESS

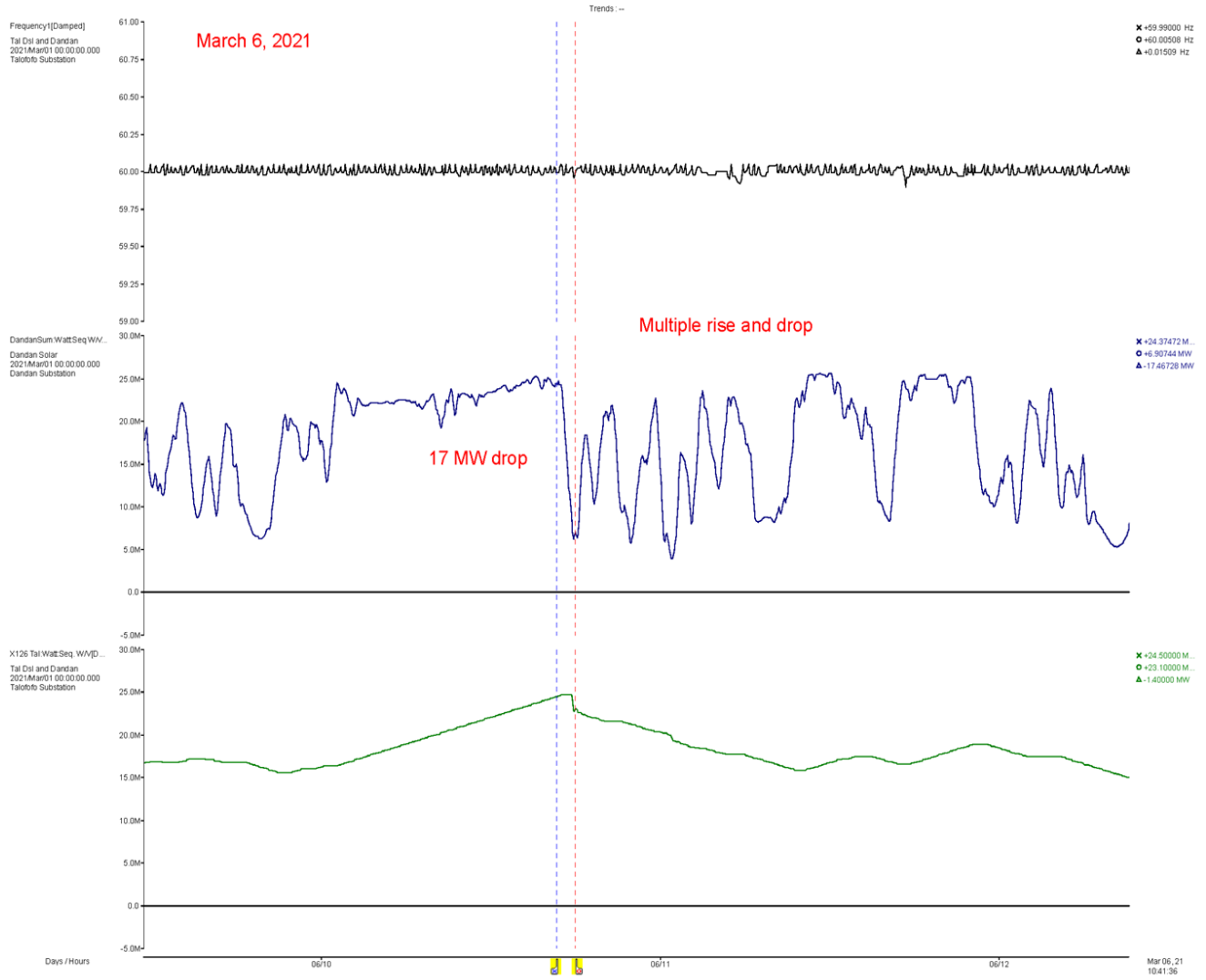




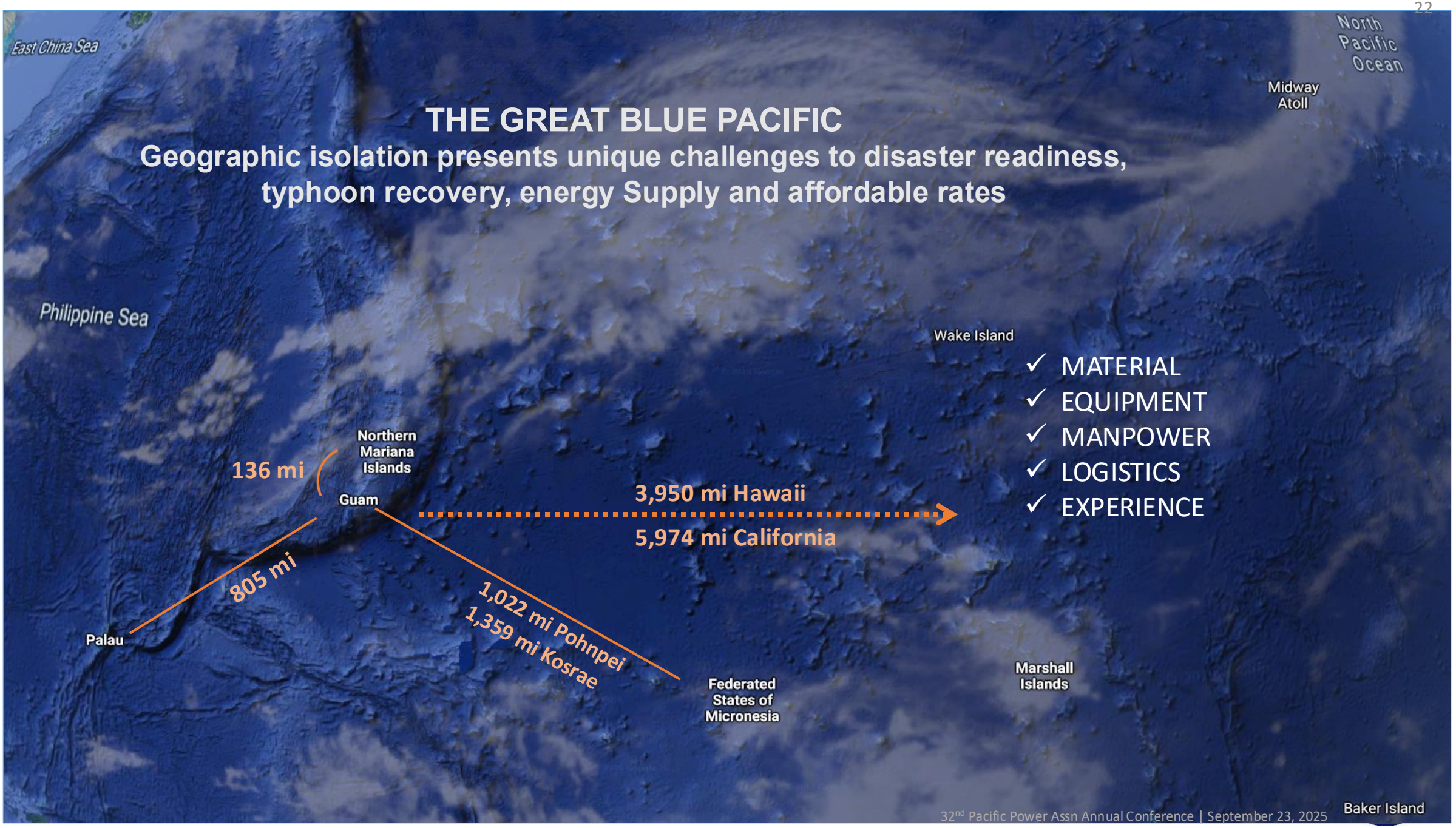
ESS keeps grid frequency between 60±0.15 Hz (59.85 and 60.15 Hz)



Frequency Regulation: 16MW ESS Talo'fo'fo BESS



Challenges & Threats



THE GREAT BLUE PACIFIC

Geographic isolation presents unique challenges to disaster readiness, typhoon recovery, energy Supply and affordable rates

- ✓ MATERIAL
- ✓ EQUIPMENT
- ✓ MANPOWER
- ✓ LOGISTICS
- ✓ EXPERIENCE

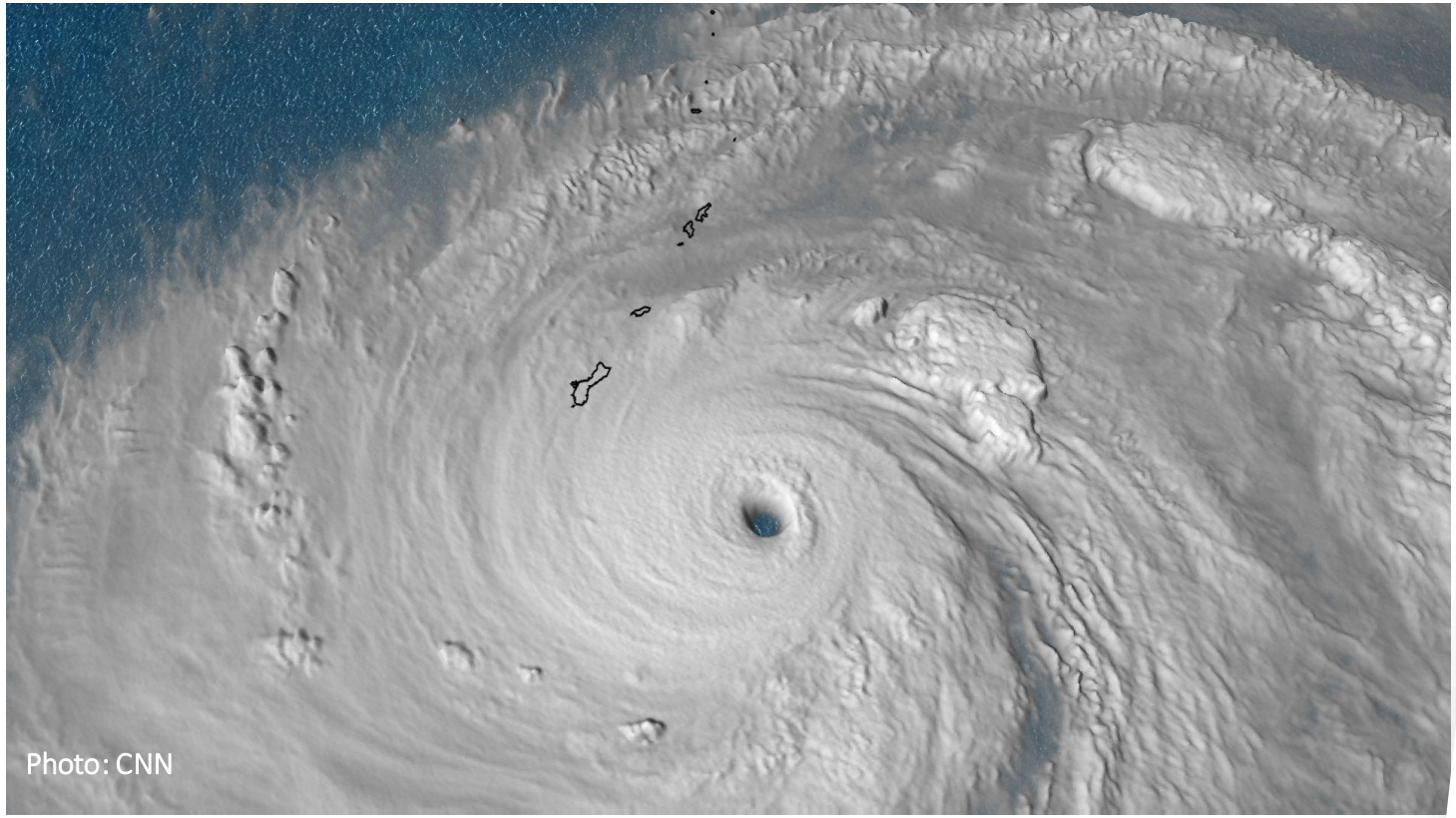


Photo: CNN

The New York Times

North Korea Missile Test Hints at Greater Menace to U.S. Bases

The test, analysts said, may have involved a new intermediate-range hypersonic missile that is faster to launch and more difficult to intercept.

The New York Times

Chinese Malware Hits Systems on Guam. Is Taiwan the Real Target?

The code, which Microsoft said was installed by a Chinese government hacking group, set off alarms because Guam would be a centerpiece of any U.S. military response to a move against Taiwan.

Share free access

Research Threat intelligence Microsoft Defender Threat actors

10 min read

Volt Typhoon targets US critical infrastructure with living-off-the-land techniques

By Microsoft Threat Intelligence

Cybersecurity Focused

GPA and Guam Waterworks Authority (GWA) are focused on cybersecurity

- To mitigate the risk of business operations impact and damage from cybersecurity incidents or cyber-attacks, GPA invests in cybersecurity and operational safeguards, including training and awareness programs and phishing simulations and has an in-house cybersecurity team that detects and responds to cybersecurity threats
- The Authority and GWA have jointly initiated cybersecurity policies and protocols and conducted system testing and assessment to identify necessary security improvements
- GPA works closely with the Guam Homeland Security, Federal Cybersecurity & Infrastructure Security Agency (CISA), Department of Defense (DOD) CIS division, and the Department of Energy (DOE). This increases our awareness in the Cybersecurity sector
- GPA and the Department of Energy (DOE) joined the Cybersecurity Risk Information Sharing Program (CRISP). This included implementing network monitoring and data gathering analytics on the Authority's business and operational network. Network activity is monitored for network anomalies, malware, suspicious traffic, and intrusion activity, and notifications are sent to our Security Operations team
- GPA and GWA have an ongoing project for Physical Security, which includes building security and access controls for the Authority's remote sites with IT assets. Cybersecurity has been closely linked with Physical Security for the protection of its business and operational networks

GPA has experienced no cyber attacks that have had a material impact on its operations or finances

- GPA and GWA have done Network Security and Vulnerability Assessments. We continue to strengthen our cyber security team thru training and team participation in national and local workshops and by adding more technical expertise into our workforce

Human Resource Challenges

Current Market Assessment:

- **GPA's competitive market position had eroded. The CCU has authorized an annual compensation migration and to be at 50% market percentile by 2028.**

Current Contributing Factors:

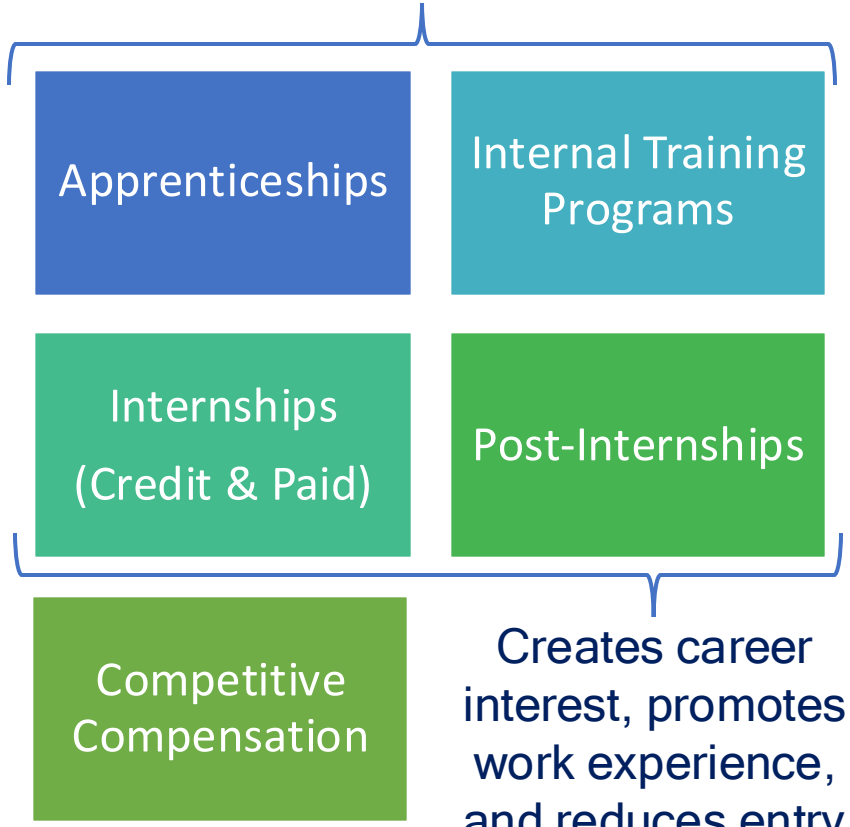
- High retirement eligibility (30-40% of workforce inevitably will retire) through 2030
- Attrition due to external competitive compensation

Recurring Contributing Factors:

- Structural migration every 4-6 years was insufficient to meet 50th percentile goal (CCU Resolution 01-FY2008)
- Market continues to trend upwards
- Market offerings of benefit package options & flexibility (i.e. COLA, retirement & insurance options, higher incremental adjustments)

Current Solutions:

Addresses applicant void by creating potential skilled, experienced applicant pool



Paradigm Shift of Our Energy Supply

Our Business | Challenges & Threats | Paradigm Shift of Our Energy Supply | Grid Infrastructure: Reliability & Resiliency | Key Support Services

Next Generation Sources

Mix of Traditional & Renewable Energy Sources

Next Generation Traditional Energy

Ukudu 51% Thermal Efficiency Combined Cycle Power Plant
Dual Fuel Capability (ULSD and Natural Gas)

Next Generation Renewable Energy

Phase IV Renewable Energy Contracts

Fuel Conversion Journey

Compliance with USEPA 2023 Ambient Air Standards

Conversion to Clean Fuel

	↓Cost ↓Env'l Impact	↑Cost ↓Env'l Impact	↑Cost ↓Env'l Impact
RFO Orders Decrease	**Lower-Cost Renewable Energy Supply Increase**	**ULSD Orders Increase**	**ULSRFO Orders Increase**
Last Deliveries: Apr 2022 HSRFO Jun 2022 LSRFO	Jun 2022 Mangilao Solar Online	Jul 2022 ULSD Piti 8 Sep 2022 ULSD Piti 9	Nov 2022 ULSRFO Cabras 1 & 2

Ukudu Power Plant will use 930,000 barrels *less* ULSD annually to produce the same amount of energy compared against the current conventional units. All conventional units use ULSD

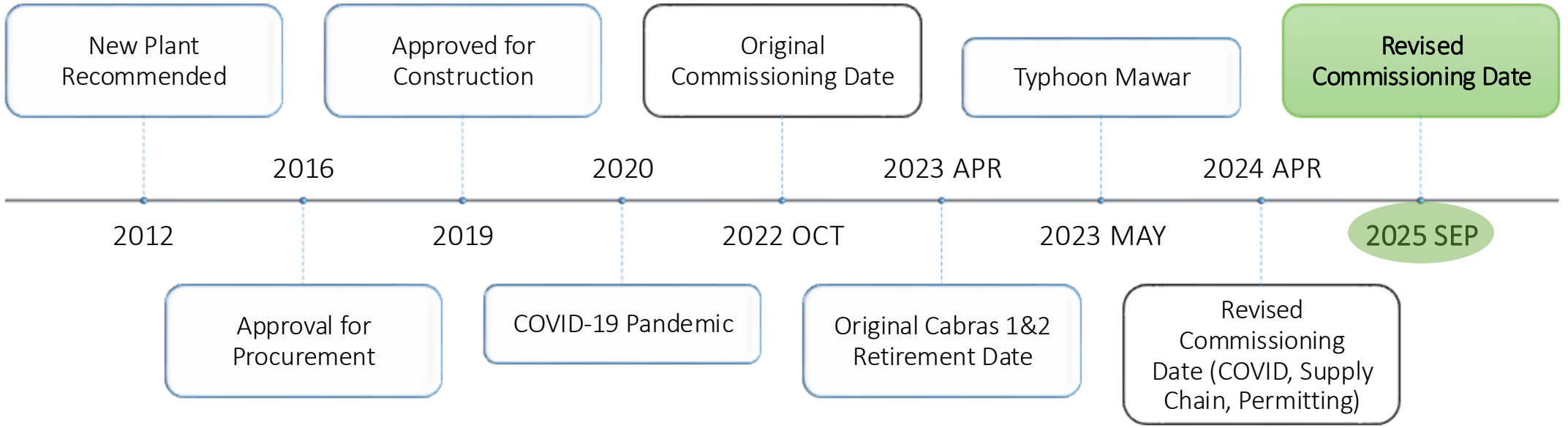
Next Steps

- Adding more Utility-Scale Renewable Energy units with energy shifting batteries will reduce annual fuel oil imports
- Seek additional Fuel Diversification
- Draft update of 2013 Liquefied Natural Gas Feasibility Study recently completed
- LNG could drop annual fuel cost an additional $35M and Ukudu Contract O&M cost $11M annually, depending on market
- Follows Guidance laid out in 2013 IRP Implementation Strategy Decisions document submitted to and accepted by the Guam PUC

Long-Term Generation Capacity Nears Completion

Ukudu Power Plant

- This plant, nearing construction completion and scheduled for commissioning in September 2025, encountered several delays due to COVID-19 and damages sustained from Typhoon Mawar.
- These delays present additional challenges for GPA to meet the demand.
- The new plant will provide improved generation reliability and substantially reduce fuel operating costs once commissioned.
- The plant is a critical part of the USEPA-GPA Consent Decree which also requires the retirement of Cabras units 1&2 within 6 months of the Ukudu plant's commissioning.



Next Generation Sources

New Conventional Power Generation

Ukudu Power Plant
198 MW Combined Cycle
Cornerstone for Renewables

Commissioning by September 2025

Dual Fuel
Ultra-Low Sulfur Diesel and Liquefied Natural Gas

51% Thermal Efficiency
GPA's most efficient conventional plant

Decreases fuel oil imports by 930,000 barrels per year

No thermal discharge to the ocean
Utilizes treated wastewater for boiler and condenser cooling

Highly Reliable
Includes 25MW Energy Storage Battery

Independent Power Producer *25-year Contract with Guam Ukudu Power*

Ukudu Power Plant: Testing & Commissioning

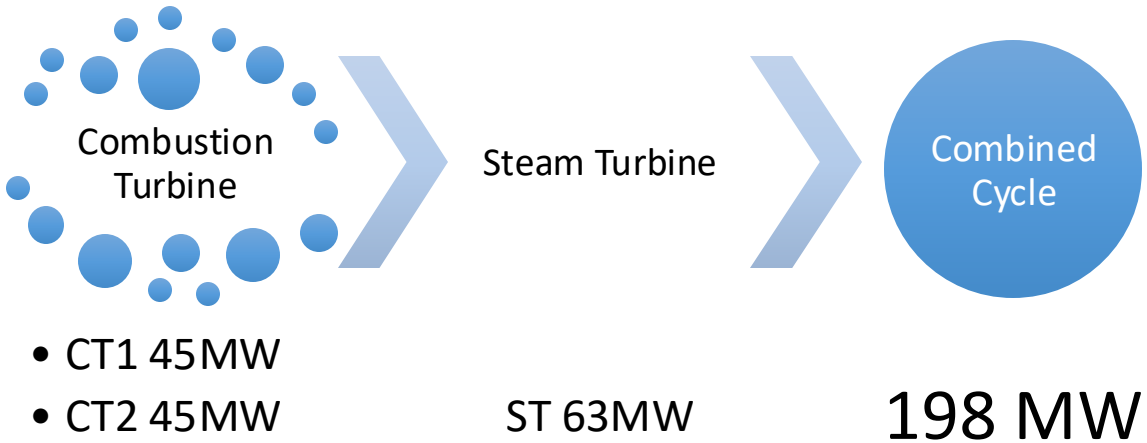
CT Load
- 3ea 45MW combustion turbines
- Test to Full Load at 135 MW

Steam Generation
- 3ea Heat Recovery Steam Generators (HRSG)
- Test to ensure adequate steam production

Steam Turbine/ Generator
- Introduce HRSG-generated steam to power Steam Turbine
- Test to Full Load at 63 MW

Combined Cycle Feed-In
- Test full Combined Cycle
- 198 MW total operating capacity
- Feed into grid
- Test to ensure contractual 51.3% thermal efficiency

BESS
- 1ea 25MW / 30mins. Energy Storage Battery
- Test to ensure stable power supply



COMMISSIONING TARGET DATE:
By SEPTEMBER 30, 2025
Contingent on satisfactory functionality of entire plant capacity and auxiliaries

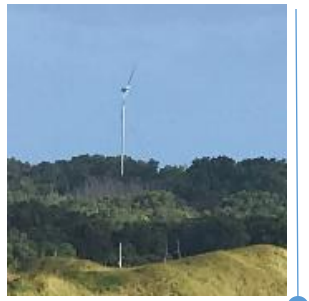
GPA Journey to 100% Renewable Energy

2015

Dandan Solar 25 MW
Ph I

2016

Wind 275 kW



2021

KMS (Mangilao) Solar 60 MW
+ BESS 32 MW – *Ph II*

2022

KES (Yoña) Solar 132 MW
+ BESS 67 MW – *Ph IV*

132 MW Solar PV with 67MW / 260MWH ESS

Contract awarded February 28, 2025

2025

An additional 120 MW of Phase IV awards under consideration in 2025

Phase IV

2028

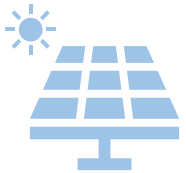
90 MW Centralized Energy Storage System

ESS

Hagåtña 24 MW
Energy Storage Batteries

Talofofo BESS 16 MW
Frequency Regulation

Phase IV Renewable Energy Projects



KES Yoña (KEPCO) — *132 MW Solar Farm + 67 MW/4-hr Energy Storage Battery*

- Contract executed on February 28, 2025.
- Commercial Operation Date: February 28, 2028.
- Reduces Annual Fuel Oil Imports by 300,000 Bbl./Year
- Increases Guam Renewable Portfolio to 30% in 2028

PRU (PEC & LMS) — *18 MW (total) + 9 MW/36-hr Energy Storage Battery*

- Contract award review at PUC for August 2025 approval.

Core Tech — *60 MW Solar Farm + 30 MW/4-hr Energy Storage Battery*

- Contractual negotiations ongoing (potential award October 2025)

Mojave Marianas — *60 MW Solar Farm + 67 MW/4-hr Energy Storage Battery*

- System interconnection discussions ongoing.

Power Solutions — *60 MW Solar Farm + 30 MW/4-hr Energy Storage Battery*

- Contract negotiations pending completion of Distribution System Impact Study (DSIS).

Projected Customer Billing With & Without Ph IV

ULSD $120 / BARREL	CURRENT BILL	WITH UKUDU	NO PHASE IV	WITH PHASE IV RENEWABLES	VARIANCE
Calculated at 1,000 kWh/mo. usage	2024	2026	2029	2029	2029
SCHEDULE R	$359.52	$260.35	$264.45	$266.55	$2.10
SCHEDULE G (Single Phase)	$1,927.92	$1,456.85	$1,477.35	$1,509.35	$32.00
SCHEDULE G (Three Phase)	$1,928.87	$1,457.98	$1,478.48	$1,510.48	$32.00
SCHEDULE J (Single Phase)	$8,847.00	$6,333.09	$6,435.59	$6,595.59	$160.00
SCHEDULE J (Three Phase)	$40,603.31	$28,643.86	$29,124.38	$29,874.46	$750.08
SCHEDULE P	$40,238.91	$30,913.62	$31,329.36	$31,978.32	$648.96
SCHEDULE L	$234,678.28	$172,955.18	$175,555.40	$179,614.28	$4,058.88

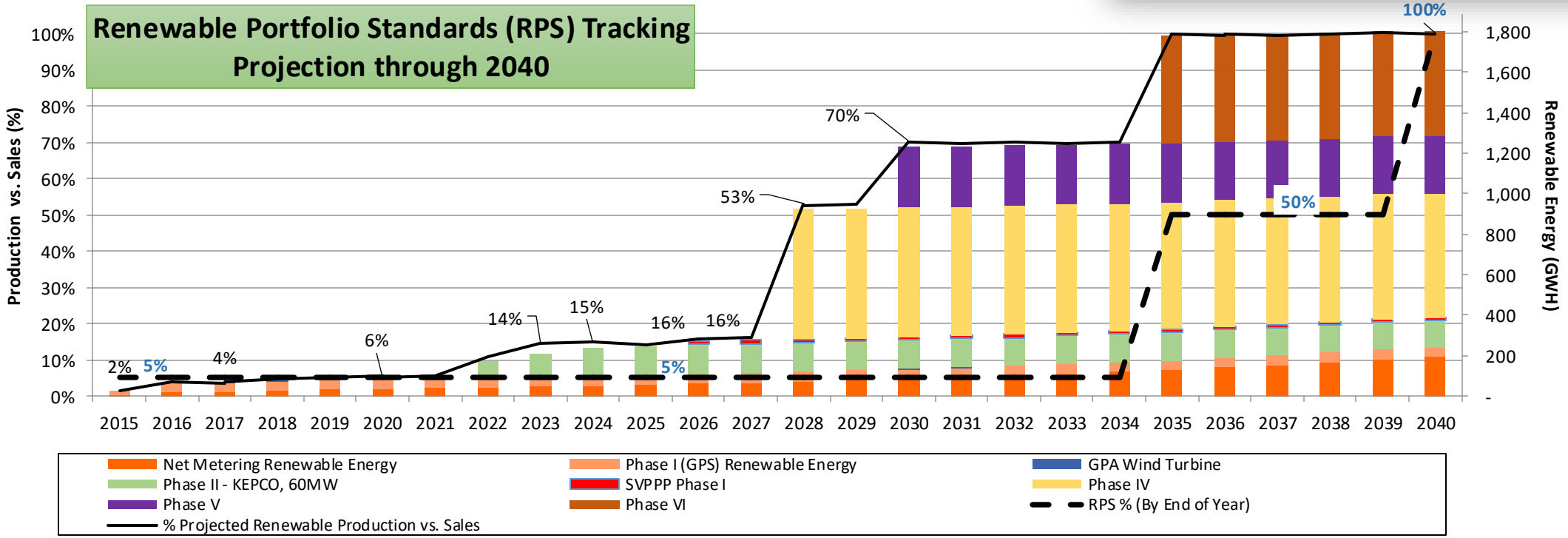
ULSD $150 / BARREL	CURRENT BILL	WITH UKUDU	NO PHASE IV	WITH PHASE IV RENEWABLES	VARIANCE
Calculated at 1,000 kWh/mo. usage	2024	2026	2029	2029	2029
SCHEDULE R	$359.52	$291.15	$296.75	$282.75	($14.00)
SCHEDULE G (Single Phase)	$1,927.72	$1,610.85	$1,638.85	$1,590.35	($48.50)
SCHEDULE G (Three Phase)	$1,928.87	$1,611.98	$1,639.98	$1,591.48	($48.50)
SCHEDULE J (Single Phase)	$8,847.00	$7,103.09	$7,243.09	$7,000.59	($242.50)
SCHEDULE J (Three Phase)	$40,603.31	$32,253.62	$32,909.94	$31,773.10	($1,136.84)
SCHEDULE P	$40,238.91	$34,036.74	$34,604.58	$33,621.00	($983.58)
SCHEDULE L	$234,678.28	$192,488.54	$196,040.06	$189,888.32	($6,151.74)

Next Generation Sources

Mix of Traditional & Renewable Energy Sources

Next Generation Traditional Energy

Next Generation Renewable Energy

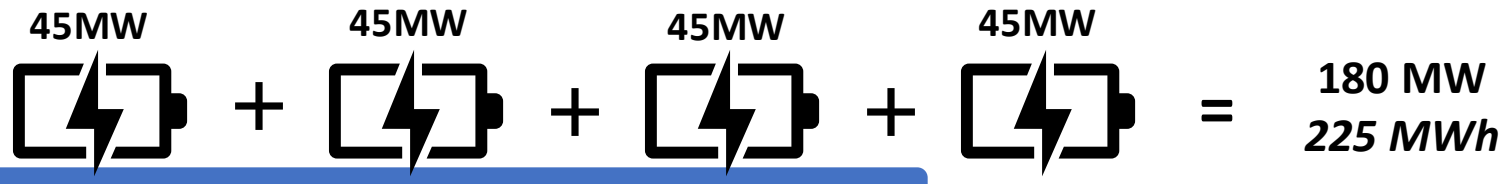


Energy Generation Capacity, Storage & Shifting Program

Unit = MW	2025		2026		2028
Date	15-May	30-Sep	15-Mar	15-Jul	Jul
EVENT	Current	Ukudu Power Plant COD	Cabras 1 & 2 Decommissioned	Aggreko Temp Diesels End	KES Yona Solar PV + ESS
BASELOAD UNITS					
Cabras 1 & 2	85	85	-	-	-
Piti 8 & 9	86	86	86	86	86
Ukudu Combined Cycle	-	198	198	198	198
Piti 7 CT	20	20	33	33	33
Dededo 1 & 2 CT	32	32	40	40	40
Yigo CT	19	19	20	20	20
Macheche CT	20	20	20	20	20
Tenjo Diesels	12	12	12	20	20
Talofofo Diesels	8	8	8	8	8
Pulantat Diesels	4	4	8	8	8
TEMPORARY POWER CAPACITY					
Aggreko	20	20	20	-	-
SOLAR PV DAYTIME CAPACITY					
KEPCO Mangilao Solar	60	60	60	60	60
GlidePath	25	25	25	25	25
KES Yona	-	-	-	-	132
ENERGY STORAGE BATTERY SHIFTING					
Talofofo ESS	4	4	4	4	4
KEPCO-Samsung ESS	-	-	-	-	67
GPA Centralized ESS*	-	-	-	-	90
Total Capacity Available	**310**	**508**	**449**	**437**	**594**
Projected Peak Demand	265	270	250	278	297
Balance for Reserve/Growth	**45**	**238**	**199**	**159**	**297**

Central ESS

Centralized ESS capacity provides significantly improved reliability for the grid



Flexibility & Cost Savings

- Adds significant flexibility by **charging directly from utility-scale renewable energy systems in daytime and from conventional generation plants during early morning low-demand periods**.
- This flexibility provides lower-cost energy (savings from dispatching at least-cost periods). Fast return-on-investment (ROI) through decreased fossil fuel demand and decreased maintenance of stand-by generation.

Reliability & Resiliency

- A centralized ESS, coupled with the new Ukudu Power Plant (dual-fired, initially with ULSD, then liquefied natural gas) and several utility-scale solar facilities (totaling 180+ MW) **significantly improves energy reliability and resiliency, and reduces the cost-impact triggered by world events.**
- Resiliency and reliability substantially improved because the **network of existing underground 34.5 KV transmission system and several overhead systems all connected to about 120 MW of reserve units in the north**.
- Adding an underground transmission line between Dededo Substation to Harmon Substation completes a complete underground transmission system in the north.

Potential Location(s)

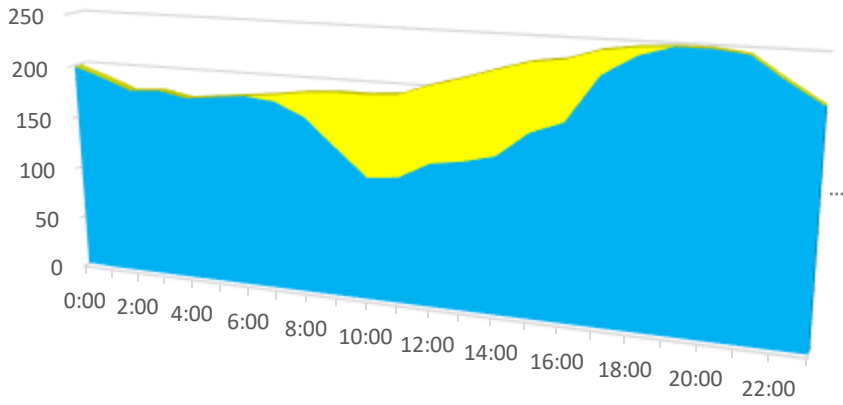
- 90 MW on GPA-owned and -controlled lot, adjacent to the new Ukudu Power Plant site, providing feed-in to existing Harmon substation and opportunity to serve major load centers in north through existing underground infrastructure.
- 1st preference is 115KV /34.5KV TIE-IN
- One 45 MW/225MWH at AAFB Substation site (transmission side) which would allow charging from about 120 MW of GPA reserve units or 198 MW Ukudu Plant. This ESS can provide uninterrupted energy to AAFB for close to 24 hours.
- One 45 MW ESS unit could be in south near NBG (transmission side).
  - This ESS could supply resilient and sustainable energy to NBG, including Polaris Point

Central ESS

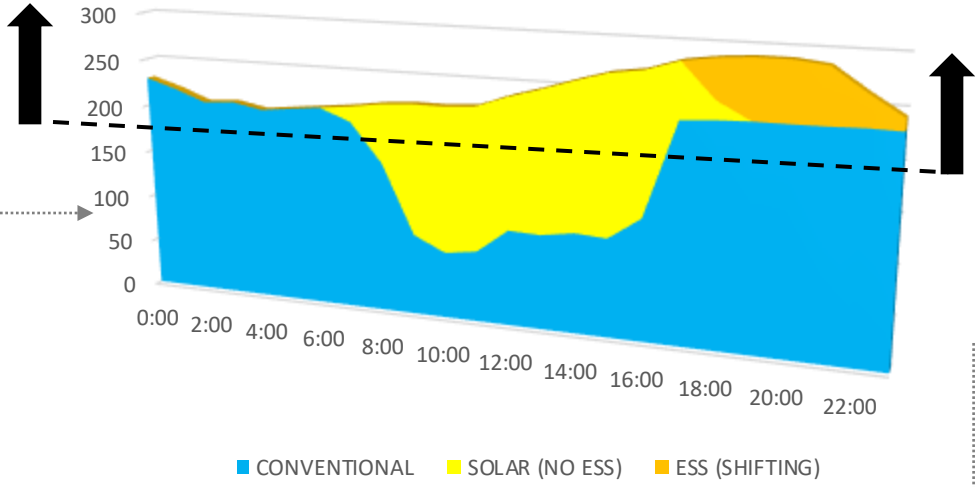
1 Significant growth in peak demand is on the horizon	Energy storage is needed for the grid now.
	ESS will provide fuel savings by offsetting more expensive generation
2 Growth rate under continuous evaluation	Additional fuel savings could be achieved by levelizing Ukudu production
	GPA continues to seek assistance from federal government for 180MW/900MWh ESS but outcome uncertain.
3 Solar duck curve must be managed effectively	ESS provides capacity which allows retirement of aged conventional units.
	ESS provides capacity for growth and for lower cost renewables power purchase agreements in future by requiring less shifting ESS.
	ESS could alleviate need for batteries from future roof top and other types of solar PV production.

Managing Growth with Dynamic Generation Sources

FY 2025 DUCK CURVE
NO SHIFTING ESS

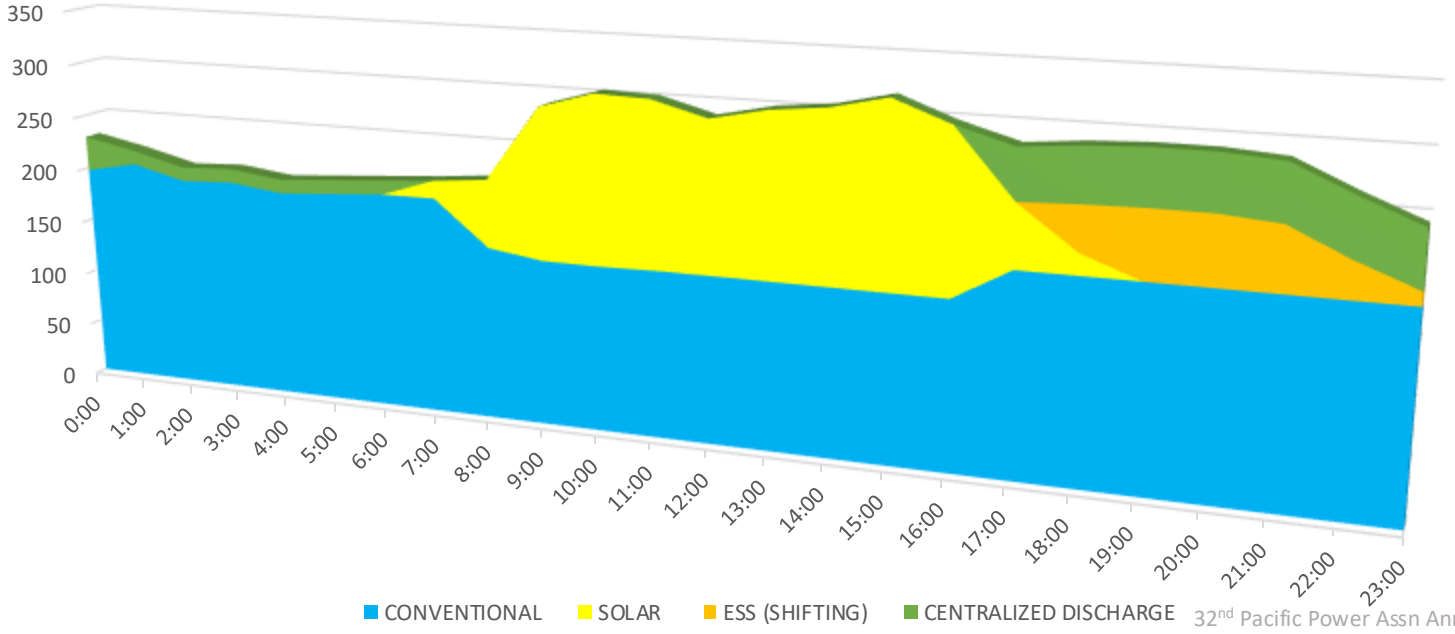


2028 DUCK CURVE
WITH KEPCO 67MW SHIFTING ESS

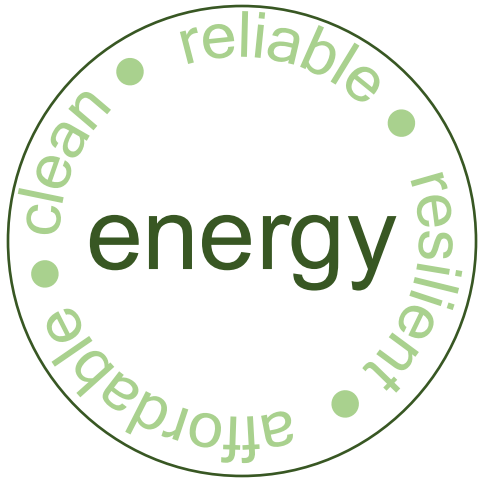


Centralized ESS is key to managing solar duck curve

2028 DUCK CURVE WITH 90 MW CENTRALIZED ESS



Goal: Sustained Clean, Reliable, Resilient, Affordable Energy



Renewables with ESS
Utility-Scale Solar
Customer Solar
Other Renewables

Utility-Scale Energy Storage Batteries
Upgrade T&D Lines

New Efficient Baseload Units
Ukudu Plant

Clean Fuel
Ultra Low-Sulfur Fuel
Explore LNG

2028 PROJECTED ACHIEVEMENTS

30%
Minimum renewable energy generation

51,600,000 barrels less imported oil*

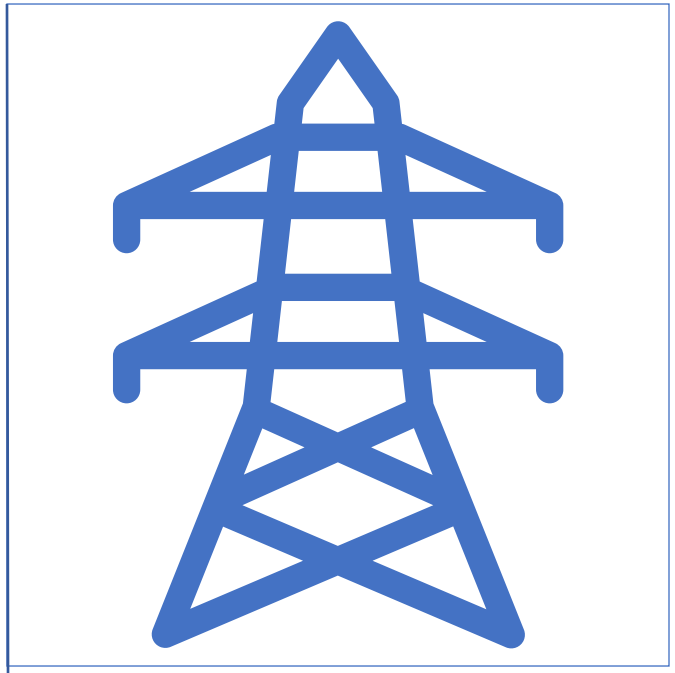
COMPLIANCE
Consent Decree
All USEPA Air Quality Standards

99% REDUCED SO2 EMISSIONS
Cleaner air

1.6 million gallons per day less wastewater outfall

LOWER STABILIZED BILLS
Est. $0.13 LEAC @ $100/bbl. gives ratepayers sustainable, affordable rates

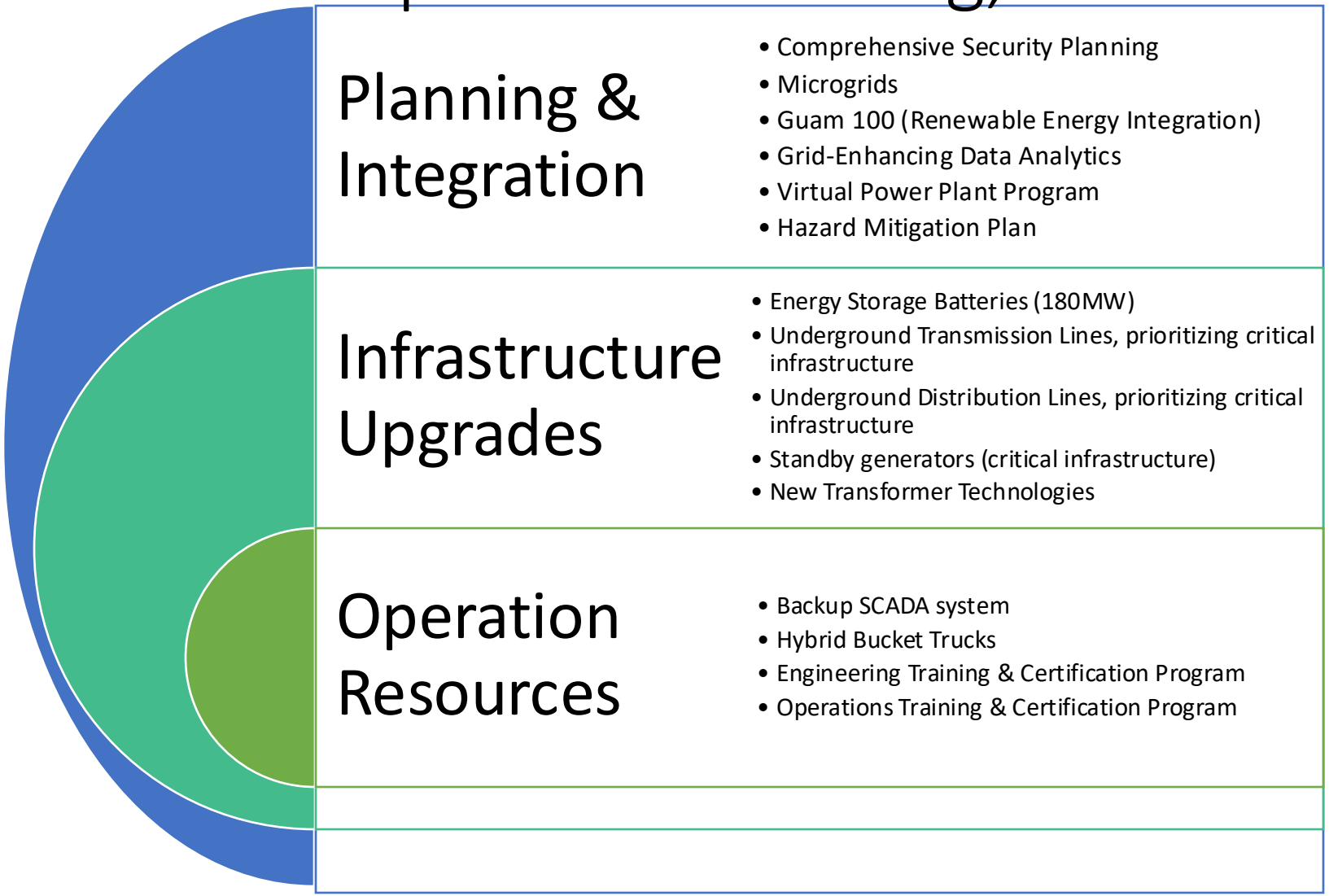
**annual basis*



Grid Infrastructure: Reliability & Resiliency

Our Business | Challenges & Threats | Paradigm Shift of Our Energy Supply | Grid Infrastructure: Reliability & Resiliency | Key Support Services

Partnerships: Grid Planning, Modernization, Resiliency



Planning & Integration

- Comprehensive Security Planning
- Microgrids
- Guam 100 (Renewable Energy Integration)
- Grid-Enhancing Data Analytics
- Virtual Power Plant Program
- Hazard Mitigation Plan

Infrastructure Upgrades

- Energy Storage Batteries (180MW)
- Underground Transmission Lines, prioritizing critical infrastructure
- Underground Distribution Lines, prioritizing critical infrastructure
- Standby generators (critical infrastructure)
- New Transformer Technologies

Operation Resources

- Backup SCADA system
- Hybrid Bucket Trucks
- Engineering Training & Certification Program
- Operations Training & Certification Program

Awards To Date: ~ $20M
Pending Proposals: ~$7B

GPA's efforts to secure grants for planning, upgrades, and resources significantly reduces the impact on ratepayers.

Federal Grant Programs
• DOE • DOI • FEMA • EPA • DOD

Partners
• University of Guam • Guam Energy Office • Guam Community College • National Labs (NREL, ANL, LBNL, PNNL) • American Public Power Association

"One Guam" Approach to Infrastructure Resiliency

One Guam

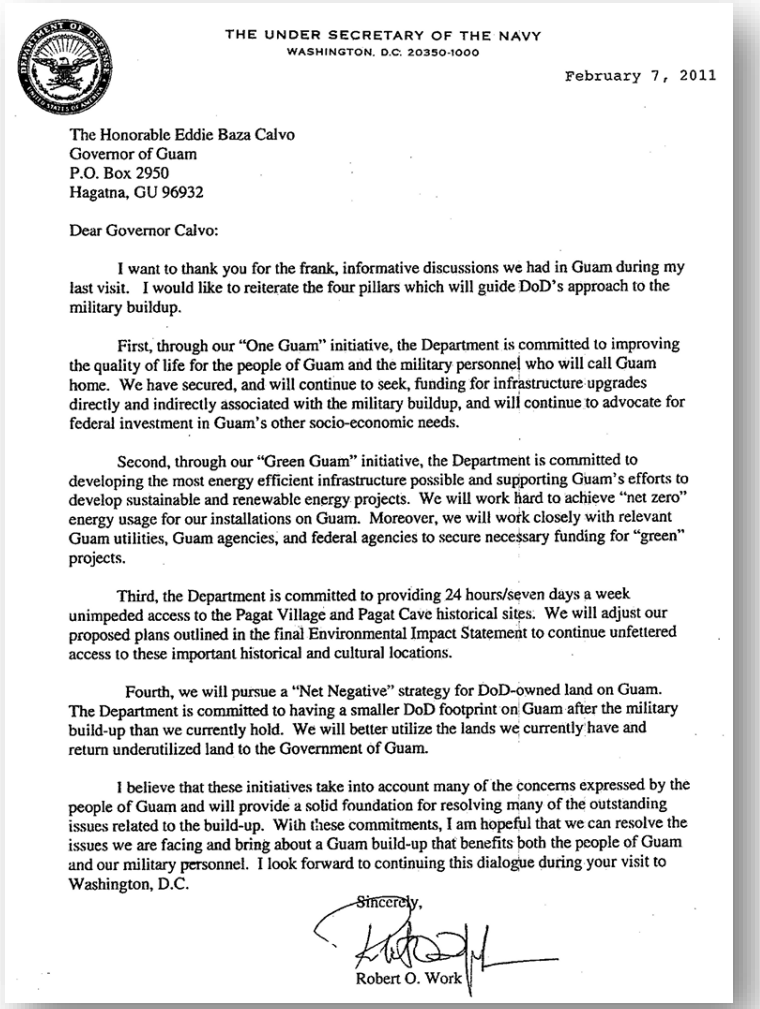
- Guam Power Authority is the sole provider of energy for the island community including the military.
- The island power grid must be ready for the conflicts facing the nation and from national disasters. Almost all critical military branches use Guam as their strategic base to defend the nation from adversaries. Billions of dollars have been spent in building up the bases in Guam including providing high tech missile defense systems.
- **It is crucial that the federal government and the local community work together to mitigate Guam's vulnerability to natural and man-made disasters (including cyber attacks), and military conflicts.**
- **Any and all efforts to increase energy capacity and resilience must follow the One Guam approach.**

Increased Natural & Bad Actor Threats

- The national defense environment have changed substantially over the past two decades. Threats from China and North Korea have substantially increased; Guam's strategic importance requires our infrastructure to be resilient for potential conflict with unfriendly nations. Climate and weather events have increased in magnitude and frequency.

One Guam Power Infrastructure Resiliency Plan

- **GPA has detailed a mitigation plan for its infrastructure to provide resiliency from all the threats, natural or otherwise. These critical investments will bolster utility (power, water and wastewater) resiliency.**
- GPA's ability to obtain funding for the billions in investments needed is doubtful. If GPA were able to secure funding, it will certainly double power rates, if not more, making island energy costs unaffordable.
- The investment of the federal government into Guam's infrastructure will provide returns over the decades to come.



THE UNDER SECRETARY OF THE NAVY
WASHINGTON, D.C. 20350-1000

February 7, 2011

The Honorable Eddie Baza Calvo
Governor of Guam
P.O. Box 2950
Hagatna, GU 96932

Dear Governor Calvo:

I want to thank you for the frank, informative discussions we had in Guam during my last visit. I would like to reiterate the four pillars which will guide DoD's approach to the military buildup.

First, through our "One Guam" initiative, the Department is committed to improving the quality of life for the people of Guam and the military personnel who will call Guam home. We have secured, and will continue to seek, funding for infrastructure upgrades directly and indirectly associated with the military buildup, and will continue to advocate for federal investment in Guam's other socio-economic needs.

Second, through our "Green Guam" initiative, the Department is committed to developing the most energy efficient infrastructure possible and supporting Guam's efforts to develop sustainable and renewable energy projects. We will work hard to achieve "net zero" energy usage for our installations on Guam. Moreover, we will work closely with relevant Guam utilities, Guam agencies, and federal agencies to secure necessary funding for "green" projects.

Third, the Department is committed to providing 24 hours/seven days a week unimpeded access to the Pagat Village and Pagat Cave historical sites. We will adjust our proposed plans outlined in the final Environmental Impact Statement to continue unfettered access to these important historical and cultural locations.

Fourth, we will pursue a "Net Negative" strategy for DoD-owned land on Guam. The Department is committed to having a smaller DoD footprint on Guam after the military build-up than we currently hold. We will better utilize the lands we currently have and return underutilized land to the Government of Guam.

I believe that these initiatives take into account many of the concerns expressed by the people of Guam and will provide a solid foundation for resolving many of the outstanding issues related to the build-up. With these commitments, I am hopeful that we can resolve the issues we are facing and bring about a Guam build-up that benefits both the people of Guam and our military personnel. I look forward to continuing this dialogue during your visit to Washington, D.C.

Sincerely,

Robert O. Work

One Guam Power Resiliency Plan: Physical Infrastructure

DESCRIPTION		EST. COST ($M)
ITEM 1: Underground Transmission Lines & Indoor Substations		**$ 833**
Islandwide Power System Incl Assets Serving Military Facilities		
ITEM 2: Critical Distribution System Mitigation		**$ 813**
Underground distribution feeders for Y, D, F & M-Series water wells, treatment facilities/reservoirs, wastewater treatment plants, lift and pump stations	$ 502	
Underground of Naval Hospital feeder; communications core sites; industrial sector feeders; GDOE public schools, GCC, UOG	$ 78	
Standby generator systems including ATS/fuel storage for critical facilities such as public health, medical facilities, typhoon shelters, youth facilities, DOC, etc.	$ 95	
Hybrid underground of various villages secondary lines and to replace overhead transformers with pad mounted transformers	$ 138	
ITEM 3: Other Critical Infrastructure Resiliency Projects		**$ 730**
Energy Storage Batteries (180MW/900MWh)	$ 500	
New 80MW Combustion Turbine Capacity	$ 100	
Standby generator upgrades placed in concrete housings with adequate fuel storage capacity for water and wastewater systems	$ 30	
T&D operations center. Backup SCADA. Fiber optic system. Physical facilities. GWA SCADA and motorized valves.	$ 80	
Bucket trucks, line equipment, underground systems training	$ 20	
Subtotal - *Immediate Critical Infrastructure Resiliency Projects (Items 1-3)*:		**$ 2,376**
ITEM 4: Underground Remaining Distribution System		**$ 4,025**
Convert remaining distribution systems to fully underground system		
Total - *All Resiliency Projects*:		**$ 6,401**

*Preliminary Estimate as of July 20, 2023

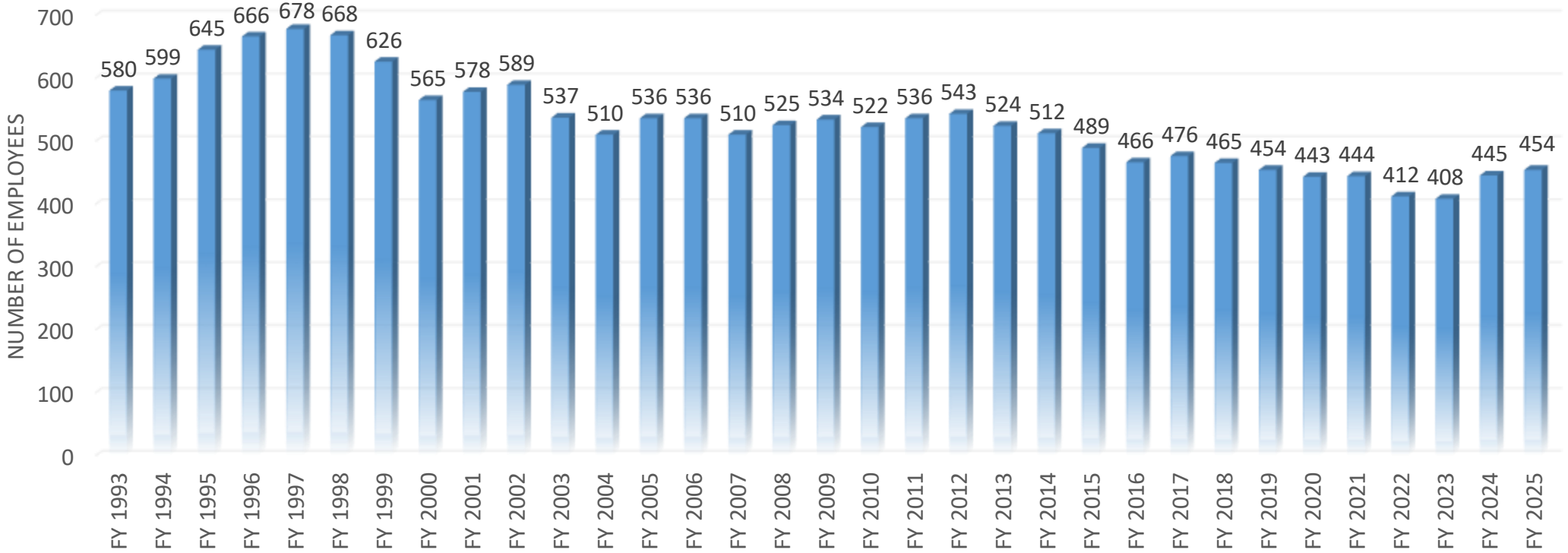
One Guam Power Resiliency Plan: Cyber Infrastructure

DESCRIPTION		EST. COST ($ 000,000)
ITEM 1: Communication Security Upgrades		**$ 19**
Secure power and water IT/OT network communication with northern, central, and southern hardened fiber rings at joint utility assets to provide resiliency through self-healing topology.	$ 15	
Implement Software Defined Networking (SDN) to improve visibility, security and management of network traffic between substations and Power System Control Center (PSCC).	$ 2	
Upgrade Supervisory Control and Data Acquisition (SCADA) system to upgrade security controls and new automation	$ 2	
ITEM 2: Other Critical Cybersecurity Infrastructure Resiliency Projects		**$ 2**
Upgrade data servers. Zero Trust Architecture to ensure verification and authorization of all IT/OT network traffic. Establish Security Operations Center (SOC) tools and management resources.	$ 2	
Total - *All Cyber Resiliency Projects*:		**$ 21**

Key Support Services

Human Resource Planning

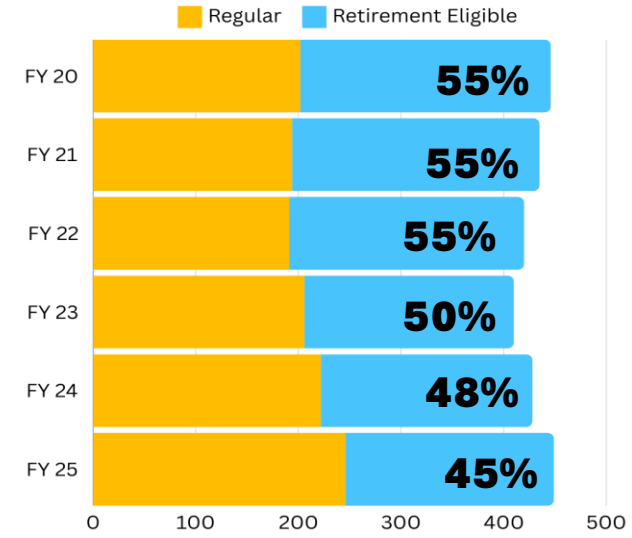
Temporary increase in total full-time employee (FTE) count addresses succession planning and high retirement eligibility rates



RECRUITMENT ANALYSIS

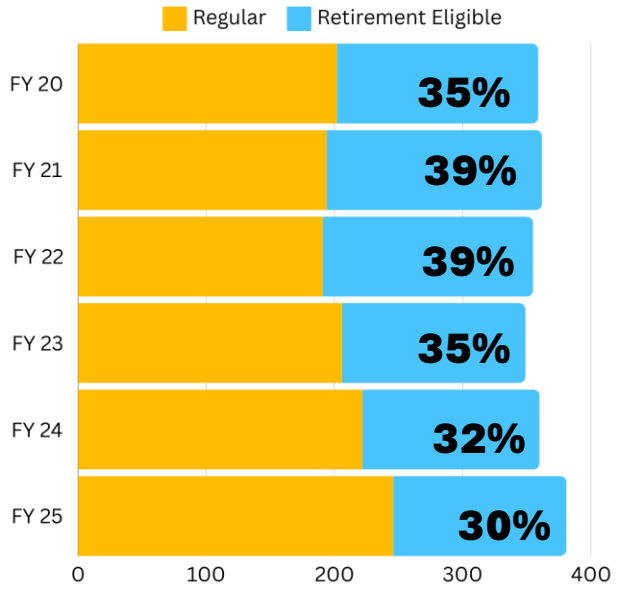
Fiscal Year	Promotions	New Hires	Resignations	Retirement	Deaths	Promotion/ Reclassifi-cation	Terminations	Total Author-ized FTE	Attrition Rate	Total Filled FTE at end of Fiscal Year	Percentage of Filled FTE at end of Fiscal Year
2024	32	57	12	13	0	3	0	490	6.1%	442	90.2%
2025	2	13	2	1	1	2	0	490	0.9%	454	92.7%

Employee Retirement Eligibility



10-Year RETIREMENT ELIGIBILITY

	FY20	FY21	FY22	FY23	FY24	FY25
FTE Count	446	435	420	410	427	454
Average Age	48	48	48	47	47	46
Retirement Eligible	244	241	229	204	205	203
Percentage Eligible	**55%**	**55%**	**55%**	**50%**	**48%**	**45%**



5-Year RETIREMENT ELIGIBILITY

	FY20	FY21	FY22	FY23	FY24	FY25
FTE Count	446	435	420	410	427	454
Average Age	48	48	48	47	47	46
Retirement Eligible	157	168	164	143	138	135
Percentage Eligible	**35%**	**39%**	**39%**	**35%**	**32%**	**30%**

Succession Planning

Right-sizing; upgrading skill-sets; training for succession

APPRENTICE PROGRAM

Apprenticeship offered for several operational and technical positions. Class cost covered by Guam Manpower Development Fund. 2 year – 4 year programs with US DOL-certification.

- 5th Cycle: Completed Oct 2023
- 6th Cycle: Completed Oct 2024
- 7th Cycle: Started Apr 2024
- 8th Cycle: Started Oct 2024

INTERNSHIP PROGRAM

90-day for-credit or paid internships offered 3 times a year. Partnership with University of Guam.

- Engineering
- Cybersecurity
- Human Resources
- Finance
- Administration

IN-HOUSE TRAINING PROGRAM

Develops knowledge and skills required for entry-level positions requiring minimum power utility experience.

- 1st Cycle: Completed
- 2nd Cycle: Recruitment planned

Disaster Preparedness

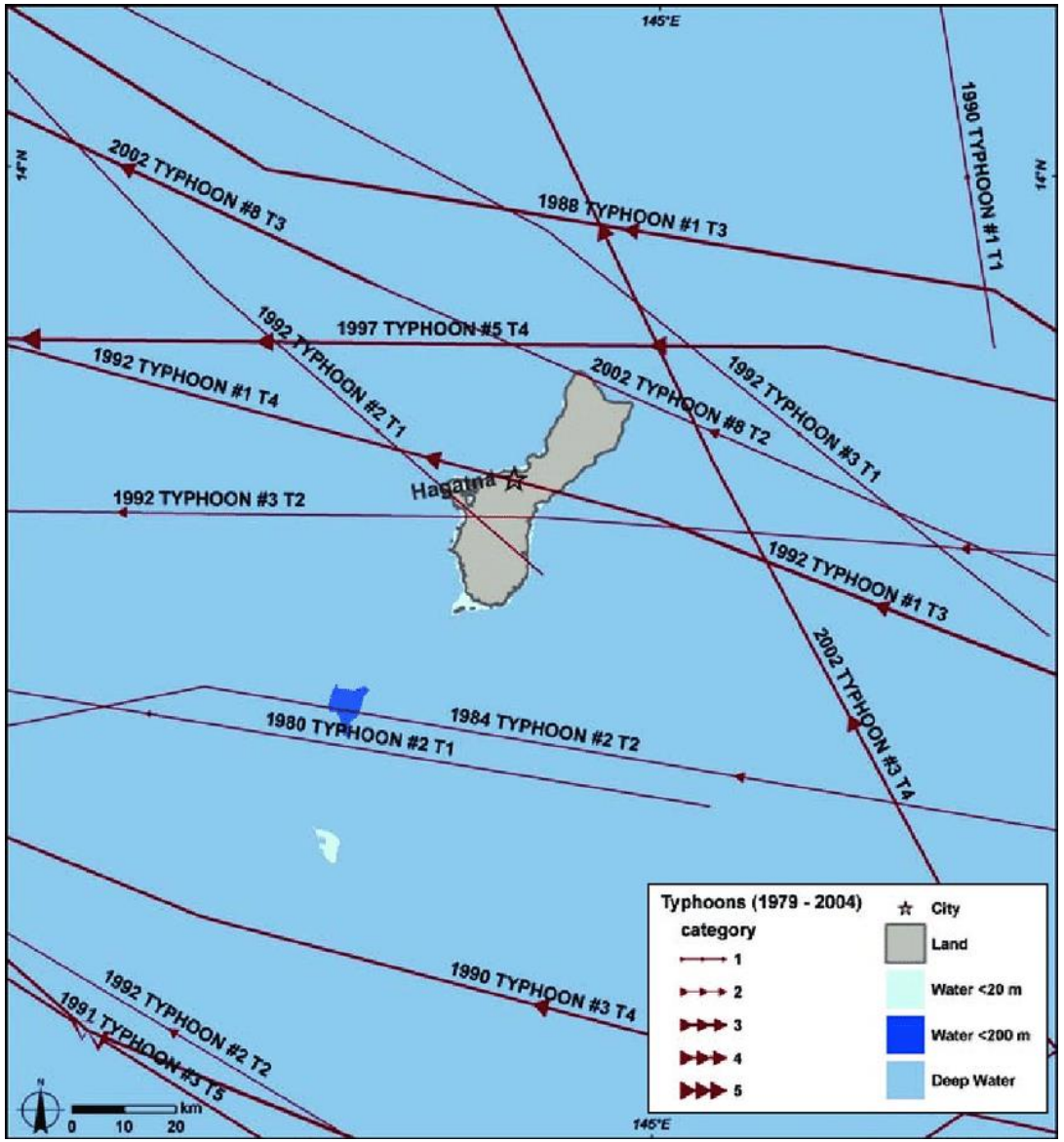
MATERIAL
- $20M Self Insurance Fund
- $15M+ Inventory
- 5,012 Line Items

EQUIPMENT
- 30+ Bucket Trucks and substantial Support Equipment
- Heavy Equipment – Diggers, Cranes, etc.
- Contracted Private Assets

MANPOWER
- 100+ T&D; 80 Generation
- 450 Company-wide
- Linemen through Mutual Aid

LOGISTICS
- Operational Sectors
- Lodging, Meals and Other Support Needs
- Land, Air and Sea Transport

EXPERIENCE
- Seasoned Skilled Teams
- Mutual Aid Agreements and Contacts
- FEMA Reimbursement Team



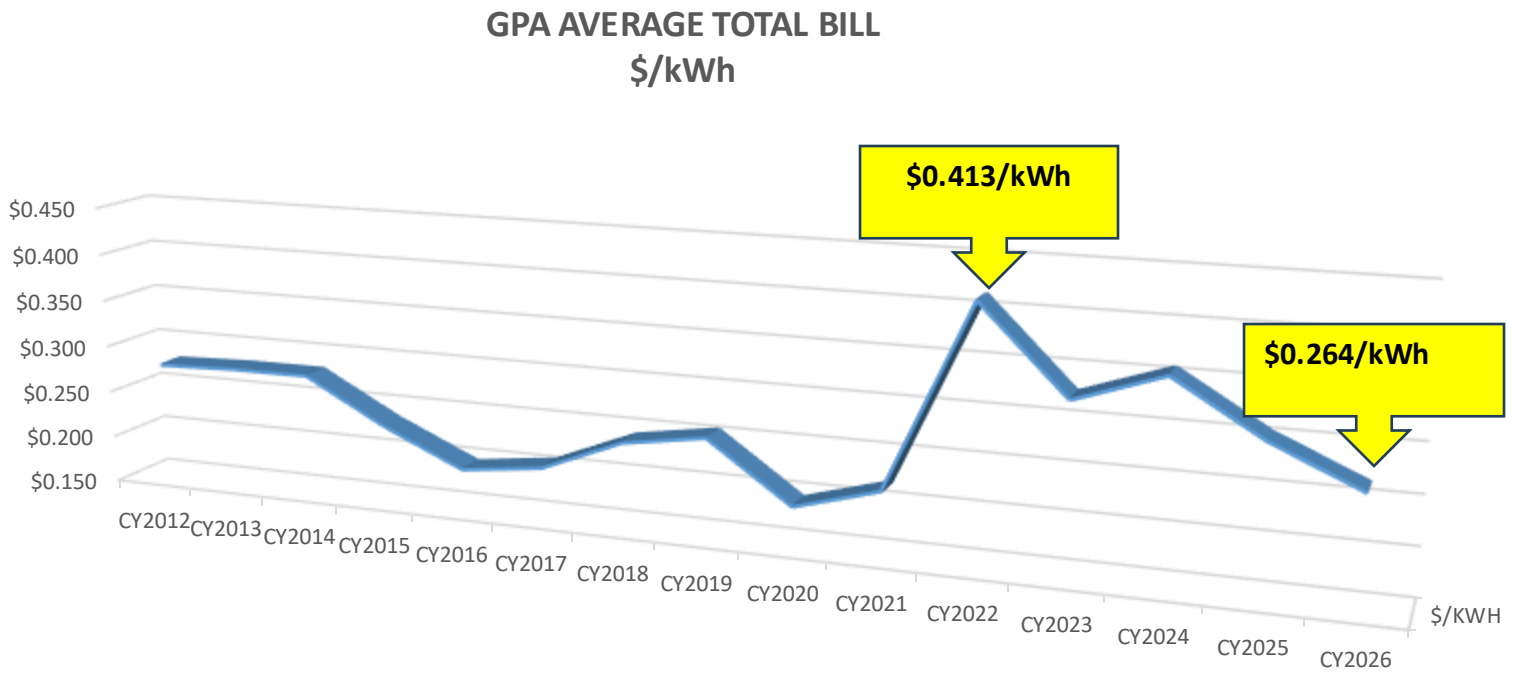
The path and intensity of typhoons passing near Guam from 1979-2004.
Map: A Shapiro. Data: UNISYS, http://weather.unisys.com/hurricane.

Summary

Our Business	Challenges & Threats	Paradigm Shift of Our Energy Supply	Grid Infrastructure: Reliability & Resiliency	Key Support Services

Reducing Oil Imports = Reduced Costs & Power Rates

CY YEAR	$/kWh
CY2012	$0.277
CY2013	$0.280
CY2014	$0.280
CY2015	$0.233
CY2016	$0.195
CY2017	$0.206
CY2018	$0.241
CY2019	$0.255
CY2020	$0.193
CY2021	$0.218
CY2022	$0.413
CY2023	$0.326
CY2024	$0.357
CY2025	$0.303
CY2026	$0.264



FUEL OIL IMPORT REDUCTION PLAN:

YEAR (CY)	FUEL CONSUMPTION	REDUCTION	% RENEWABLES	PROJECT
2022	3,000,000			
2023	2,750,000	250,000	15%	KEPCO 60MW SOLAR
2026	1,820,000	930,000	15%	UKUDU POWER PLANT
2028	1,520,000	300,000	30%	KEPCO 132MW SOLAR CONTRACT
2030	1,220,000	300,000	53%	POWER PURCHASE CONTRACTS

Short Term Goals Yield Positive Gains

CY 2026

Provide Affordable Energy at ~$0.26/kWh

- Reduce annual fuel oil imports from 3 MBbl (2022) to 1.8 MBbl.
- Retire 50-year-old base load units. These are the last units burning residual fuel oil and using ocean cooling condensers.
- All conventional generators burning clean ULSD fuel oil.
- Comply with PUC energy supply reliability criteria of 1 Day in 4.5 years
- Capable of accommodating 28MW in additional growth.
- Comply with all USEPA and GEPA air and water regulations.
- Achieve Renewable Portfolio Standard of 16%.

CY 2028

Achieve Mission of Affordable Rates on a Sustained Basis

- Reach 40% - 53% Renewable Portfolio Standard to provide a significant hedge against fuel prices
- Further reduce fuel oil imports to 1.5 MBbls and below.
- Install centralized energy storage batteries to reduce cost, add capacity, enhance resiliency.
- Increase load growth capacity to 245MW.
- Reduce base rates due to increased revenue from growth.

CY 2030

Continue Projects To Improve Reliability & Enhance Resiliency

- Contract lower cost renewable energy projects
- Retire aged conventional units to reduce costs and rates

The Reward Is Worth the Journey

GPA's journey has been long and challenging but we will achieve our energy goals this decade!

Plan To Act & Act To Plan

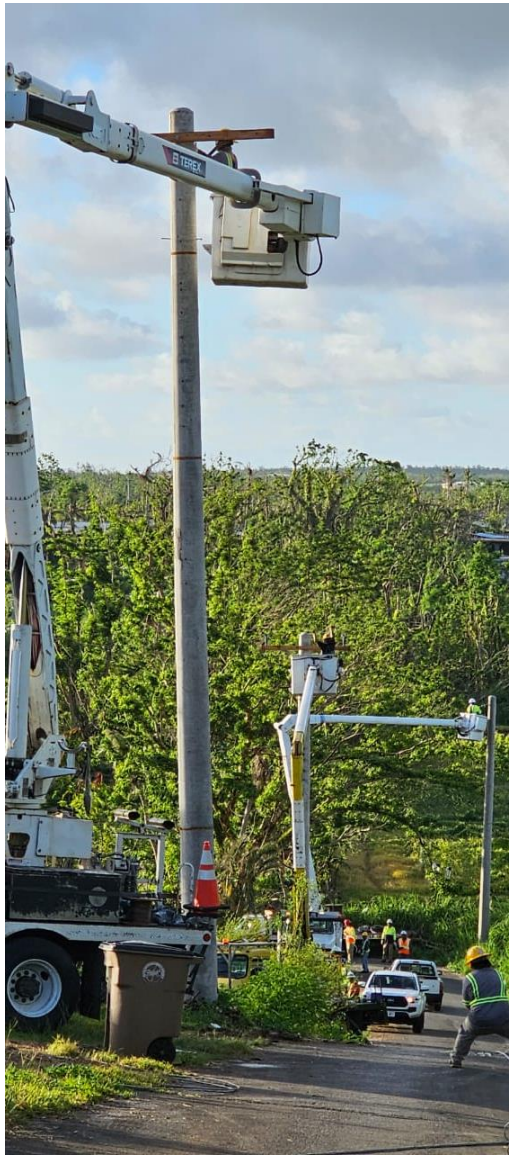
- Island grids have unique challenges because there is no support from a national grid.
- Integrated Resource Planning is critical to every power utility, especially as the industry is experiencing a paradigm shift

Leverage Partnerships

- Pacific island power utilities' issues and challenges are similar, if not identical. Avoid reinventing the wheel – **let's work together**!
- GPA's experience can help Pacific Power Association partners in achieving similar goals to integrate other capacity sources into their respective grids.
- National laboratories can assist in research and model development to ensure a reliable grid.
- Industry associations, such as PPA and the American Public Power Association, also have resources to assist its members.
- Please join GPA at its Annual Power Symposium, usually held every April on Guam. GPA shares its progress and challenges at this event.

Thank you for assisting GPA during typhoon recoveries!

GPA is grateful and extends its assistance to its PPA partners.



Si Yu'os Ma'ase'!

Mesulang!

Kammagar!

Kinisou!

Kulo!

Kalahngan!

Fa'afetai!

Kommol!