



GUAM POWER AUTHORITY
ATURIDÂT ILEKTRESEDÂT GUAHAN
P.O.BOX 2977 • AGANA, GUAM U.S.A. 96932-2977

Issues for Decision

Resolution No. 2021-01

RELATIVE TO AUTHORIZING THE GUAM POWER AUTHORITY TO CONVERT THE PITI #8 AND #9 SLOW-SPEED DIESEL UNITS TO BURN ULTRA LOW SULFUR DIESEL FUEL

What is the project's objective and is it necessary and urgent?

Piti Units 8&9 are under a Consent Decree in Federal Court. The Consent Decree mandates GPA to contract for the conversion of the units to burn ultra-low sulfur diesel (ULSD) to comply with USEPA National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines (RICE NESHAP).

The project to be implemented by MEC and BWSC provides a technical solution to eliminate the Sulphur oxide emissions and comply with the Consent Decree and new USEPA NAAQS rules. The Piti 8&9 units are critical for system reliability until the new power plant is commissioned.

Where?

Piti #8 and #9 Slow Speed Diesel Units

How much will it Cost:

MEC submitted a proposal of \$14,141,045.28 for the conversion

What is its funding Source?

Cabras 3&4 Insurance Proceeds

When will it be completed?

MEC proposes the full conversion to be completed within 15 months after contract signing.



CONSOLIDATED COMMISSION ON UTILITIES
Guam Power Authority | Guam Waterworks Authority
P.O. Box 2977 Hagatna, Guam 96932 | (671) 648-3002 | guamccu.org

GPA RESOLUTION NO. 2021-01

RELATIVE TO AUTHORIZING THE GUAM POWER AUTHORITY TO CONVERT THE PITI #8 AND #9 SLOW-SPEED DIESEL UNITS TO BURN ULTRA-LOW SULFUR DIESEL FUEL

WHEREAS, Piti #8 and #9 Slow Speed Diesel Units provide up to 88-MW Capacity of the island-wide power system and are crucial in ensuring that GPA is able to provide the required energy for the island between now and the commissioning of the new 198-MW Ukudu Power Plant; and

WHEREAS, ownership of the Piti 8 & 9 units transferred from Marianas Energy Company (MEC) to Guam Power Authority (GPA) on January 29, 2019 and GPA extended the Energy Conversion Agreement with MEC until January 29, 2024 upon receiving CCU and PUC approvals, in order to ensure the units' availability and reliability; and

WHEREAS, the units are subject to the Consent Decree; approved by the CCU and PUC and filed in Federal Court on February 6, 2020 by the Department of Justice (DOJ) on behalf of the U.S. Environmental Protection Agency (USEPA); which outlines the settlement between GPA and USEPA to comply with National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines (RICE NESHA); and

WHEREAS, the Consent Decree stipulated that GPA contract for the conversion of the units to burn ultra-low sulfur diesel (ULSD) by July 1, 2020 and for full conversion to ULSD-firing by December 31, 2021; and

WHEREAS, GPA resolution No. 2020-14, the CCU authorized GPA to plan for the retirement of Piti 8 & 9 and to request USEPA to modify the consent decree to retire Piti 8 & 9 in lieu of conversion to ULSD; and

WHEREAS, as a result of the delay of the commissioning date of the new Ukudu power plant due to COVID-19 and permitting issues, and USEPA's new National Ambient Air Quality Standards (NAAQS) effective April 2023, GPA determined that in order to comply with the April 2023 NAAQS, the Piti 8 & 9 plant capacity burning low sulfur residual fuel oil would need to be limited by as much as 20% which would have a significant impact on system reliability; and

1 **WHEREAS**, this reduction in system capacity would negatively impact system reliability
2 beginning in April 2023 and continuing on until the Ukudu power plant is commissioned; and

3 **WHEREAS**, to ensure system reliability between now and the commissioning of the new
4 Ukudu power plant, GPA will proceed with converting Piti 8 & 9 to ULSD thereby achieving
5 compliance with the both the RICE NESHAP and April 2023 NAAQS without impacting system
6 reliability; and

7 **WHEREAS**, GPA, USEPA and DOJ are in amicable discussions for the modification of the
8 consent decree due to delays resulting from COVID-19 and permitting issues; and

9 **WHEREAS**, GPA recently updated the consent decree timelines to USEPA and DOJ, for
10 their consideration, for the conversion of Piti 8 & 9 to ULSD, to contract with MEC by March 31,
11 2021 and complete the conversion by August 31, 2022; and

12 **WHEREAS**, the project to be implemented by MEC and BWSC provides a technical
13 solution and a concept that will fulfill the requirements to comply with USEPA rules in relation
14 to SOx and CO emissions including meeting the April 2023 NAAQS; and

15 **WHEREAS**, MEC submitted an updated proposal for the conversion of the units, with an
16 estimated cost of **\$14,141,045.28** as shown in **Appendix A**, excluding the fuel supply system
17 which is separately funded and handled by GPA; and

18 **WHEREAS**, MEC proposed to complete the conversion of Piti 8 & 9 to ULSD within 15
19 months after contract signing,

20 **NOW, THEREFORE, BE IT RESOLVED, by the CONSOLIDATED COMMISSION ON**
21 **UTILITIES (CCU), subject to the review and approval of the PUBLIC UTILITIES COMMISSION**
22 **(PUC), as follows:**

- 23 1. GPA is authorized to contract with MEC for the conversion of the Piti 8 & 9 Slow
24 Speed Diesel Units to burn Ultra Low Sulfur Diesel fuel at a cost of **\$14,141,045.28**
25 with a project completion date of 15 months after contract signing.
- 26 2. GPA shall fund the conversion with Cabras 3 & 4 insurance proceeds.

1 **RESOLVED**, that the Chairman certified, and the Board Secretary attests the adoption of
2 this Resolution.

3
4 **DULY AND REGULARLY ADOPTED AND APPROVED THIS 26TH DAY OF JANUARY, 2021.**

5 Certified by:

Attested by:

6
7
8
9 _____
10 JOSEPH T. DUENAS
11 Chairperson
12 Consolidated Commission on Utilities

MICHAEL T. LIMTIACO
Secretary
Consolidated Commission on Utilities

13
14
15 **I, Michael T. Limtiaco**, Secretary for the Consolidated Commission on Utilities (CCU), as
16 evidenced by my signature above do certify as follows:

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

21
22 Ayes: _____

23 Nays: _____

24 Absent: _____

25 Abstain: _____
26
27
28



180 Cabras Highway
Piti, Guam 96915
Tel: (671) 477-3060
Fax: (671) 477-3154

January 20, 2021

Melinda C. Mafnas
Assistant General Manager of Operations
Guam Power Authority
P.O. Box 2977
Hagatna, Guam 96932

Subject: Proposal for the Conversion of Piti Power Plant Engine #8 and #9 from HFO to ULSD

Dear Melinda:

We are pleased to provide our current proposal for the ULSD Conversion in coordination with BWSC. Notwithstanding the final details, we further commit to the following:

1. Subject to the final terms and conditions based on industry standards and in accordance with the existing GPA-MEC contract for operations of Piti 8&9, including acceptable force majeure and COVID-19 clauses, MEC (The Contractor) is committed to a delivery time not later than 14.5 months after effective date of the contract.
2. If the Contractor fails to comply with the Time for Completion, the Contractor shall, subject to not being entitled to an extension of time, pay delay damages to GPA for this default. These delay damages shall be in the amount of one-fourth of one percent (1%) of the outstanding order for every day which shall elapse between the relevant Time for Completion and the date stated in the Taking-Over Certificate. However, the total amount due shall not exceed 5% of the whole outstanding order."

The BWSC proposal submitted earlier defines the work scope and the description of the technical solution, which is the basis for MEC's proposal. The proposed price breakdown is as follows:

DESCRIPTION	PROPOSAL (USD Currency)
PITI UNITS 8 & 9 (2 Units)	
ULSD Conversion all-in price proposal	\$ 12,150,600.00
Add: 30% Withholding tax on Foreign Labor (\$486,016 X 30%)	\$ 145,804.80
Add: 5% GRT on Local Labor (\$2,000,000 X 5%)	\$ 100,000.00
Subtotal	\$ 12,396,404.80
Add: 10% MEC EPC Fee	\$ 1,239,640.48
Sub Total	\$ 13,636,045.28
Add: MEC Projects (as requested by GPA)	
1. Boiler Effluent Tanks cleaning	\$ 30,000.00
2. Fuel pipeline flushing	\$ 25,000.00
3. Tank Cleaning Projects	\$ 450,000.00
--- HS HFO & LS HFO Storage Tank (120,000/ea)	240,000.00
--- HS HFO & LS HFO Service Tank (80,000/ea)	160,000.00
--- HFO Buffer Tank	50,000.00
Over-All Total Proposal	\$ 14,141,045.28

Thank you for the opportunity to submit our proposal and I look forward to meeting with your team to address any concerns you may have.

Regards,

Rino T. Manzano
General Manager

ULSD Conversion MEC 8 & 9

1	BWSC Proposal	\$	12,150,600.00
	Foreign Labor		\$486,016.00
2	30% wh on foreign labor	\$	145,804.80
	Local Labor		\$2,000,000.00
3	5% grt on local labor	\$	100,000.00
	SUBTOTAL	\$	12,396,404.80
4	10% MEC EPC Fee	\$	1,239,640.48
	TOTAL COST	\$	13,636,045.28

Additional MEC Projects

Boiler Effluent Tanks cleaning	\$	30,000.00
Fuel pipeline flushing	\$	25,000.00

Tank Cleaning Projects

HS HFO Storage Tank	\$	120,000.00
LS HFO Storage Tank	\$	120,000.00
HS HFO Service Tank	\$	80,000.00
LS HFO Service Tank	\$	80,000.00
HFO Buffer Tank	\$	50,000.00
TOTAL ADDITIONAL MEC PROJECTS	\$	505,000.00

GRAND TOTAL MEC CONVERSION \$ 14,141,045.28

- 1 Schedule: 14 1/2 months from NTP
- 2 Outage: 12 days per unit
- 3 Testing and commissioning: 10 days per unit
- 4 Oxidation catalyst warranty 24,000 running hours
8,000 annual running hours per unit
- 5 MEC Capacity 85.56 MW after conversion
- 6 Proposal Valid until February 16, 2021

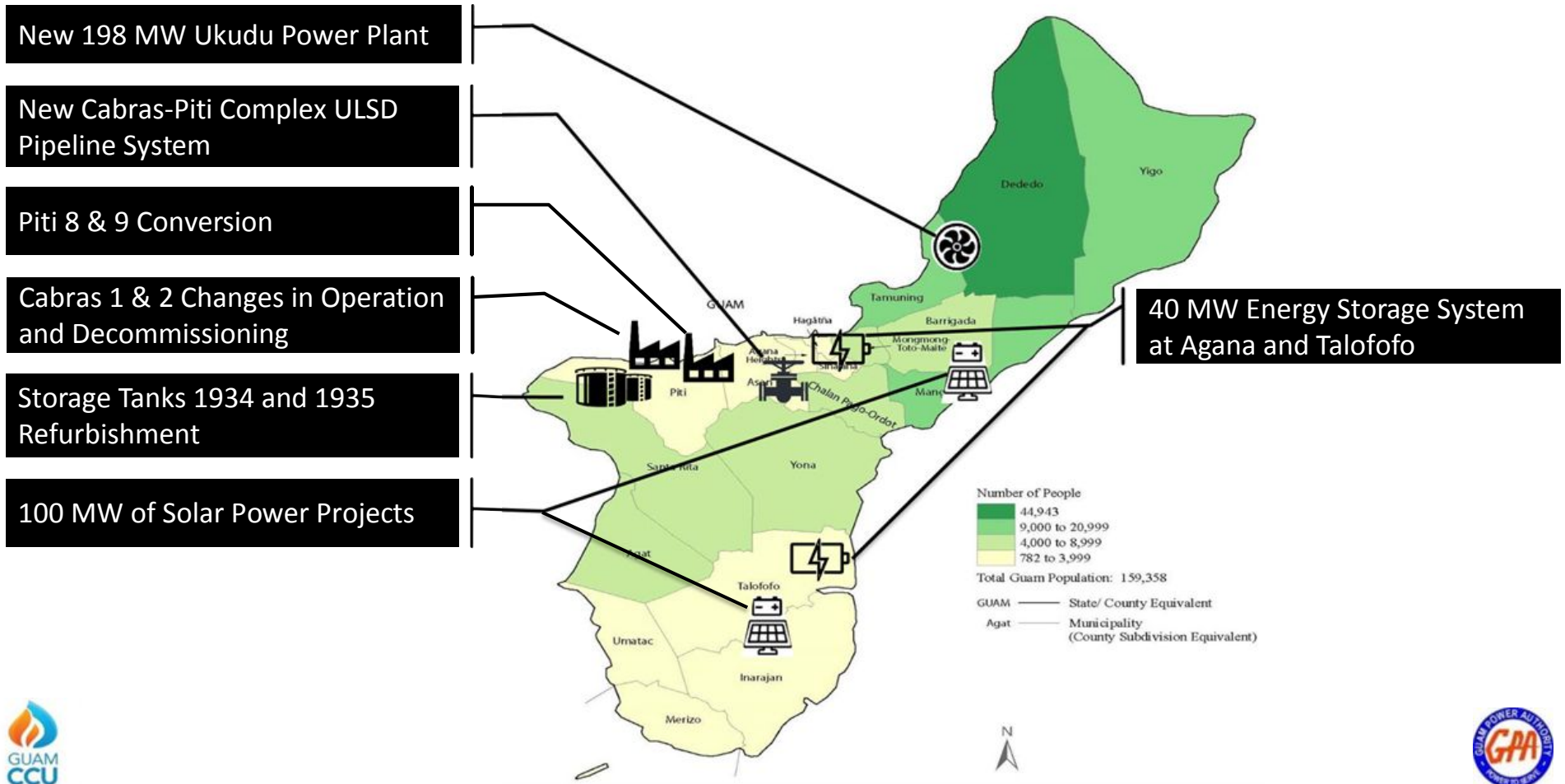
PROPOSED AMENDMENT OF THE UKUDU POWER PLANT ENERGY CONVERSION AGREEMENT

January 21, 2021



CONSENT DECREE KEY PROJECTS:

2



Ukudu Power Plant Energy Conversion Agreement (ECA) Amendment



What is KEPCO Required to Provide to GPA?

4

Power Plant

198 MW

- Combined cycle power generation plant
- Dual-fired: ULSD [Oct 2022]
- Three (3) Siemens ST800 45 MW gas turbines are each connected to its own heat recovery steam generator (HRSG)
- Steam generated by HRSGs is collected in a common pipeline and is sent to a single 63 MW steam turbine
- Steam existing the steam turbine is condensed in mechanical drive cooling tower, and condensate is sent back to the HSRGs

EFFICIENCY OF MACHINES

- Net heat rate is designed to be 6,648 Btu/kWh when operating on ULSD at 100% load based on fuel higher heating value (HHV), which translates into efficiency of 51%

AVAILABILITY

- Guaranteed forced outage hours constant at 175.2 hours per Contract Year (2% of the total number of hours in a year)
- Guaranteed total outage hours vary between 2.02% and 6.95% per year depending on the Facility maintenance schedule
- Reserve Unit makes up for Power Plant Facility outages to the limit of its permitted operating hours



Reserve

65 MW

- Twenty-six (26) high speed reciprocating engines operating on ULSD
- Provides system reserve capacity

AVAILABILITY

- Designed for operation of no more than 500 hours per year and of no more than 300 hours of continuous operation

BESS

25 MW

- Battery energy storage facility
- Peak discharge capacity of 25 MW
- Storage capacity of 30 minutes



Why is an Amendment Necessary?

5

Air Permitting Challenges

- KEPCO pursued Major Source Permitting to meet its performance obligations
- Major source permitting would result in substantial delays which USEPA was not pleased with
- Minor source permit process results in shorter commissioning period but seemed not economically feasible for KEPCO due to higher capital investment requirements in order to meet contract performance guarantees
- Detrimental impact on GPA, Consent Decree, and system reliability, if contract is terminated or KEPCO walked away because contract was no longer economically feasible; a negotiated alternative solution was the best option
- Termination of contract not in GPA's best interest because at this point termination damages limited to \$3M; GPA would be subjected to substantial stipulated penalties under consent decree; and it would take several years to secure another contract if at all
- Best solution for both parties is to agree on a win-win solution which we did and presented here in form of an amendment



COVID-19 Related Delays

- Availability of relevant agencies during pandemic due to closures
- Quarantine requirements
- Work inefficiencies resulting from changes in operating mode

Environmental & Construction Permitting Challenges

- First new power plant construction in 23 years
- Resources of permitting agencies taxed
- Substantially increased scrutiny on Historical preservation and environmental permitting due to military buildup and other community concerns
- Environmental and Archeological assistance resources limited



ECA Amendment

6

The proposed ECA Amendment is subject to CCU and PUC approvals and USEPA general acceptance and willingness to modify consent decree

KEPCO REQUIREMENTS

- Permit the Ukudu plant under minor source.
- New COD date is no later than April 2024 with best efforts of November 2023.
- Construct, operate and maintain over the term of the ECA 41 MW of continuous operating diesel capacity fully dispatchable by GPA at a Cabras site to be provided.
- Plant to consist of 15 units of 2.75 MW capacity each available for continuous operations.



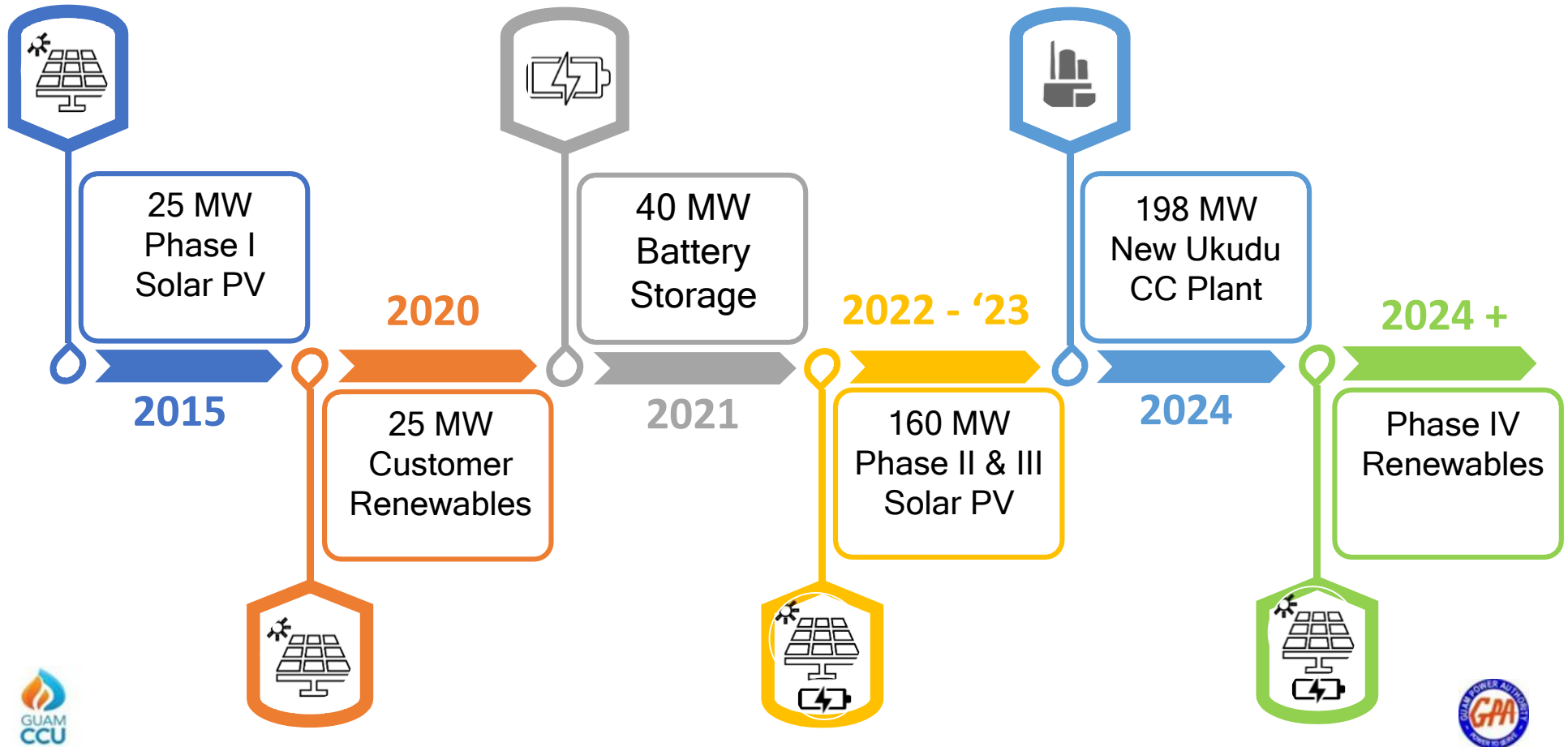
GPA REQUIREMENTS

- Amend ECA to reflect the agreed-upon changes.
- Provide a Cabras location for siting the new 41 MW diesel plant.
- Fixed OM of \$2M annually; Variable O&M of \$0.025/kWh; GPA provides ULSD.
- Adjust plant availability from 85% to 64% on ULSD during steam turbine overhaul once every 4 years.



Updated Milestones - Greater than 25% Renewables by Jan 2024

7



UPDATED CONSENT DECREE FUEL COST IMPACT:

8

Calendar Year	2019	2021	2022	2023	2024	2025
Annual Net Kwh	1,707,338,991	1,707,338,991	1,732,566,512	1,758,555,009	1,784,933,335	1,811,707,335
Average HSRFO/LSRFO \$/BBL	\$75.00	\$65.00	\$65.00	DISCONTINUED	DISCONTINUED	DISCONTINUED
ULSD \$/BBL	\$94.00	\$85.00	\$85.00	\$85.00	\$80.00	\$80.00
0.2% S LSRFO NEW 2023				\$80.00	\$80.00	DISCONTINUED
Net KWH Production						
Cabras 1/2	644,466,000	644,466,000	644,466,000	644,466,000	219,118,440	RETIRED
Piti 8&9 RFO	625,632,000	625,632,000	419,173,440	DISCONTINUED		
Piti 8&9 ULSD			206,458,560	625,632,000	212,714,880	92,650,502
New Ukudu Plant					837,814,722	1,300,860,000
Total Baseload	1,270,098,000	1,270,098,000	1,270,098,000	1,270,098,000	1,269,648,042	1,393,510,502
ULSD Reserve Units Production	390,044,158	390,044,158	415,271,679	300,260,176	102,088,460	5,000,000
Renewables Production						
Phase I @ \$0.215/kWh	47,196,833	47,196,833	47,196,833	47,196,833	47,196,833	47,196,833
Phase I KEPCO @ \$0.085/kWh				141,000,000	141,000,000	141,000,000
Phase II HANWAH @ \$0.085/kWh					141,000,000	141,000,000
Phase III ENGIE @ \$0.110/kWh					84,000,000	84,000,000
Total Renewables:	47,196,833	47,196,833	47,196,833	188,196,833	413,196,833	413,196,833
Total Production:	1,707,338,991	1,707,338,991	1,732,566,512	1,758,555,009	1,784,933,335	1,811,707,335
Fuel/Renewables Cost:						
Base Load	\$144,230,220	\$125,283,058	\$134,289,496	\$168,933,960	\$135,595,670	\$135,277,051
Intermediate	\$76,507,973	\$69,182,742	\$73,657,386	\$53,257,617	\$17,042,437	\$834,690
Renewables	\$10,147,319	\$10,147,319	\$10,147,319	\$22,132,319	\$43,357,319	\$43,357,319
Total Direct Fuel Cost:	\$230,885,512	\$204,613,118	\$218,094,201	\$244,323,895	\$195,995,426	\$179,469,060
Add Fuel Infrastructure Cost:	\$17,500,000	\$17,500,000	\$17,500,000	\$17,500,000	\$17,500,000	\$5,000,000
Total Fuel Cost:	\$248,385,512	\$222,113,118	\$235,594,201	\$261,823,895	\$213,495,426	\$184,469,060
Fuel Cost Savings:		-\$26,272,394	-\$12,791,311	\$13,438,383	-\$34,890,086	-\$63,916,452
\$/kWh LEAC	\$0.145	\$0.130	\$0.136	\$0.149	\$0.120	\$0.102
Fuel Oil Barrels Reduction		4,362	97,984	-58,814	-829,008	-1,035,587
% renewables	6.0%	6.0%	5.9%	14.8%	28.6%	28.1%



COMPARISON OF PRODUCTION COST:

9

Description	MEC	Aggreko	Medium Speed	Northern CTs	TEMES 7	Cabras 41 MW
Total kW Capacity:	85,000	40,000	40,000	80,000	40,000	41,000
Annual Non-Fuel All-In Cost:	\$10,000,000	\$5,500,000	\$3,466,027	\$3,714,415	\$1,336,614	\$4,316,263
Annual Capacity Factor:	12.7%	27.9%	27.9%	13.9%	27.9%	27.2%
Annual Net kWh:	97,650,502	97,650,502	97,650,502	97,650,502	97,650,502	97,650,502
Non-Fuel \$/kWh:	\$0.102	\$0.056	\$0.035	\$0.038	\$0.014	\$0.044
Net Heat Rate kWh/Gal ULSD:	15.5	12.5	13.5	10.0	9.0	14.0
\$/BBL ULSD:	\$80.00	\$85.00	\$85.00	\$85.00	\$85.00	\$80.00
\$/kWh ULSD Fuel Cost:	\$0.12	\$0.16	\$0.15	\$0.20	\$0.22	\$0.14
TOTAL PRODUCTION COST	\$0.2253	\$0.2182	\$0.1854	\$0.2404	\$0.2386	\$0.1803
Age (Years):	23	6	28	28	24	0
Number of Units:	2	40	10	4	1	15
Annual Availability:	92%	95%	90%	90%	90%	95%



Recommendation:

10

Approval of Resolution 2021-02 will authorize the General Manager to amend the ECA:

- To allow KEPCO to pursue minor source air permit and commission the Ukudu plant by no later than April 2024 with best efforts of a completion by November 2023
- To allow the relocation of the standby diesel units from Ukudu site to a Cabras site near the GPA bulk fuel oil storage tank facility.
 - The diesel plant shall consist of 41 MW continuous operating capacity permitted to the maximum allowable operating hours under a minor source permit.
 - GPA will pay a fixed O&M fee of \$2,000,000 annually and a variable O&M fee of \$0.025/kWh for energy delivered to the GPA system for the term of the ECA agreement.
 - Ownership of the plant is to be transferred to GPA at that time at no cost.

This solution provides a win-win solution for both parties which would provide for the expeditious execution of the contract.





GUAM POWER AUTHORITY
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Issues for Decision

Resolution No. 2021-02:

RELATIVE TO AUTHORIZATION OF UKUDU POWER PLANT ENERGY CONVERSION AGREEMENT (ECA) AMENDMENT FOR RELOCATION OF EMERGENCY DIESEL UNITS AND PURSUIT OF MINOR SOURCE AIR PERMIT

What is the project's objective? Is it necessary and urgent?

Guam Power Authority (GPA) and Guam Ukudu Power (GUP) LLC signed the Energy Conversion Agreement (ECA) for the construction, operation and transfer of a 198 MW power plant to be sited on GPA owned property in Ukudu, Dededo. Guam Ukudu Power (GUP) LLC is a local company formed by the KEPCO-EWP consortium (“KEPCO-EWP”).

The relocation of the emergency diesel units will allow the Ukudu Power Plant to be permitted as a minor source air permit plant which will significantly reduce the permit process and overall construction and commissioning schedule of the new plant. This would minimize delays on the retirement of the Cabras 1&2 Power Plant as per the consent decree. The consideration for the relocation of these diesel units includes a separate O&M cost that would also provide GPA access and use of these units to support the Island-Wide Power System (IWPS) outside of any Ukudu Power Plant outages. Its efficiency and operating costs along with the Yigo Diesel Units (formerly Aggreko units) would allow for the retirement of older and costlier Power Plants.

Where is the location?

The site for the relocated diesel units is adjacent to the GPA bulk storage tanks in Piti.

How much will it cost?

GPA has negotiated for a 41MW diesel plant with improved engines for continuous operations with a fixed O&M cost of \$2,000,000 annually and a variable O&M cost of \$0.025/kWh net production when dispatched by GPA.

When will it be completed?

Guam Ukudu Power LLC has provided a schedule for minor source air permit path with the new COD of the Ukudu plant to be no later than April 2024 with best efforts to achieve a target COD of November 2023.

What is its funding source?

Revenue Funds



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

1
2 **RESOLUTION NO. 2021-02**

3
4 **RELATIVE TO AUTHORIZATION OF UKUDU POWER PLANT ENERGY CONVERSION**
5 **AGREEMENT (ECA) AMENDMENT FOR RELOCATION OF EMERGENCY DIESEL UNITS AND**
6 **PURSUIT OF MINOR SOURCE AIR PERMIT**
7

8 **WHEREAS**, Guam Power Authority (GPA) and Guam Ukudu Power (GUP) LLC signed the Energy
9 Conversion Agreement (ECA) for the construction, operation and transfer of a 198 MW power plant
10 to be sited on GPA owned property in Ukudu, Dededo; and

11 **WHEREAS**, GUP LLC is a local company formed by the KEPCO-EWP consortium ("KEPCO-
12 EWP"); and

13 **WHEREAS**, the anticipated Commercial Operation Date (COD) of the Ukudu Power Plant was
14 October 2022; and

15 **WHEREAS**, GPA expected that the new plant would be permitted under a minor source air
16 permit application process, although not specifically noted in the RFP, which would provide the
17 shortest timeframe to commission a new power plant; and

18 **WHEREAS**, to comply with bid reserve requirements, GUP LLC added 65 MW of standby
19 generators with a maximum 500 hours of operations to the site; and

20 **WHEREAS**, it was determined that the emergency diesel units required to operate during
21 Ukudu unit outages would significantly limit plant operations under a minor source permit during a
22 scheduled 23-day steam turbine outage which occurs every four years; and

23 **WHEREAS**, GPA and GUP LLC attempted to negotiate a minor source permit process early in
24 2020 but GUP LLC noted significant estimated cost overruns causing negotiations to fail and GUP LLC
25 pursued a major source air permit path; and

26 **WHEREAS**, USEPA expressed significant concerns on GUP LLC'S major source air permit path
27 because of significant delays which would occur because of lengthy air monitoring requirements
28 before a major source permit could be issued which would move COD past 2025; and

29 **WHEREAS**, USEPA encouraged GPA to work out an alternative which would permit the plant
30 under minor source; and

31 **WHEREAS**, in August 2020 GPA and GUP LLC again initiated discussions for a minor source
32 path and reached an agreement, **Attachment A**, which included the following:

- 33 • Permit the UKUDU Combined Cycle Plant as a minor source air permit.
- 34 • Install forty- one megawatts (41 MW) of diesel engines with continuous operation
35 capability near the GPA Cabras Bulk Fuel Oil Storage Facility and permit the plant for
36 maximum operational hours (~5000hrs).
- 37 • Agreed on a Fixed and Variable O&M rate to compensate for the operation and
38 maintenance of the new diesel plant fully dispatchable anytime by GPA; and
39

40 **WHEREAS**, a minor source air permit path would alleviate USEPA concerns on the overall
41 permitting and construction schedule of the Ukudu Power Plant and any further delays in the
42 retirement of the Cabras 1&2 Power Plant; and

43 **WHEREAS**, although the diesel engines are for a reduced capacity, the diesel engines are units
44 which could be operated in excess of 500 hours to support the entire Island-Wide Power System
45 (IWPS) and its efficiency and operating costs along with the Yigo Diesel Units (formerly Aggreko units)
46 could allow for the eventual retirement of older units; and

47 **WHEREAS**, GPA's analysis of future generation system reliability shows that relocating the
48 GUP LLC Diesel Plant provides significant additional value to GPA significantly increasing the peak load
49 carrying capability of the GPA system, in addition to allowing retirements of older generating units
50 which would reduce costs; and

51 **WHEREAS**, the proposed location of the new diesel plant eliminates costly fuel trucking cost
52 and will have minimal interconnection costs because of its proximity to GPA's future ULSD bulk
53 storage fuel tanks and also GPA transmission lines; and

54 **WHEREAS**, GUP LLC recently replaced its Engineering, Procurement and Construction
55 contractor Hyundai due to delays and potential cost overrun issues with schedule uncertainty, and
56 contracted Doosan Industries in December 2020 on a minor source path and based on the GPA
57 August 2020 proposal; and

58 **WHEREAS**, over the past year, GUP LLC and its contractors and consultants have gained
59 considerable experience for construction on Guam and has completed substantial work on the air
60 permit and the Environmental Impact Assessment (EIA), which are also required for minor source
61 permitting and supports the new schedule as achievable; and

62 **WHEREAS**, GPA would urgently seek support from air permitting agencies to prioritize the
63 power plant work to ensure progress on the plant schedule will meet the USEPA consent decree and
64 to minimize any further delays due to the COVID pandemic; and

WHEREAS, an amendment is required of the GUP LLC/GPA ECA which increases the contract cost above the GPA General Manager's approval authority; and

WHEREAS, GPA is in discussions with USEPA for a modification of the consent decree to reflect the proposed new power plant minor source air permit schedule and appears to be on track towards such modification.

NOW, THEREFORE, BE IT RESOLVED, by the CONSOLIDATED COMMISSION ON UTILITIES (CCU), subject to the review and approval of the PUBLIC UTILITIES COMMISSION (PUC), as follows:

1. The CCU authorizes GPA to amend the Ukudu Power Plant Energy Conversion Agreement (ECA) for the relocation and operation of 41MW diesel units with a fixed O&M cost of \$2,000,000 annually and a variable O&M cost of \$0.025/kWh net production when dispatched by GPA.
2. The CCU authorizes GPA to amend the ECA to require Guam Ukudu Power (GUP) LLC to pursue a minor source air permit with the new COD of the Ukudu plant to be no later than April 2024 with best efforts to achieve a target COD of November 2023.

RESOLVED, that the Chairman of the Commission certifies and the Board Secretary attests the adoption of this Resolution.

DULY and REGULARY ADOPTED AND APPROVED THIS 26th DAY of JANUARY, 2021

Certified by:

Attested by:

JOSEPH T. DUENAS

Chairperson
Consolidated Commission on Utilities

MICHAEL LIMTIACO

Secretary
Consolidated Commission on
Utilities

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

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

Ayes: _____

Nays: _____

Absent: _____

Abstain: _____

RESOLUTION 2021-02
ATTACHMENT A

Conditions for DG Plant relocation and Minor Air Permit Acquisition for Ukudu Project

No.	Item	Issue
1.	Site and Pre-existing Condition	GPA shall lease the site for Reserve Facility at Cabras and provide the rights of way and easement of the site to Guam Ukudu Power LLC. The Pre-existing Condition and Pre-existing Condition Period in ECA shall cover the Cabras site, fuel line, power interconnection line and water line. Pre-existing Reserve Facility (DG Site) Condition means any artificial obstructions on, under, in, or affecting the Reserve Facility Site or any contamination (whether occurring before or after the ECA Amendment Date, but not resulting from Project Company's or Contractor's activities on the Reserve Facility Site) that could not reasonably discovered prior to the ECA Amendment Date by an experienced engineering and construction contractor using the most sophisticated devices and personnel available at the time of Reserve Facility Site investigation by such contractor but shall not, for the avoidance of doubt, include archaeological discoveries on the Reserve Facility Site.
2.	Reserve Facility, DG Spec	41MW (Gross) Continuous Operating Prime (COP) model shall be selected to maximize operating hours of diesel plant.
3.	Commercial Operation Date	Even though the COD for Facility and Reserve Facility shall be the same (FC + 29 months), however, the required construction period for Reserve Facility is EIA approval for Reserve Facility Site + 27 months. Irrespective of the Reserve Facility COD achievement, the Facility COD shall be achieved separately and the Capacity Charge shall be paid in accordance with ECA. For avoidance of doubt, payment of FOMC and VOMC for the Reserve Facility do not start until the COD for Reserve Facility is achieved.

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No.	Item	Issue
4.	FOMC and VOMC for DG plant	FOMC: \$2M per year VOMC: \$0.025/kWh Both FOMC and VOMC shall be escalated as per ECA for 25 years and start to be paid from Reserve Facility COD. Same condition regarding Deemed Capacity for CCPP FOMC payment in ECA shall be applied to Reserve Facility as well. Above charges are based on the following conditions: - The design assumption complies with GPA's requirement in the GPA proposal dated August 20, 2020 - The finalized design assumption shall be attached later in this document - Transmission, Fuel line and Communication line terminal points are at the Reserve Facility Site boundary. For avoidance of doubt, communication line for SCADA and PABX between the Reserve Facility and GPA dispatch center shall be provided by GPA. Project Company is responsible for telephone and internet line for office. - Project company is responsible for water and sewer connections.
5.	First Fill and Commissioning Fuel for DG Plant	The i) First Fill of 3-days-tank 840 m ³ and ii) Commissioning Fuel (ULSD) capped at 103,871 MMBtu based on 3-day Reliability Run Test shall be provided by GPA
6.	Electricity for Commissioning and Testing for DG	The electricity for commissioning and testing for DG to be provided by GPA capped at 369,375 kWh.
7.	Limitation of Annual Capacity Factor for CCPP Plant	Annual Capacity Factor shall be limited to Air Permit condition. Currently, - 85% on both ULSD and NG operation for Contract Years without steam turbine maintenance, and - 58% on ULSD, 83% on NG for Contract Years with steam turbine maintenance. * 58%-64% capacity factor on ULSD based on the number of startup/shutdown, which is subject to GEPA's approval on equation basis permit application

No.	Item	Issue
8.	ECA amendment	The items listed above are subject to GPA regulatory approvals. GPA will make best effort to obtain CCU, PUC and USEPA approvals for amendment to the ECA accommodating Minor Air Permit, relocation of the Reserve Facility and other issues by 31 Mar., 2021. The Construction Contract will be executed on Dec 17, 2020 based on Minor Air Permit and relocation of Reserve Facility.

The target COD for Facility and Reserve Facility shall be November 30, 2023. Guam Ukudu Power, LLC and GPA shall make all best efforts to reduce the projected April 2024 COD date to meet this target COD.

Acknowledged and Accepted by

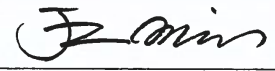
Guam Power Authority



Name : John M. Benavente, P.E. – General Manager

Date : Dec 11, 2020

Guam Ukudu Power, LLC



Name : Jeong-irl Min – CEO of Guam Ukudu Power, LLC

Date : Dec. 11, 2020

GPA PROPOSAL FOR MINOR SOURCE PATH

AUGUST 20, 2020

OBJECTIVE:

Determine an alternative to expedite the completion of the new Ukudu Power Plant. KEPCO is proceeding on major source permitting which in GPA's opinion would delay project completion by more than 18 months. Delay of COD is not in either party's interest and is a significant issue to USEPA under the consent decree.

Cause of Delay:

- The permitting of the 198MW CCPP together with 65 MWs of Diesels is not practical under minor source because emissions would be substantially more than the 100 tons/year emission limitation of minor source. There will be severe limitation of CT simple cycle operations coupled with operations of the 65MW diesels whenever the 63MW steam turbine experiences a forced outage or is under its typically 23 days overhaul approximately every 4 years of operations.
- The Commercial Operations Date (COD) of October 2022 was premise on a minor source permitting process but plant capacity will be significant limited during steam turbine outages and its overhaul every four years because of significant limitation on operations of plant on combustion turbine simple cycle coupled with 65 MW of diesel capacity due to maximum emission allowed under minor source.
- Major source permitting may potentially permit plant for intended use but the permitting requirements include stringent ambient air monitoring analysis which typically takes a minimum of 1 year. Therefore, this process would likely extend COD by 18 months to 30 months.
- USEPA is quite concerned by the potential significant delay of COD and is looking to both parties to work on an alternative solution which has the plant permitted under minor source.

GPA's PROPOSED ALTERNATIVE:

- **Permit UKUDU Combined Cycle Power Plant (CCPP) under minor source process as follows:**
 - Permit CCPP at Ukudu site for not less than 85% capacity factor under minor source. Plant availability of CCPP would remain as per ECA but for each of the steam turbine overhaul years plant capacity factor is reduced to 85%.
 - Plant to be permitted under a 12-month rolling average which would require coordination and planning between the parties to dispatch plant as necessary in combined cycle to insure simple cycle operations is achievable during planned steam turbine outages.

- o Construct, operate and maintain the 49 MW (15 units @ 3.2 MW peaking capacity and 2.75 MW continuous capacity) of diesel generators (in accordance with the draft specifications provided herein as Attachment A) at a Cabras site which would be leased to KEPCO similar to conditions of the ECA.
 - GPA to provide KEPCO the property site for the 49 MW plant within one year of this agreement.
 - GPA to approve new plant generating unit specifications including layout and plant design within 6 months of ECA amendment.
 - Units are to be equipped with remote starting capabilities for startup from GPA power system control center.
- o The COD of both the CCP and the Diesel plant is to be reset to November 2023, subject to USEPA approval.
- o **GPA would pay an annual fixed O&M Fee of \$2.0 M and a variable fee of \$0.025 / kWh for following:**
 - Plant Peaking Capacity Of 49 MW Gross
 - Continuous Operating Plant (COP) Capacity of 41 MW
 - KEPCO to pursue maximum permissible hours or ULSD fuel consumption under minor source
 - Plant availability 94%
- o Plant to be dispatchable by GPA up to EPA approved minor source limitation.

Financial Closing and Performance Bond:

- An amendment of the ECA would be required of the parties
- The financial closing date is to be re-adjusted based on minor source permitting
- KEPCO will provide GPA a minimum of 50% (Approximately \$40M) of the performance bond amount set in ECA within 15 days after ECA amendment. The performance bond is currently due at financial closing in the amount of about \$78M. The balance of the bond to be provided at financial closing.
- All other provisions of the ECA contract remains in place.

ECA Amendment Process: The following is the process for the ECA amendment.

- KEPCO and GPA agree on proposed amendment
- GPA discusses agreement with USEPA in order to get their buy-in to the change in permit process and the proposed new COD schedule
- GPA pursues CCU and PUC approvals (typically accomplished within 1 to 2 months
- Amendment signed. Both parties work together to achieve COD date.

Attachment A

No.	Item	Design Assumption
	Permits	KEPCO responsible for all construction and operating permits for plant and would be responsible for compliance until Plant turnover is made after 25 years. GPA will make best efforts to assist KEPCO.
A		Design Assumption
A-1	Location	As per preliminary review about location, HEC assumed the project location to reduce fuel system and transmission line as follows. 
A-2	Out of Scope	Following items are not considered in scope of supply. 1) Demolition work in existing area 2) New Transmission Line or Transmission line modification. KEPCO provides DG Substation and provides GPA 115KV terminal point for tie in of 115KV transmission line 3) ROW, Easement
A-3	MEC	MEC is not considered for site and ROW area for temp. facility
No.	Item	Design Assumption
A-4	Utility Design (Storm Water)	KEPCO Responsibility

A-5	Utility Design (Potable Water, well pump))	KEPCO Responsibility
A-6	Utility Design (Sewer)	KEPCO Responsibility
A-7	Utility Design (Oily Waste Water)	KEPCO Responsibility
No.	Item	Design Assumption
A-8	Utility Design (compressed air)	KEPCO Responsibility
A-9	Utility Design (Fuel Supply)	It is assumed that Diesel oil to be supplied from new ULSD pipeline. For standby, One (1) of Unloading connection point is considered. KEPCO to provide fuel oil line and valve at edge of property line for GPA to tie in supply line.
A-10	Capacity of fuel storage	Followings are assumed. 1) New fuel storage tank is not necessary 2) One day tank is considered for 3-day supply And each fuel tanks for DG will be installed additionally inside the container of DG for reliable operation.
A-11	Capacity of fire water tank	KEPCO Responsibility
A-12	Terminal point of electrical system	Terminal point of electrical system - Power Delivery Point : at cable terminal of transmission line of 115KV Breaker - Telecommunication (to SCADA) : at cable terminal of RTU located in 115 kV Substation Building - Communication (by PABX) : at cable terminal of PABX located in DG Control Building
A-13	Building List	KEPCO Responsibility: provide adequate buildings for management, operations and maintenance and ware housing needs.
A-14	Civil	
A-15	115 kV Substation Telecommunication to SCADA	1) Subsurface(geotechnical) condition of the site is suitable for cutting and excavation without any breaker, blasting and etc. 2) upon agreement, GPA to pursue boring data A RTU for 115 kV substation telecommunication to SCADA is considered.
A-16	Communication System	PABX, PA system, LAN system, CCTV are considered for DG Power Plant.
A-17	Lighting System	KEPCO Responsibility

A-18	Diesel Engine	Followings are design for DG - Emission Limit : Tier 4 Diesel Engine - To be permitted to maximum production under minor source - Diesel Engine Rating : COP (Continuous Power) - Gross Output : 2.75MW /unit x 15ea = 41.25 MW COP; Peaking plant capacity 48.75 MW Gross - Net Power : To be confirmed at future date
A-19	Control System	No integration of control system (Electrical & I&C) between CCPP in Ukudu and DG Plant in Cabras; DG to have remote starting capability and GPA will provide communications to DG remote starting terminal.
A-20	Operator	KEPCO Responsibility
A-21	Fire Fighting System	KEPCO Responsibility
A-22	Level Difference	KEPCO Responsibility
A-23	Maintenance Area	KEPCO Responsibility