

**GOVERNMENT OF PUERTO RICO
PUBLIC SERVICE REGULATORY BOARD
PUERTO RICO ENERGY BUREAU**

NEPR

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IN RE:

GENERA PR LLC FUEL OPTIMIZATION
PLAN

CASE NO.: NEPR-MI-2023-0004

SUBJECT: Motion to Submit Genera's Revised
Fuel Optimization Plan in Compliance with
Resolution and Order dated July 18, 2023

**MOTION TO SUBMIT GENERA'S REVISED FUEL OPTIMIZATION PLAN IN
COMPLIANCE WITH RESOLUTION AND ORDER DATED JULY 18, 2023**

TO THE HONORABLE PUERTO RICO ENERGY BUREAU:

COMES NOW GENERA PR, LLC ("Genera"), as agent of the Puerto Rico Electric Power Authority ("PREPA"),¹ through its counsels of record, and respectfully submits and prays as follows:

1. On July 18, 2023, the Energy Bureau issued a Resolution and Order titled *Commencing Procedure to Evaluate GENERA PR LLC Fuel Optimization Plan* ("July 18th Order"), whereby, among other things, the Energy Bureau commenced Case No.: NEPR-MI-2023-0004 to review the Fuel Optimization Plan required by Section 4.2(t) of the LGA OMA and ordered Genera to file a final version, including a public version, of the Fuel Optimization Plan agreed upon with P3 Authority not later than August 15, 2023.

2. On August 14, 2023, Genera filed a document titled *Request for Extension of Time to Submit Fuel Optimization Plan in Compliance with Resolution and Order dated July 18, 2023*

¹ Pursuant to the *Puerto Rico Thermal Generation Facilities Operation and Maintenance Agreement* ("LGA OMA"), dated January 24, 2023, executed by and among PREPA, Genera, and the Puerto Rico Public-Private Partnerships Authority ("P3 Authority"), Genera is the sole operator and administrator of the Legacy Generation Assets (as defined in the LGA OMA) and the sole entity authorized to represent PREPA before PREB with respect to any matter related to the performance of any of the O&M Services provided by Genera under the LGA OMA.

(“August 14th Motion”) whereby Genera requested an extension of time of twenty (20) days, until September 4, 2023, to submit the finalized Fuel Optimization Plan.

3. On September 1, 2023, Genera filed an *Urgent Request for Extension of Time to Submit Revised Fuel Optimization Plan in Compliance with Resolution and Order dated July 18, 2023* (“September 1st Motion”). Through the September 1st Motion, Genera informed the Energy Bureau of the concerted efforts of Genera and the P3 Authority to finalize the revised Fuel Optimization Plan since the issuance of the July 18th Order. Additionally, Genera requested a supplementary request for an extension until September 15, 2023, to submit the finalized, revised Fuel Optimization Plan.

4. In compliance with the July 18th Order, and in accordance with the September 1st Motion, Genera hereby submits its revised Fuel Optimization Plan agreed upon with the P3 Authority for the approval of the Energy Bureau, attached as **Exhibit A** herein.

WHEREFORE, Genera respectfully requests that the Energy Bureau **take notice** of the above for all purposes and **deem that** Genera has complied with the July 18th Order.

RESPECTFULLY SUBMITTED.

In San Juan, Puerto Rico, this 15th day of September 2023.

ECIJA SBGB
PO Box 363068
San Juan, Puerto Rico 00920
Tel. (787) 300.3200
Fax (787) 300.3208

/s/ Jorge Fernández-Reboredo
Jorge Fernández-Reboredo
jfr@sbgblaw.com
TSPR 9,669

/s/ Alejandro López-Rodríguez
Alejandro López-Rodríguez
alopez@sbgblaw.com

TSPR 22,996

CERTIFICATE OF SERVICE

We hereby certify that a true and accurate copy of this motion was filed with the Office of the Clerk of the Energy Bureau using its Electronic Filing System.

In San Juan, Puerto Rico, this 15th day of September 2023

/s/ Alejandro López-Rodríguez
Alejandro López-Rodríguez

Exhibit A

Revised Fuel Optimization Plan



FUEL OPTIMIZATION PLAN

Draft submitted to PREB on September 15, 2023

Draft Form disclaimer

Please be advised that the information contained in this draft document is confidential and intended solely for discussion with the Puerto Rico Public-Private Partnerships (“P3 Authority” or “Administrator”) and the Puerto Rico Energy Bureau (“PREB”). If you are not the intended recipient, please notify Genera immediately and delete this document from your system. This document is a work in progress and is protected under commercial considerations. Any unauthorized use, disclosure, copying, or distribution of this document is strictly prohibited.

This disclaimer will be amended after the P3 Authority and PREB approve the document as final. Genera reserves the right to request PREB leave to produce a final public version of this document for public access and a sealed version that may only be accessed by the P3 Authority and PREB.

Disclaimer

The information provided in this plan is presented in accordance with the *Puerto Rico Thermal Generation Facilities Operation and Maintenance Agreement* ("OMA"), which was signed on January 24, 2023, by the Puerto Rico Electric Power Authority ("PREPA"), the Puerto Rico Public-Private Partnerships Authority ("P3 Authority" or "Administrator"), and Genera PR LLC ("Genera"). Additionally, this plan adheres to the requirements of the Puerto Rico Energy Bureau of the Public Service Regulatory Board ("PREB"), as outlined in the matter of In Re: Genera PR, LLC Fuel Optimization Plan with docket number NEPR-MI-2023-0004. For further information, please refer to <https://energia.pr.gov/en/dockets/?docket=nepr-mi-2023-0004>.

TABLE OF CONTENT

I. EXECUTIVE SUMMARY 6

II. STRUCTURE OF THE FUEL OPTIMIZATION PLAN 8

a.	Summary of Cost Savings Initiatives	9
b.	Process to Review the Fuel Optimization Plan	9
c.	Conflicts	10
d.	Fuel Optimization Report and Fuel Optimization Payment	10

III. FUEL ACQUISITION INITIATIVES – REDUCING TRANSPORTATION, TESTING, DELIVERY AND STORAGE COSTS 11

1.	INITIATIVE: REDUCE THE FIXED PREMIUM FOR ULSD	13
2.	INITIATIVE: FUEL RELIABILITY ENHANCEMENTS FOR ULSD	16
3.	INITIATIVE: CHANGE OF FUEL OIL ESCALATOR AND REDUCTION OF FUEL OIL ADDER	18
4.	INITIATIVE: ADDITIONAL ULSD ON-SITE RESERVE CAPACITY	22
5.	INITIATIVE: SPOT PURCHASE OPTION FOR FUEL OIL AND ULSD	23

IV. FUEL OPTIMIZATION INITIATIVES – PORTFOLIO OPTIMIZATION 25

6.	INITIATIVE: PRICE RISK MANAGEMENT	25
----	-----------------------------------	----

V. FUEL OPTIMIZATION INITIATIVES – CREDIT 32

7.	INITIATIVE: PAYMENT TERMS MANAGEMENT	32
----	--------------------------------------	----

VI. FUEL EFFICIENCY INITIATIVES 34

8.	INITIATIVE: FUEL EFFICIENCY PROJECTS	34
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ANNEX A 38

I. EXECUTIVE SUMMARY

PREPA's customers have experienced fluctuations in fossil fuel markets, resulting in increased fuel costs that are reflected in their monthly bills. As part of its role under the OMA, Genera is responsible for managing fuels for the Legacy Generation Assets and committed to presenting a plan to the Administrator and PREB that outlines the Fuel Cost Savings Initiatives and expected methods for achieving estimated fuel savings during the OMA's term.

This Fuel Optimization Plan outlines Genera's vision and strategy to improve the management of fuels consumed by the Legacy Generation Assets¹ on the island of Puerto Rico for fiscal year 2024 ("FY2024"). The three main objectives of this plan are to provide an increase in the reliability of the Legacy Generation Assets, optimize the use and consumption of fuels by the legacy Generation Assets and reduce the price of the associated fuels via specific and targeted fuel initiatives. The plan below provides specific details on multiple initiatives, how Genera will implement these initiatives and how these initiatives will be measured. These initiatives will be implemented in parallel with the overall improvement in reliability and efficiency of the Legacy Generation Assets in compliance with the Integrated Resource Plan.² The initiatives herein proposed will reduce the costs that customers pay for fuel adjustments thus, alleviating their energy bill spending until the diversification of generation technologies, led by renewable resources, is materialized.

Genera will achieve these objectives with the execution of these various Fuel Cost Savings Initiatives classified into three focus categories starting in FY2024:

¹ Pursuant to the *Puerto Rico Thermal Generation Facilities Operation and Maintenance Agreement* ("OMA"), dated January 24, 2023, executed by and among PREPA, the Puerto Rico Public-Private Partnerships Authority ("P3 Authority" or "Administrator") and Genera, Genera is the sole operator and administrator of the fossil-fueled base-load generation plants and combustion turbine peaking units owned by PREPA (the "Legacy Generation Assets" or "LGA").

² Any capitalized terms that are not defined will be given the meaning provided to them in the OMA.

FUEL ACQUISITION INITIATIVES – REDUCING TRANSPORTATION, TESTING, DELIVERY AND STORAGE COSTS

Fuel Acquisition Initiatives focus on reducing transport, testing, delivery and storage costs of existing fuels within the current portfolio, which are: liquified natural gas (“LNG”), heavy fuel oil (commonly referred to as “Bunker C”) and ultra-low sulfur diesel (“ULSD”). These initiatives will incorporate various forms of infrastructure optimization projects, including logistics-related market negotiations and modifications to subsequent requests for proposals (“RFPs”) that will achieve dollar cost savings and generation production reliability. The main Fuel Acquisition Initiatives are:

- Reducing ULSD Adder
- Incorporate ULSD fuel-reliability enhancements
- Change the Fuel Oil Escalator and Reduce Fuel Oil Adder
- Additional on-site Storage

FUEL CREDIT AND PORTFOLIO OPTIMIZATION INITIATIVES

These initiatives incorporate risk management strategies and tools focused on mitigating volatility across the fuels portfolio and providing better protection against fuel price fluctuations. Genera will introduce price-risk management with a conservative approach over the coming months and years, as the history of this concept has been marked by skepticism and highly criticized for its failure to contribute to lower fuel prices. The following Fuel Optimization Initiatives are:

- Market-Price Risk Management
 - Backwardation / Contango Market Structures
 - Futures Market-Price Caps
 - Futures Market Options
- Credit Risk / Payment-Term Management

FUEL EFFICIENCY INITIATIVES

Fuel Efficiency Initiatives focus on improving the efficiency of the Legacy Generation Assets by making improvements to the plants themselves. These engineering projects will include a wide-ranging level of tasks from simply fast-forwarding the implementation of delayed maintenance work to the replacement of certain critical pieces of infrastructure or to the investment into various technologies capable of improving the overall output of the generation units until they are replaced by other generation technologies, like renewable and storage sources. The primary aim of these projects is not only to enhance fuel efficiency but also to provide reliable power to customers until the fossil-fuel fleet is retired in accordance with the Integrated Resource Plan.

II. STRUCTURE OF THE FUEL OPTIMIZATION PLAN

Every initiative detailed throughout this Fuel Optimization Plan is organized in the following manner:

- **History and Background**
This section will provide some historical background on how this area has been managed to set the baseline for the newly adopted strategies in the following section.
- **Approach and Strategy**
This section will outline Genera's specific strategies for adopting the initiative to save on fuel costs.
- **Methodology Used to Determine Estimated Savings**
This section provides a methodology for calculating cost savings for the specific initiative. These methodologies will be different across specific initiatives and could also change and be different over different time horizons for a specific initiative.
- **Estimated Cost Savings**
This section provides estimated cost savings for the year the initiative is projected to be implemented.

- Implementation Timeline

This section provides a timeline of implementation for when the strategies associated with the initiative will be executed.

a. Summary of Cost Savings Initiatives

Below is a summary of all cost savings initiatives within each category, the estimated timing of implementation, and estimated dollar savings per fiscal year.

GENERA PR FUEL OPTIMIZATION PLAN - ACQUISITION / OPTIMIZATION AND EFFICIENCY INITIATIVES						
CATEGORY	INITIATIVE	FY2024	FY2025	FY2026	FY2027	FY2028
Fuel Acquisition	REDUCE THE FIXED PREMIUM FOR ULTRA LOW SULFUR DIESEL (ULSD)	\$10	\$2	\$2	\$2	\$2
Fuel Acquisition	FUEL RELIABILITY ENHANCEMENTS FOR ULSD	\$6	\$1	\$1	\$1	\$1
Fuel Acquisition	CHANGE FUEL OIL ESCALATOR AND REDUCE FUEL OIL ADDER	\$3	\$3	\$3	\$3	\$3
Fuel Acquisition	ADDITIONAL ULSD ON-SITE RESERVE CAPACITY	\$0.13	\$0.13	\$0.13	\$0.13	\$0.13
Fuel Optimization	PRICE RISK MANAGEMENT		\$5	\$10	\$20	\$20
Fuel Optimization	CREDIT RISK / PAYMENT TERM MANAGEMENT		\$2	\$6	\$8	\$8
Fuel Efficiency	FUEL EFFICIENCY INITIATIVES	\$8.2	\$16.4	\$16.4	\$16.4	\$16.4
TOTAL ESTIMATED SAVINGS FOR ALL INITIATIVES		\$27.3	\$29.5	\$38.5	\$50.5	\$50.5
	Evaluation / Planning Phase	* All estimates are in million dollars.				
	Partial Implementation					
	Active Cost Savings Initiative					

b. Process to Review the Fuel Optimization Plan

This Fuel Optimization Plan may require modifications from time to time. Genera anticipates new initiatives and modifications of existing initiatives that will be introduced to the stakeholders and regulators throughout the life of the OMA. All reviews will be made in accordance with Section 4.2 (t) of the OMA and PREB orders.

Given the fuel market and its worldwide reach and volatility, during the first Contract Year, Genera may identify opportunities to adjust the scope or implementation of these programs on a trial basis to evaluate the effectiveness in cost-reducing even further. Upon a determination by Genera of a cost reduction opportunity within the term of any fiscal year, the changes

or modifications to the Fuel Optimization Plan shall be submitted to the Administrator and PREB for approval.

c. Conflicts

Any disagreements between Administrator and Operator regarding this Fuel Optimization Plan will be resolved pursuant to Section 4.2 (t) of the OMA.

d. Fuel Optimization Report and Fuel Optimization Payment

This Fuel Optimization Plan and the methodologies for calculating Actual Fuel Savings detailed herein will serve as the basis for Genera's annual Actual Fuel Savings calculations and the resulting Fuel Optimization Payment. Genera will present this information in a detailed Fuel Optimization Report, pursuant to Annex II, Section III (B)(6) of the OMA. The latter will also be followed to submit requests for payment of the Fuel Optimization Payment.

III. FUEL ACQUISITION INITIATIVES – REDUCING TRANSPORTATION, TESTING, DELIVERY AND STORAGE COSTS

Introduction

Liquid fuels and natural gas are the two categories of fuel used for power generation in the Legacy Generation Assets. LNG, transported and supplied in its liquid form, is used at two locations: San Juan and Costa Sur power plants. Heavy fuel oil is used in San Juan, Palo Seco, Costa Sur and Aguirre Steam Plants. Lastly, ULSD is used as backup fuel in the four steam plants mentioned above and all emergency generation units across the Island.

Historically, PREPA purchased fuels using the general price concept of:

$$\text{final price} = \text{escalator} + \text{fixed premium} + \text{applicable taxes}$$

The escalator, sometimes referenced as price postings, will fluctuate up or down with the international oil price. To minimize the impact of price volatility of the international oil market in the final price of liquid fuels, changes to the reference price postings (escalator) must be evaluated to reduce basis and arbitrage risk. That is, by using a reference posting that better represents the market and the quality of the product being acquired, less volatility and dislocation of prices will occur. Note that price movement, including escalation in relation to the international price of oil, is unavoidable to a large degree. Some type of price risk management could be implemented to cap or minimize such escalation but at a certain cost (more on this subject in Section 10).

The fixed premium is affected mainly by intrinsic and extrinsic factors. The main intrinsic factor is the logistics costs associated with transport to the LGA sites. Supplying the required amount of fuels, at its mandated quality, to all the generation facilities has been challenging throughout the years due to logistics constraints, such as the limited receiving capacity of reserve tanks and restricted navigation capacity at receiving ports and docks. The need for a large storage terminal to receive medium capacity vessels (break bulk) and an ocean-going, US flag, dedicated barge for deliveries to the plants is a fixed

cost that can only be recovered via the fixed premium. Optimizing key elements of the logistics chain is needed to ensure a reliable supply of liquid fuels, which in turn could result in fuel cost savings. Changes to the acquisition process and the final supply contracts are necessary to achieve said improvements.

Extrinsic factors affecting the fixed premium are mainly:

- international freight rates,
- arbitrage and basis risk between the index price and the reference posting, quality differentials,
- credit risk,
- payment terms (cost of working capital),
- insurance and
- bonds

Factors affecting the escalator and the fixed premium are further discussed in the following sections and the corresponding optimization initiatives.

1. INITIATIVE: REDUCE THE FIXED PREMIUM FOR ULSD

a. Introduction and Background:

As part of the preparations for the new State Implementation Plan (“2022 SIP”) submitted by the Government of Puerto Rico to the Environmental Protection Agency (“EPA”) in the winter of 2022, PREPA changed the quality of most of the diesel being contractually acquired from high and low sulfur diesel to ULSD for all generation plants. Palo Seco was the only plant requiring ULSD before the 2022 SIP. The expedited negotiations with the current diesel supplier, at that moment Novum Energy Trading, to change contractual specifications to the ULSD resulted in a significant increase in fixed premium of almost \$3.00/bbl effective in July 2022 to the end of the existing contract in November 2022, which was extended by mutual agreement to November 2023.

b. Approach and Strategies:

The reduction of the fixed premium for ULSD will occur annually during each year’s RFP for new fuel suppliers. A new ULSD RFP for FY2024 is ongoing, with active negotiations underway with two potential suppliers. Even with fuel reliability enhancements (see initiative 2 below), a new fixed premium is estimated to materialize in the \$2.75–\$3.00 range of savings per barrel. Genera will target additional optimization initiatives in future ULSD RFPs. These initiatives include but not be limited to (1) an increase in the number of potential bidders to create a more competitive bidding process, (2) Genera taking more control of the overall logistics chain (see initiatives 6, 7 & 8 below) and (3) Genera evaluating the adoption of additional on-site ULSD storage (see initiative 5 below).

c. Methodology used to determine estimated savings:

The methodology used for estimated cost savings for the reduction of the ULSD fixed premium will be as follows:

- The FY2024 methodology will compare the then-current fiscal year ULSD premium (FY2023 contract) to the new negotiated

number for FY2024 based upon the then-annualized volume of ULSD consumption across the generation system while the supplier's contract is in effect (estimated date is November 17, 2023, until November 16, 2024). For example, the FY2023 ULSD premium is set at \$10.60, with the FY2024 potential ULSD premium set to be somewhere around \$7.75 per barrel. The value difference equates to an estimated savings of \$2.85 per barrel consumed during the FY2024 supplier's contract date range (November 17, 2023 to November 16, 2024). At the end of the supplier contract year, Genera will submit to PREB the following example calculation for review and approval (See subsection (d) below for calculations on estimated savings for FY2024):

- Annualized ULSD volume consumed during supplier contract (November 17, 2023 to November 16, 2024):
1,000,000 barrels
- Cost savings from new supplier adder: \$2.85
- $\$2.85 * 1,000,000 = \$2,850,000$ savings during FY2024 for this initiative

Thus, the formula to calculate the savings is:

FY2023 total premium paid – FY2024 total premium paid

d. Estimated cost savings:

Using the methodology described above in subsection (c), the estimated savings from FY2024 ULSD premium is estimated to be \$2.85 per barrel (FY2023 of \$10.60 – FY2024 of \$7.75 = \$2.85 per barrel). Based upon the estimated volume of ULSD consumed during the FY2024 supplier's contract effective dates (estimated to be November 17, 2023 to November 16, 2024), the following table represents a range of the estimated dollar savings arising from the FY2024 reduction of the ULSD premium. The targeted range is wide due to the unknown ULSD demand.

ULSD Estimated Cost Savings @ \$2.85 per barrel					
Estimated Volume in BBLs	2,000,000	2,500,000	3,000,000	3,500,000	4,000,000
Estimated Reduction in Adder	\$ 2.85	\$ 2.85	\$ 2.85	\$ 2.85	\$ 2.85
Estimated Annualized \$	\$ 5,700,000.00	\$ 7,125,000.00	\$ 8,550,000.00	\$ 9,975,000.00	\$ 11,400,000.00

Estimated total savings for FY2024 by reducing the ULSD premium is projected to be around \$8.5 million to \$10 million in savings.

Estimating cost savings for the future reductions of the ULSD premium will occur annually once the start of the future RFP has commenced. The communication of these future cost savings, if any, will be a part of the annual update of the Fuel Optimization Plan.

e. Implementation Timeline:

The implementation of the FY2024 reduction of ULSD premium will be for one year starting on November 17, 2023 or as soon as awarded supplier first sells a barrel to Genera, and until the expiration of the FY2024 ULSD supplier contract on November 16, 2024. Future RFPs should follow similar timing as the RFP process occurs once a year.

2. INITIATIVE: FUEL RELIABILITY ENHANCEMENTS FOR ULSD

a. Introduction and Background:

In November 2022, upon agreeing to extend the current ULSD supply agreement with a supplier, PREPA requested said supplier bring, at PREPA's full cost, a second barge of 50,000 bbls capacity to enhance distribution capabilities for diesel to all plants. This redundancy was needed primarily because the existing supply contract did not impose on the supplier the obligation to have a minimum stock reserve, especially during emergencies, nor the commitment to have a barge in Puerto Rico of a reasonable capacity to operate during normal and emergency periods. Historically, due to unforeseen supply disruptions, PREPA was forced to initiate diesel curtailments into one or more of the plants. The solution to this problem was to bring and pay for a second barge as a contingency.

b. Approach and Strategies:

An additional savings consideration for the FY2024 ULSD RFP premium is the removal of the use of an additional barge currently under operational control by the FY2023 supplier, Novum. Genera is implementing two specific changes in the current ULSD RFP for FY2024 to strengthen and achieve more control in the supply chain logistics, which should guarantee a more reliable and consistent supply of ULSD to all plants. The changes include (1) an increase in the minimum stock reserve to the amount of an additional 50,000 barrels of working capacity for Genera to call on in times of estimated heavier-than-normal ULSD demand and 2) a requirement that the supplier uses a minimum size barge (45,000 – 50,000 barrels) to optimize marine deliveries into all plants capable of receiving ULSD via water.

c. Methodology used to determine estimated savings:

The methodology used for estimated cost savings for fuel reliability enhancements will be as follows:

- Compare the actual cost of the barge from December 2022 to November 2023 to not having to pay for the use during the FY2024 ULSD contract.

d. Estimated cost savings:

The additional barge costs Genera an estimated \$6.2 million per year. By removing the need for the second barge, mainly due to Genera's negotiated reserve stock and minimum barge requirements mentioned above in subsection (b) of this section, the FY2024 plan for ULSD will save an additional \$6.2 million.

Estimated total savings for FY2024 by reducing the ULSD premium is estimated to be around \$6.2 million in savings.

e. Implementation Timeline:

The fuel reliability enhancements will be implemented after the execution of the FY2024 ULSD RFP.

3. INITIATIVE: CHANGE OF FUEL OIL ESCALATOR AND REDUCTION OF FUEL OIL ADDER

a. Introduction and Background:

Historically, PREPA maintained an escalator for fuel oil purchases that was quite representative of the international price of fuel oil for the quality that PREPA was purchasing. In the 1980s and 1990s, PREPA was buying fuel oil of 2.0% maximum sulfur for Aguirre, and San Juan and Palo Seco; and 1.5% for Costa Sur. Price escalators for these fuels were the Platts Oilgram Report³ New York Harbor (NYH) 1.0% and 2.2% sulfur postings interpolated to the respective maximum sulfur for the specific generation plant. (i.e., 1.5% and 2.0%, as mentioned above). The NYH 1.0% sulfur posting was a widely used, very liquid posting traded at significant daily volumes, making this posting a reliable and efficient indicator of price for medium sulfur fuel oils in the region. Although postings for other regions were available (i.e., there was also a 1.0% sulfur posting for the US Gulf Coast), PREPA chose to continue using the NYH postings due to (a) its larger liquidity and (b) NYH was the largest importer/buyer of 1.0% sulfur fuel oil in the region while the US Gulf Coast was a net exporter.

In the early 2000s, the mandated sulfur specification for all fuel oil generation units was reduced to 0.5% sulfur. PREPA was then forced to change the escalator to the Platts NYH 0.7% and 0.3% sulfur interpolated to 0.5% sulfur. Although this new escalator was quite effective in tracking the value of sulfur of the new low sulfur fuel oil ("LSFO"), the respective postings of 0.7% and 0.3% were not as liquid and heavily traded as the prior 1.0% posting once was. It's worth noting that LSFO was only consumed in the Northeast region of the US, thus reducing its daily consumption and trading volume.

In 2020, the International Maritime Organization ("IMO") changed the worldwide sulfur specification for all bunker (marine) fuel oils. In the 3rd quarter of 2021,

³ Platts Oilgram Report is an independent publication of worldwide international oil prices published daily by Platts, a S&P Global Company.

Platts announced that it would discontinue publishing the NYH 0.7% and 0.3% sulfur postings effective December 31, 2022, due to low demand and traded volume, and instead would post a single 0.5% sulfur posting for all fuel oils based on the underlining market of marine fuel oils used for bunkering in the NYH. PREPA now uses the Platts NYH Marine 0.5% sulfur posting as the escalator for fuel oil.

This new escalator suffers from two significant deficiencies as an accurate escalator for 0.5% sulfur fuel oil used for power generation. First, the postings reflect only the volume of 0.5% sulfur fuel oil traded in the NYH for marine fuels, which is a relatively more minor volume than power generation used to be. It must be noted that LSFO used for power generation in the New York and Northeast region is almost nonexistent due to environmental regulations and the increase of natural gas as the preferred fuel. Second, it reflects volumes traded in smaller parcels (1000–3000 metric tonnes) of marine fuel sales as opposed to the typical 50,000 metric tonnes parcels used for power generation by PREPA. More importantly, the low volume of trading makes this posting vulnerable to significant volatility and even a certain degree of manipulation by market participants, even for brief periods.

b. Approach and Strategy:

Since almost all fuel oil volumes traded in the international oil market are done based on the more liquid, more transparent postings for crude oil, changing the escalator for the fuel oil purchases to a crude oil posting reference will achieve cost savings. Specifically, switching to a crude oil escalator will achieve cost savings by:

- The new crude escalator should be more accurate in terms of prices for large-scale utilities consuming fuel oil compared to a very small Northeast US fuel oil utility market;
- Allow for suppliers or Genera to more accurately manage the price risk of fuel oil because current fuel oil price escalator (Platts .5%) has limited forward price discovery (these savings could show up in a supplier's reduced adder and via Genera's

price risk management program, see price risk management section, initiative 10 below for further details); and

- Reduce the volatility of the escalator and subsequently reduce the opportunity for targeted price spikes due to manipulation or limited liquidity that have often occurred in the current pricing escalator.

Upon evaluating the various available crude oil postings that better reflect the value of LSFO, Brent Crude Oil appears to be a better choice to change to for the future escalator for fuel oil. All major components used by potential suppliers for blending IMO and power generation that consumes LSFO are traded basis Brent. For example, straight-run feedstocks, ultra-low sulfur cracked fuel oils, viscosity reducers and even Brazilian LSFO is traded based on Brent crude oil posting references.

c. Methodology used to determine estimated savings:

Various methods will be utilized to assess cost savings by retrospectively reviewing the fiscal year's end. These are:

- Direct comparison of all fuel oil purchases for FY2024 using the awarded supplier's reported escalator + adder for the two posting references below (note each price escalator will have its own unique adder provided by each supplier):
 - a. Platts 0.5% + adder1
 - b. Brent Crude + adder2
- A second methodology for cost savings will be attributed to using Brent crude in our price risk management strategies as a more efficient and liquid price risk management instrument. Initiative 5 listed below provides the specific cost savings methodologies.

d. Estimated cost savings:

At the time this plan is being presented to PREB, it is not possible to determine the actual FY2024 savings for the comparison of the Brent vs. Platts actual pricing. A high-level estimated cost savings for the direct comparison of flat price (the Brent + adder1 to the Platts + adder2) is around \$0.25 to \$0.75 per barrel. An example for a reduced-price using Brent + adder1 vs. Platts + adder2 using 12 million barrels of expected fuel oil consumption is:

- $\$0.25 * 12,000,000$ barrels of fuel oil = \$3,000,000 savings

Total estimated savings for this initiative for FY2024 are \$3 to \$9 million.

e. Implementation Timeline:

Genera anticipates implementing this change during the FY2024 Fuel Oil RFP but will require feedback from the market before confirming that timing since Genera will need the awarded supplier to respond with both posting references. If the change is not implemented during the FY2024 RFP, Genera anticipates adopting it in the FY2025 Fuel Oil RFP.

4. INITIATIVE: ADDITIONAL ULSD ON-SITE RESERVE CAPACITY

a. Introduction and Background:

Except for Aguirre, all plants lack sufficient diesel capacity to guarantee consistent and reliable operation. In the case of Cambalache, additional diesel capacity is required to ensure fuel availability for the existing units and any potential future temporary generation that may get installed.

b. Approach and Strategy:

Tank D-2 in Cambalache, with a capacity of 82,000 barrels, is currently out of service. By returning this tank to service, Genera will maintain enough reserve stock to ensure the operation of all units, even during extended marine weather limitations or natural disasters. By doing this, Genera will avoid requiring deliveries via truck at an estimated additional cost of \$1.00 per barrel.

c. Methodology used to determine estimated savings:

Use the average quantity of fuel delivered to Cambalache via truck from 2020-2023 due to weather limitations for marine deliveries and/or unplanned emergency demand of the Cambalache units, multiplied by the additional truck delivery cost (over barge delivery) of \$1.00/bbl. Additional savings are anticipated due to the avoidance of truck diesel deliveries to other peaking units to compensate for the potential loss of generation in Cambalache, but these are more difficult to estimate, and thus, they are not included herein. All savings will be first used to repay the initial capital investment before being considered for Actual Fuel Savings purposes.

d. Estimated cost savings:

The figure below shows the quantity of diesel delivered to Cambalache from 2020 to 2023 YTD. On average, 132,681 barrels of diesel were delivered annually via truck. This would represent savings of approximately \$133,000 per fiscal

year. All savings will be first used to repay the costs of returning the tank back to service before being considered for Actual Fuel Savings purposes.

<i>Year</i>	<i>Qty bbls</i>	<i>Final Amount</i>
2020	306,390	\$20,452,593.16
2021	130,838.73	\$14,192,262.85
2022	76,957.59	\$12,523,706.81
2023	16,536.90	\$2,139,456.63
Average	132,681	\$ 12,327,004.86

e. Implementation timeline:

This initiative will be implemented during the second half of FY2024 to the start of FY2025.

5. INITIATIVE: SPOT PURCHASE OPTION FOR FUEL OIL AND ULSD

a. Introduction and Background:

Explicit in both Fuel Oil and ULSD contracts is a clause that allow for Genera to purchase up to 25% of the estimated fuel for the given contract year. If Genera finds fuel at a lower price than what is offered in the supplier's contract (Article I, Section B(I) for both Fuel Oil and ULSD contracts), then Genera can purchase lower cost fuel.

b. Approach and Strategy:

Throughout the contractual year for a specific fuel, Genera will continue to monitor the market for spot fuel purchases. If during that year Genera identifies another market willing to sell ULSD or Fuel Oil of less cost than the contractual price of the current supplier, Genera will negotiate with that new supplier to purchase the specific fuel.

c. Methodology used to determine estimated savings:

Compare the new purchased fuel cost to the price of the contractual cost on the day of purchase (or an average over time if there are multiple purchase) and if the new purchase fuel acquisition cost is less than current contracted supply, that difference will be considered for cost savings. Example:

- Current Fuel Oil contract is Platts .5% + \$10 per barrel
- Spot Fuel Oil purchase opportunity is Platts .5% + \$5 per barrel
- All volume bought (up to 25% of annual Fuel Oil demand) * \$5 per barrel would be considered savings in this example

d. Estimated cost savings:

Unknown.

e. Implementation timeline:

This initiative will be implemented during FY2024.

IV. FUEL OPTIMIZATION INITIATIVES –PORTFOLIO OPTIMIZATION

6. INITIATIVE: PRICE RISK MANAGEMENT

a. Introduction and Background:

With the exception of isolated instances, PREPA did not consistently manage price exposure in the past. Attempts by PREPA to fix or cap the escalation of prices (moves in the international price of oil or “flat price”) have been repeatedly debated and questioned because of its interpretation as price speculation.

Deliveries of liquid fuels to Legacy Generation Assets are usually made in sizes that can sustain the plants for 5–10 days in Aguirre, and 15–20 days in San Juan, Palo Seco, and Costa Sur for fuel oil and diesel. For gas turbine generation stations (peakers), diesel deliveries are made in even shorter periods. This is due to the relatively small reserve capacity for liquid fuels.

Pricing periods for each delivery of fuel are based on the three-day average around the delivery date (typically depicted as -1, 0, +1 pricing days). Therefore, the average cost of fuel often corresponds to the average monthly flat price, rendering the use of intra-month hedging⁴ not effective and even unnecessary under normal circumstances.

Moreover, the use of the Fuel Charge Adjustment factor in the utility rate structure makes the ratepayer the *de-facto* counterparty of an implicit and very effective hedging mechanism for managing price exposure.

a. Approach and Strategies:

⁴ Hedging is a mechanism to manage price exposure using the commodity future financial markets when there is time (different pricing periods), quality (basis risk) and/or location (arbitrage).

The main objective for implementing this price risk management initiative is to manage commodity price volatility and provide stability to fuel prices throughout the year. Consulting services company Deloitte defines commodity price risk as *“the financial risk on an entity’s financial performance or profitability based upon fluctuations in the prices of the commodities that are out of the control of the entity due to external market forces.”*⁵

The following figure shows the key components of a price risk management program.



Due to the complexity of price risk management programs, understanding how to design and develop such a program for a complex web of entities such as a public-private partnership and the overall importance of gaining buy in from all stakeholders, Genera anticipates spending a significant time of FY024 in the initial development of the framework, policies, tactical strategies, audit & governance metrics and internal & external reporting of a price risk management program. This initial phase will ensure all stakeholders understand and approve of the overall risks and objectives of this important cost savings initiative. This initiative is still a work in progress, but Genera found it important to share the initial strategy on this first fuel optimization plan.

⁵ Deloitte & MCX, Commodity Price Risk Management: A Manual of Hedging Commodity Price Risk for Corporates (2018), available at <https://www2.deloitte.com/content/dam/Deloitte/in/Documents/risk/in-risk-overview-of-commodity-noexp.PDF>.

If an overall framework and price risk management program gets developed and approved in FY2024, there could be opportunities for cost savings. In the case of the Legacy Generation Assets and the portfolio of fuels used for electricity generation, Genera would implement certain price risk management strategies to reduce these fluctuations in prices compared to planned and budgeted costs. The tactical methodologies will be simple in approach at first and, if needed, further developed in complexity over time. Implementing a conservative approach to price-risk management will be key during the initial stage of Genera's management of the generation system. In large part, because the system is unstable in terms of generation fuel demand and reliability. Examples of Genera's initial strategies for managing price risk include a budget and time methodology. These strategies are defined as:

- Budget

This type of strategy is used to manage the price of fuel that was defined during a budgetary process. Certain price risk management instruments will be executed at the time of the budgetary process to fix a certain percentage of the forward price of fuel portfolio (note these numbers will be based upon reviewed, approved and auditable PROMOD our equal economic dispatch modeling result produced values). This will show the stability of fuel prices throughout the year since they will have been fixed at a certain level and any price increases will be abated. However due to the unknown demand of fuel for a given year, Genera considers reasonable to implement an approach in which no more than 30% of anticipated fuel demand is fixed at the start of a budgetary year. Limiting the amount of the fuel portfolio to 30% fixed provides a greater level of certainty that you don't run the risk of overbuying a certain fuel. As mentioned above, these tactical strategies will be further refined throughout FY2024 as Genera finalizes the price risk management framework.

- Time

This type of strategy is used to manage the price of fuel on a volumetric basis, meaning by some date in time, a certain percentage of the anticipated fuel demand will be price risk managed

(or hedged) at a certain price. The following is a detail of a potential example.

1. Before the start of any quarter, 25% of that quarter's estimated total fuel demand must be hedged 45 days prior to the start of the quarter. Example for Q4-2023 (illustrative purposes only):
 - a. Estimate 3,000,000 barrels of fuel oil / 900,000 barrels of ULSD and 18 TBtu of natural gas are expected to be consumed during Q4-2023
 - b. Starting 45 days prior to October 1, 2023, if no volume has been price risk managed "hedged" up to this point, this strategy would implement a mandate hedge for 25% of each of the fuels within the fuel portfolio (750,000 barrels of fuel oil, 225,000 barrels of ULSD and 4.5 TBtu of natural gas) at best achievable pricing.

The following risk management instruments would be used opportunistically to manage market price risk across the fuel portfolio utilizing a "Time" or "Budget" strategy described above.

- Futures Market - SWAPS (LNG, Fuel Oil and ULSD)

The use of swaps or price limits to temporarily set price caps could be utilized to control estimated increases in short-term fuel prices for budgetary purposes. The cost of said price caps could, at times, be expensive, especially now with the implied volatility of all the underlying generation fuels. Therefore, a careful analysis would be needed on a case-by-case basis. In this case, resulting cost savings must be limited to or expressed as fuel budget savings.
- Futures Contracts - Fixed Price (LNG, Fuel Oil and ULSD)

The use of futures contracts will also be used opportunistically to control estimated increases in short-term fuel prices for budgetary purposes. Buying fixed-price futures contracts provides more levels of guarantees across the portfolio and will be limited to a lower percentage of total volume due to the uncertainty of the generation

unit demand. This will change over time as the system becomes more reliable and the demand profile becomes more assured.

- Backwardation / Contango Market Structures – (Phys. Fuel Oil and ULSD decisions)

Due to limited reserve storage capacity at the plants and the continued forced outages of base generation units, Genera must consistently keep a high inventory in all reserve tanks. This exposes Genera to “market structure,” otherwise known as “contango” or “backwardation.” When the oil market structure is in contango, the future price of oil is higher than prompt prices resulting in a positive price exposure (i.e., the weighted average price will be lower than otherwise would have been if purchases were delayed to a future period). On the other hand, when the market structure is in backwardation, the future price of oil is lower than prompt prices resulting in a negative price exposure (i.e., the weighted average price will be higher than otherwise would have been if purchases were delayed to a future period).

Genera’s exposure to market structure could be managed using two methods: (1) managing end-of-the-month receipts and inventories or (2) hedging intra and inter-month future prices on the underlying price index (ULSD for diesel and Brent for fuel oil).

b. Methodology for Estimated Cost Savings:

The main methodology for estimating cost savings of any of the previously mentioned price risk management strategies will be to compare the budgeted price per barrel and the price per MBTU forecasted for fuel purchases to the actual hedged and fixed price per barrel and price per MBTU realized for a given time frame. The most appropriate time frame will be for each fiscal year.

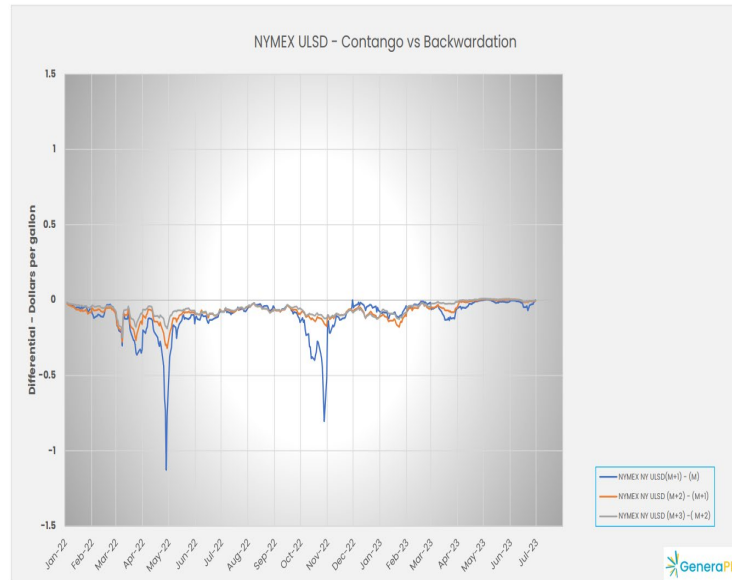
- Example: For FY2024, the prices budgeted for ULSD and fuel oil are set at \$119.28 per barrel and fuel oil at \$96.01 per barrel, respectively.

- One million barrels of ULSD was hedged at \$115 per barrel during various months of FY2024 (either by executing a future, swap, option or any of the previously mentioned financial or physical price risk management instruments).
- The cost savings in this example would be $\$119.28 - \$115 = \$4.28 * 1,000,000$ barrels for a total cost savings of \$4,280,000. *This is irrespective of where the market prices were on the day of physical delivery for the barrel in which the prices were hedged.*

Another methodology that will be used is one that will compare the structure of the underlying forward curve (“contango” or “backwardation”) to make decisions around physical end-of-month or beginning-of-month deliveries “purchases.”

- Example: In the Heating Oil structure below, a decision will be made to commence delivery at the start of August 2023 (\$2.9006 per gallon ULSD) vs. the end of July 2023 (\$2.9169 per gallon for ULSD). The decision to delay delivery until August would save an estimated \$0.016 cents per gallon / \$0.67 per barrel could be achieved by delaying that delivery.
- Note the second chart below showing Heating Oil contracts from January 2022 to June 2023 showing extreme periods of contango or, in this case, backwardation.

Commodity Futures Price Quotes For Heating Oil (NYMEX)					
(Price quotes for NYMEX Heating Oil delayed at least 10 minutes as per NYMEX)					
Also available: electronic Session Quotes					
Click for Chart	Open	High	Low	Last	Current Session Time
Cash	2.9169	2.9169	2.9169	2.9169	20:25 Jul 27
Aug'23	2.9006	2.9748	2.8862	2.9586	15:44 Jul 28
Sep'23	2.9017	2.9651	2.8777	2.9498	15:59 Jul 28
Oct'23	2.8839	2.9356	2.8552	2.9211	15:59 Jul 28
Nov'23	2.8283	2.8884	2.8184	2.8769	15:59 Jul 28
Dec'23	2.7799	2.8387	2.7759	2.8292	15:54 Jul 28
Jan'24	2.7620	2.8041	2.7549	2.7969	15:49 Jul 28
Feb'24	2.7361	2.7695	2.7242	2.7657	14:30 Jul 28
Mar'24	2.6912	2.7328	2.6893	2.7296	15:02 Jul 28
Apr'24	2.6569	2.6882	2.6547	2.6872	15:01 Jul 28
May'24	2.6351	2.6555	2.6254	2.6555	14:56 Jul 28
Jun'24	2.6058	2.6311	2.5977	2.6293	14:56 Jul 28



ESTIMATED COST SAVINGS:

Estimated savings for FY2025 and beyond are mainly dependent upon budgeted prices for each fuel versus market movements in the prices of those fuels during that specific fiscal year. A reasonable approach to estimating savings would be a 0.25% to 1% of the total notional value of the fuel budget (equivalent to \$0.25 to \$1.00 per barrel) that could be achieved annually using the previously mentioned price risk management methodologies and financial/physical instruments. FY2025 estimates would range from \$10 to \$20 MM dollars in estimated savings using the ranges defined above.

Total cost savings estimated for price risk management initiatives are estimated to be between \$5 million and \$20 million per year.

IMPLEMENTATION TIMELINE:

This initiative will be implemented during the second half of FY2024 through the first half of FY2025. During FY2024, the main focus will be on:

- Finalizing a framework and policy for the price risk management program and receiving approval from PREB
- Execute strategies mentioned above or further develop in the policy phase as soon as possible after receiving approval from PREB (estimate FY2024 / FY2025).

V. FUEL OPTIMIZATION INITIATIVES - CREDIT

7. INITIATIVE: PAYMENT TERMS MANAGEMENT

a. Introduction and Background:

Historically PREPA has paid high financing costs due to the market's view of the creditworthiness of the island. This is exacerbated by the fact that PREPA requires large amounts of credit (upwards of \$200 million on the fuel oil contract), and it has been requested that suppliers provide up to 60-day payment terms. These contractual requirements and the current state of the economy have led to high financing costs for all the liquid fuel supply. Most recent analysis shows that there are somewhere around 13% - 15% annualized financing costs for this credit.

b. Approach / Strategies:

Genera will endeavor to pursue all possible avenues available under the current fuels RFP framework to achieve better financing terms and reduce fuel premiums. Financing term improvements could be at Operator's own capital improvements. Fuel contracts will be renegotiated and extended or replaced as per government guidelines, with Genera acting as an intermediary providing increased access to the market.

c. Methodology for Estimated cost savings:

The methodology will be to compare suppliers' price offerings under the typical credit and payment terms determined by the RFP process (30 / 60-day terms

and various credit limits) and then see if those values will be lowered if the RFP allows for earlier payment terms and lower credit limits.

For example, during one of the RFP processes, a bidder provided the following 30-day and 60-day payment terms for fuel (the numbers have been changed, but the relative difference is the same):

- 30-day price was Escalator + \$10.00 per barrel
- 60-day price was Escalator + \$11.00 per barrel

Genera will seek secondary 3rd party financing options for a 30-day payment term, pay the fuel supplier in 30 days at \$10 per barrel (price premium if paid in 30 days), and if the secondary financing option is cheaper than \$1.00 per barrel for (\$11.00 - \$10.00) for another 30-day credit term, then there will be cost savings to share. Example:

- Product supplier's 30-day price is escalator + \$10.00 per barrel
- Additional financing option for 30-day is \$0.50 per barrel
- All in costs under this example for 60-day payment terms would be escalator + \$10.50 per barrel
- Under this example there would be \$.50 per barrel of savings for a 60-day payment term (\$11.00 adder under original supplier) - (\$10.00 adder under original supplier 30-day adder + 3rd party financing of \$0.50); $\$11.00 - \$10.50 = \$0.50$

d. Estimated cost savings:

Estimated savings for FY2025 are around \$.25 to \$.50 a barrel on the liquids fuel portfolio of 16 million barrels, with estimated annual \$ savings of \$4 million to \$8 million dollars.

e. Implementation Timeline:

This initiative will be implemented during FY2025, but there is a chance that this could be adopted during the FY2024 plan.

VI. FUEL EFFICIENCY INITIATIVES

8. INITIATIVE: FUEL EFFICIENCY PROJECTS

a. Introduction and Background:

In recent years, the investment in the maintenance of Legacy Generation Assets has been substantially reduced. This investment reduction includes the purchase of critical spare equipment, which has caused limitations and extended forced outages of generating units. The delivery time of this equipment is long, sometimes from 1.5 to two years of delivery. This has caused generating units to be unreliable, have operating limitations and a greater number of forced outages. In summary, of a total capacity of 4,528 MW in Legacy Generation Assets, only 2,102 MW is currently operational.

For this reason, Genera will implement a plan for aggressive repair and replacement of components of generating units plan and for an increase in preventive maintenance. The results of this plan will be seen by the People of Puerto Rico in two and a half years due to the lead-time of the critical equipment necessary to bring the units to acceptable reliability standards. The implementation of this maintenance, repair and replacement program for the generating units has its challenges since, currently, with the generation available, it is not possible to take a unit out of service for repair and meet the requirement of 675 MW of energy reserve.

The status of the Legacy Generation Assets before Genera commenced operations on July 1, 2023, is attached as **Annex A**.

b. Approach and Strategy

With the scheduled repair plan for generating units under Genera's administration, the units' heat rate, availability, frequency regulation and daily generation reserve will be improved.

Genera will implement an aggressive repair plan for the generating units and for increasing preventive maintenance. The benefits resulting from the repairs and maintenance should be best observed in approximately two and a half years due to the lead-time of the critical equipment necessary to bring the units up to date.

In these repairs, priority will be given to replacing critical equipment to maintain the units' availability and improve the efficiency of boilers, turbines, condensers and other equipment of the generation fleet.

Genera has identified close to fifteen pieces of equipment for urgent purchase to improve the availability of the units, such as cold and hot air heaters baskets, boiler feed pump bundles, various motors for fans and pumps, and others. Genera also identified the replacement of equipment to improve the efficiency of the units as feedwater heaters, steam coils, equipment for the continuous cleaning of the condenser, air heaters, soft start variable frequency motors, turbine distributed control system for improve the regulation of the units, gas turbine inlets chillers, water injection to gas turbine compressors, condenser and boiler leak corrections, more use of natural gas and others.

Genera's scheduled turbine repairs, which involve changing high- and low-pressure turbine rotors, can realize an increase in turbine efficiency that translates into significant savings in fuel costs. These repairs, together with healthy preventive and corrective maintenance, will lower costs and the frequency of forced outages.

All Capital Improvement Projects have been cost estimated using a ROM "Rough Order of Magnitude" of +/- 50%. Genera continues to refine these project cost numbers to appropriate design and construction level estimates (+/- 10% estimates for costs and timing) prior to executing on any capital improvement project. During this capital refinement phase, funding will be evaluated from two different sources:

1. Federally funded portfolio (i.e., FEMA, CWA State Revolving Funds).
2. Non-Federally funded portfolio (operating budget)

Once a project plan's have been complete (costs, timing, funding sources and all required approvals), the project will go through a delivery and implementation phase. Upon completion of the capital project, all capital savings will be prioritized to the source of the capital first ("Capital Recovery Fee"). In the case of "Non-Federally" funded projects, capital will be returned to the source of funds for the specific capital project first and only after those funds are returned to the original source will cost savings be considered for the purposes of Actual Fuel Savings. In the case of "Federally Funded" projects, capital will be available for Actual Fuel Savings immediately upon implementation of the capital investment project and will not require the capital to be returned first to the federal source. Genera PR currently estimates most of the capital projects to be multiyear in nature and the Capital Recovery Fee and the capital savings fees will be distributed on varying time horizons depending upon the actual capital improvement project.

c. Methodology Used to Determine Estimated Savings

The detailed methodologies and timeline used to determine estimated savings for fuel efficiency projects are outlined in the matter of *In Re: Annual Performance Test Procedure – Thermal Generation Equipment* with docket number no. NEPR-MI-2023-0003 that was filed on June 20, 2023 and its still pending PREB approval. Genera's proposal is still subject to PREB's approval. In general, the proposed methodologies consist of:

- Comparing the thermal efficiency of the units in fiscal year 2023-2024 and comparing it with the thermal efficiency of the following fiscal year 2024-2025, and so on year after year. It will also compare the frequency regulation, the forced departures of units, and compliance with preventive and corrective maintenance of the units in the fiscal year 2023-2024 and compare with the

following fiscal year 2024–2025. FY2025 methodology will compare FY2025 negotiated premium to FY2024 negotiated premium.

- Maintain corrective and preventive maintenance metrics and improve them.
- Annual Boiler and Turbine Overall efficiency measures evidenced by Performance tests with external personnel.
- Maintain corrective and preventive maintenance metrics and improve them.
- Annual Boiler and Turbine Overall efficiency measures evidenced by Performance tests with external personnel.

d. Estimated Cost Savings

Using the methodology described above, bringing into service heaters 6 and 7 should generate approximately \$500K per month in fuel savings at each unit based on a 311 MW load and \$11.5/MMBTU cost at Costa Sur units 5 and 6, or 12 million dollars annually for both units. The increase in fuel flow due to the lack of heaters causes an increase in the volume and temperature of gases. This could aggravate the problems in the air heaters. It is estimated that for every 10 °F in the exhaust, the Heat Rate is affected by 0.25%.

In the case of the use of variable frequency drives in the Boiler, and feedwater pumps in Costa Sur 5 and 6, the annual fuel savings due to savings in the consumption of auxiliaries is **\$16,477,244**.

Turbine repairs greatly improve the efficiency of the units. As an example, correcting the steam path of turbines 5 and 6 of Costa Sur of 410 MW each brings fuel savings of \$17,606,280 per year in each unit.

e. Implementation Timeline

This initiative will be implemented by Genera in FY2024 and until all the repairs and replacement of components are finalized.

Annex A

The status of the Legacy Generation Assets as of June 5, 2023, *before* Genera began operations:

Costa Sur 5 and 6 (820 MW total)

1. Costa Sur 5 (410 MW) – Limited to 203 MW

- Load limitation due to turbine vibrations bearing 1 and 2, between 6-7 mils, bearing 9 (Boiler Feedwater pumps, BFWP 5-1, 9 mils)
- Lack of motorized BFWP 5-2 (Needs 2 BFWP for unit total capacity)
- Hot well recirculating valve is out of service
- Air flow problems caused by ash-clogged air heaters due to fuel contaminated with plastic pellets and other substances, like Paraffin
- BFWP pneumatic control recirculation valves not in service (valves operated manually)
- High-pressure feed water heaters 6 and 7 not operating because they have many broken tubes (affecting boiler efficiency)
- Condenser circulating water pumps (CCWP) motors – Five motors have short-circuited in the last seven months. All five motors were repaired by Cortes Industrial, the only vendor on the island that repairs motors above 500 HP.
- Various boiler feed pump (BFP) failures: BFP 5-2 out of service without spare parts, BFP 5-1 in service with over 9 mils vibration, mx 5 mils permitted), Lack of BFP internal parts bundle. These failures present unit limitations and possible causes of force outages.

2. Costa Sur 6 (410 MW) – Limited to 250 MW

- Operating on only one CCWP
- High-pressure feed water heaters 6 and 7 are not operating because they have many broken tubes (affecting boiler efficiency)

Additional Notes for Cost Sur:

- To increase efficiency and lower energy costs, four high-pressure feedwater heaters in both units should be replaced.
- Costa Sur has problems with two BFP without spare parts and without a replacement bundle.
- Various motors with problems without spares in Costa Sur: CCWP Units 5-6, Vertical Motor 1000HP, Condenser Pump Vertical Motor, BCWP Vertical Motor 700HP; BFP Horizontal Motor 4500HP UNITS 5-6, Horizontal Motor 1750HP IDF UNITS 5-6.
- To improve condenser efficiency, vacuum a Continuous Cleaning System is needed

3. Palo Seco 3 and 4 (432 MW total)

Palo Seco 3 (216 MW / limited to 130 MW) / Palo Seco 4 (216 MW / limited to 150 MW)

- Load Limitation in both units due to airflow problems caused by ash-clogged air heaters
- Broken hydrogen coolers without spare. Unit 4 has an isolated cooler with generator temperature limitations and limited reactive power.
- Broken turning gear mechanism without spare (Unit 4).

4. San Juan Plant

San Juan 5 and 6 (440MW total)

- Load limitation (steam turbine condenser vacuum problem)

CTG 5	150 MW
STG 5	47 MW
CTG 6	155 MW
STG 6	54 MW
CC SJ	406 MW

San Juan 7, 8, 9 and 10 (400 MW total; 100 MW each)

- All units are out of service
- Need to repair pipe-type cable (output transmission line)

- Problems with the main power transformer Unit 10 and the emergency transformer Units 7 and 8
- If units 8 and 10 will not operate in the future (both units have problems with the boiler tubes and may not be cost-effective to repair), an option would be to use the turbine rotor, generator rotor and diaphragms as spare parts for Units 7 and 9

5. Aguirre 1 and 2 (900 MW total)

Aguirre 1 (450 MW)

- Out of service
- Generator failure needs rewinding
- CCWP motors also cause limitation

Aguirre 2 (450 MW)

- Limited to 325 MW
- Main steam line (MSL) fatigue problems, PREPA repair multiple cracks that have a crystalized welding and adjust the MSL hangers
- Unit 2 uses a CCWP motor from Unit 1 because Unit 2 has no functional motors.
- Condenser vacuum problems (24.5 HG mm.)

6. Aguirre Combined Cycle (592MW)

- Only 198 MW is currently operational for different reasons (Generator failure, output transformer failure, problems with the Steam Turbine, GT hot gas path inspections, etc.)

Aguirre Stag 1	MW
Gas 1 Available	50
Gas 2 Available	48
Gas 3 Out of Service	0
Gas 4 Out of Service	0
STG 1 Out of Service	0
Total Del Sitio	0

Aguirre Stag 2	MW
Gas 1 Out of Service	0
Gas 2 Out of Service	0
Gas 3 Available	50
Gas 4 Available	50
STG 1 Out of Service	0
Total Available	198 MW

- **Cambalache Power Plant 247 MW (Available 156 MW)**

Unit Name	Fuel	Nameplate Capacity (MW)	Status as of November 2023
Cambalache Unit 1	Oil No. 2	82.5	Irreparable Unit
Cambalache Unit 2	Oil No. 2	82.5	Operational
Cambalache Unit 3	Oil No. 2	82.5	Operational

- **Mayaguez Power Plant 220 MW**

- Only 105 MW operating due to various limitations
- Unit 2A is out of service, Unit 2 is limited to 20 MW and Unit 3B is limited to 30 MW

Mayaguez 220 MW	
Gas 1	55 MW
Gas 2	55 MW
Gas 3	55 MW
Gas 4	55 MW

- **Peakers (477 MW Total Nameplate capacity)**

Palo Seco (213 MW total)	
1. GT 1-1	21
2. GT 1-2	21
3. GT 2-1	0
4. GT 2-2	0
5. GT 3-1	0
6. GT 3-2	0
Mega Gen 1	27
Mega Gen 2	27
Mega Gen 3	27
Total Palo Seco	123
Jobos (44 MW total)	
GT-1	0
GT-2	18
Total Jobos	18
Daguao (44 MW total)	
GT-1	20
GT-2	18
Total Daguao	38
Yabucoa (44 MW total)	
GT 1	0
GT 2	0
Total Yabucoa	0
Aguirre GT-1 y GT-2 (Out of Service) (44 MW total)	0
Vega Baja GT-1 y GT-2 (Out of Service) (44 MW total)	0
Costa Sur GT-1 y GT-2 (Out of Service) (44 MW total)	0
Total Aguirre / Vega Baja / Costa Sur Peaker	0
Total Peaker MW Available	179